#InvestEUresearch

Horizon 2020 Work Programme for Research & Innovation 2018-2020

Upcoming challenges for nanotechnologies, advanced materials, advanced manufacturing & processing, and biotechology

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DG Research & Innovation – Industrial Technologies

Research and Innovation

Strategic Context: Importance of EU Manufacturing

- 64% of private R&D investment
- 2,1 million enterprises (9% of total)
- 32 million jobs (14% of the total + many indirect jobs via related services)
- Turnover : EUR 7,110 trillion
- Manufacturing added value : EUR 2,130 trillion (16% of European GDP)
- Biggest purchaser and user of *Key Enabling Technologies*

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What are the challenges

- (Faster) growth is « elsewhere » - global markets
- Fast growing competitors
- Investments outside EU
- Still good in patenting, less good in turning R&D into innovation and business
- Taking care of the SME landscape, value chains, « eco-systems »
- Bottlenecks in access to financing
- Keeping and developing skills and competences

➔ **How to make industry invest and create jobs in Europe, renew and extend global leadership and generate returns for Europe.**

What are Key Enabling Technologies

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

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

European KET Strategy:

- KETs review by High Level Strategy Group (starting autumn 2017)
- KET High-level Group: final report 'KETs: Time to Act', June 2015
- EC Communications (2009)512 & (2012)341

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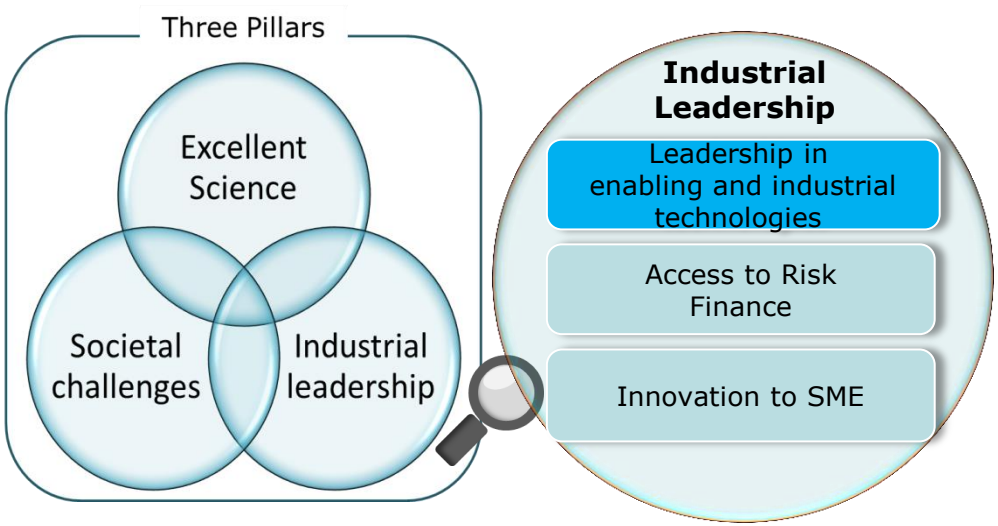
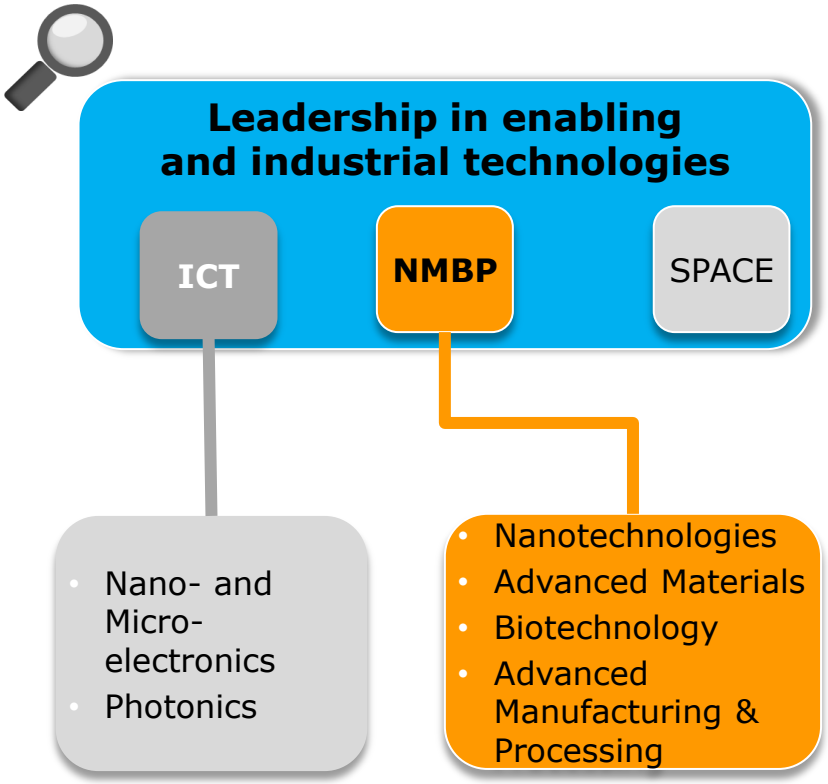
NMBP in Horizon 2020



Indicative budget:
75 billion € *

Indicative Budget:
16.5 billion € *

Out of it for NMBP:
3.8 billion € *



** July 2015 – includes EIT, JRC, "Science with and for Society", "Spreading Excellence / Widening Participation", in addition to three priorities above*

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NMBP in Horizon 2020

Emphasis on:

- R&D and innovation with a strong industrial dimension and in partnership with industry;
    - *Activities primarily developed through relevant industrial roadmaps (ETPs, PPPs)*
    - *Requirements for business cases and exploitation strategies for industrialisation*
- Strengthening industrial capacities including SMEs, including through synergies with other funds (private – public);
    - *Pilot lines and demonstrators, addressing societal challenges*
- Outcome and impact orientation, developing key technology building blocks and bringing them closer to the market:
    - *Technology Readiness Level (TRLs) from 3-4 to 6-7 with emphasis on expected impact;*

➢ Total budget under Horizon 2020: **3.8 billion €**

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Expected Impact

- Technological ambitions, including goals for environmental sustainability, cost reduction, human aspects etc. (see topic descriptions)
- Take-up of results for industrialisation/commercialisation, including upscaling, investments, addressing different markets (preparation through business cases and exploitation strategies for industrialisation)
- Building new test/experimentation/validation infrastructure and services (for SMEs)
- Reach out to new stakeholders (e.g. SMEs) and civil society, citizens; dissemination goals

➔ *Proposal evaluation =>* *Excellence & Impact criteria equally important*
Higher weighting for impact for Innovation Actions!

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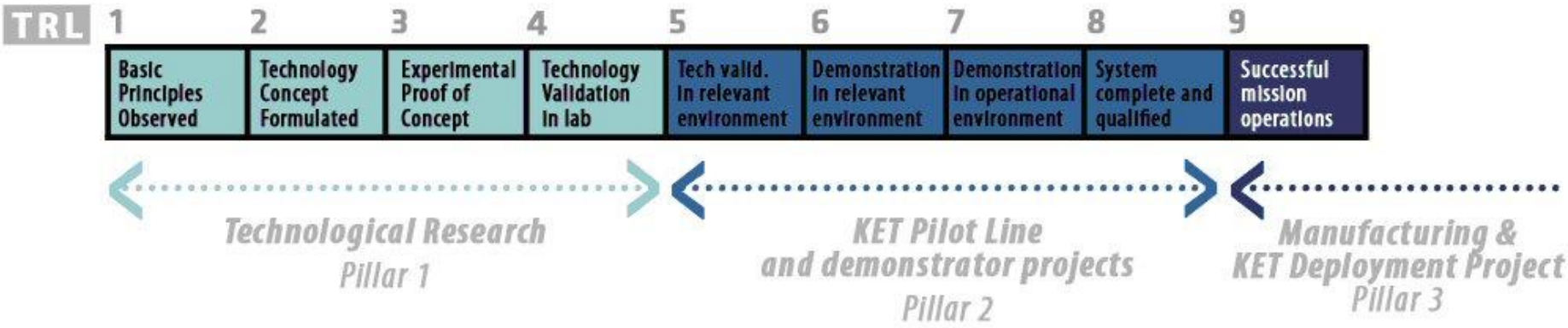
Technology Readiness Levels (TRLs)

- The LEIT part of Horizon 2020 targets TRLs from 3-4 up to 7 with a centre of gravity on 5-6
- Highest TRLs for cases with a strong industrial commitment



- Beyond TRL 7: *explore paths to commercial exploitation, to deploy technologies funded under Horizon 2020*

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Digitising European industry – the importance of data

- **Horizon 2020: Open Data by default!** (with opt-out possibility) – requirements for Data Management Plans
- Industrial/SME Data:
  - ***be aware of data and their value – balance between sharing & protection***
  - ***Data at the heart of the "4th industrial revolution"***
- Policy background: Digital Single Market
  - "Digitising European Industry" (Communication April 2016)
    - *Industrial platforms (e.g. "Connected smart factory")*
    - *Digital Innovation Hubs (for SMEs)*
    - *Skills*
    - *Standards*
  - European Cloud Initiative and European Science Cloud
  - Data Economy, Platform Economy, incl. data ownership & liability questions

Open Innovation Test Beds

EU Investment

- €260m investment in Open Innovation Test Beds for Nanotechnology and Advanced Materials

What are they?

- Physical facilities offering technology access and services to advance from validation in a laboratory (TRL 4) to prototypes in industrial environments (TRL 7)

How many test beds will be funded?

- 20 Test Beds for materials development and upscaling in 6 technology domains
- 4 Test Beds for materials characterisation
- 4 Test Beds for modelling

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Open Innovation Test Beds Technology Domains

- Lightweight nano-enabled multifunctional materials and components
- Safety Testing of Medical Technologies for Health
- Nano-enabled surfaces and membranes
- Bio-based nano-materials and solutions
- Functional materials for building envelopes
- Nano-pharmaceuticals production

Where?

- Located across Europe
- Facilities and services open to any user in the EU, Associated Countries, and the rest of the world

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Interim Evaluation lessons learned

Programme in good position to achieve impact:

- Strong industry participation and relevance
- TRLs up to 7
- Industry relevant demonstrators
- Most projects intending to take results to markets (80% with explicit business case development)
- Contributions to sustainable development (70%) and climate action (35%)

Main concerns:

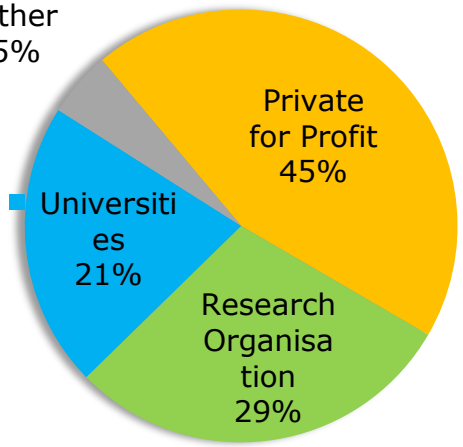
- Oversubscription
- Apparent discontinuity at TRL 1-3
- The funding rates for different types of beneficiaries

2018-2020 : Continuity and novel approaches

- Continued support for **demonstrators** and **pilot lines**
- Extension of concept of **pilot lines for advanced materials and nanotechnology.**
- Support to R&D and **industrial investments** in key enabling technologies.
- More weight for **'fourth industrial revolution**'.
- Oversubscription / underfunding => **fewer topics, more funding per topic**.
- **Lower funding rate (50%) for some topics** for higher industry leverage and larger projects.
- **Greater outreach** : cooperation with other projects, enhanced user involvement, open access.
- Dedicated call for **industrial sustainability** to respond to Climate action and sustainable development targets.

NMBP Participation overview – collaborative R&I

Profile

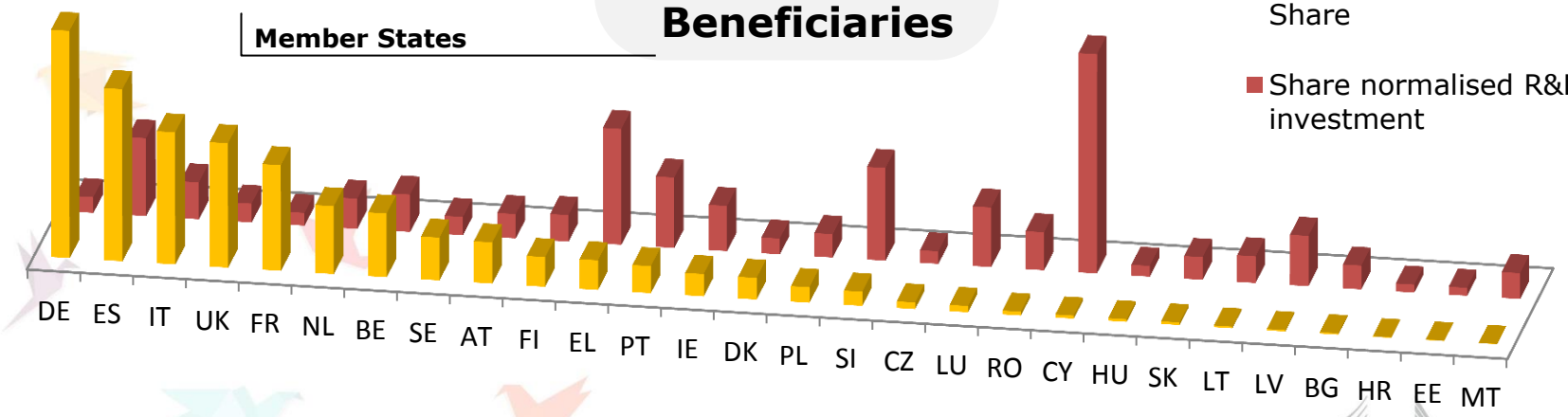


21 % new (not in FP7)
45 % new to NMBP

Newcomers

Beneficiaries

Member States



EC Funding Share

Share normalised R&D investment

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EU-13 Member-States – participation paradox

- Low participation rates in H2020 (very low NMBP)
- Several reasons:
  - Brain drain – weak innovation eco-system
  - Structural funds
  - Lack of experience and confidence
- When participating, then success rates are comparable to EU average
  - but the EU average success rate is low
- Strategic importance to participate in large policy-related H2020 initiatives must be recognised
- Value your strengths
- Strong advise to start networking, joining experienced consortia
- Structural funds are complementary, not a replacement of H2020

NMBP Calls 2018

Publication 31 October 2017

Deadlines

- Two-stage topics: 23/1/18 and 28/6/18
- Single-stage: 22/2/18
- Lump sum funding pilot scheme topic: DT-NMBP-20-2018: 8/3/18
- EU-China flagship initiative on Biotechnology topic: CE-BIOTEC-04-2018 : 25/4/18

Budget

- FOUNDATIONS FOR TOMORROW'S INDUSTRY – 147 M€
- TRANSFORMING EUROPEAN INDUSTRY – 164 M
- INDUSTRIAL SUSTAINABILITY – 211.5 M€

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Opportunities in the Call 2018-2019 – Open Innovation Test beds

Topic Title	Year	Type
Upscaling of nano-enabled lightweight multifunctional materials and components	2018	IA
Upscaling of safety testing in MedTech	2018	IA
Open Innovation Characterisation TB	2018	IA
Upscaling of nano-enabled surfaces and membranes (IA)	2019	IA

Opportunities in the Call 2018-2019 - FoF

Topic Title	Year	Type
Skills needed for new Manufacturing jobs (CSA)	2018	CSA
Effective Industrial Human-Robot Collaboration (RIA)	2018	RIA
Innovative manufacturing of opto-electrical parts (RIA)	2018	RIA
Pilot lines for metal Additive Manufacturing (IA 50%)	2018	IA
Open Innovation for collaborative production engineering (IA)	2019	IA
Refurbishment and re-manufacturing of large industrial equipment (IA)	2019	IA
Pilot lines for modular factories (IA 50%)	2019	IA
Handling systems for flexible materials (RIA)	2019	RIA
A digital 'plug and produce' online equipment platform for manufacturing (IA)	2018	IA
ICT Topics 2018	2018	
ICT Topics 2019	2019	

Opportunities in the Call 2018-2019 - EeB

Topic Title	Year	Type
Building Information modelling adapted to efficient renovation	2018	RIA
ICT enabled, sustainable & affordable residential building construction	2018	IA 50%
Integration of energy smart materials in non-residential buildings	2019	IA
New developments in plus energy houses	2019	IA
Integrated storage systems for residential buildings	2019	IA
Decarbonisation of the EU building stock	2018-2019-2020	
Next-generation of Energy Performance Assessment and Certification	2018-2019-2020	
Upgrading smartness of existing buildings through innovations for legacy equipment-	2019-2020	

Opportunities in the Call 2018-2019
SPIRE and Catalysing the Circular Economy

Topic Title	Year	Type
Processing of material feedstock using non-conventional energy sources	2018	IA
Energy and resource flexibility in highly energy intensive industries	2018	IA 50%
Efficient integrated downstream processes	2019	IA
Adaptation to variable feedstock through retrofitting	2019	IA 50%
Digital technologies for improved performance in cognitive production plants	2019	IA
Efficient recycling processes for plastic containing materials	2018	IA
Catalytic transformation of hydrocarbons	2018	RIA
Photocatalytic synthesis	2019	RIA
Smart plastic materials with intrinsic recycling properties by design	2018	RIA
SC3 – Energy:		
Conversion of captured CO2	*2018*	*RIA*
Solar Energy in Industrial Processes	*2019*	*RIA*
Business case for industrial waste heat/cold recovery	*2018*	*IA*
Business case for industrial waste heat/cold recovery	*2019*	*CSA*
SC5 – Climate action, environment, resource efficiency and raw materials:		
Methods to remove hazardous substances and contaminants from secondary raw materials	*2018*	
Building a water-smart economy and society	*2019*	

Opportunities in the Call 2018-2019 Biotechnologies and Health related

Topic Title	Year	Type
Standardisation in Synthetic Biology	2018	CSA
Boosting the efficiency of photosynthesis	2019	RIA
Synthetic biology to expand diversity of nature's chemical production	2018	RIA
New biotechnologies for environmental remediation	2018	RIA
Microorganism communities for plastics bio-degradation	2019	RIA
Osteoarticular tissues regeneration	2018	RIA

Opportunities in the Call 2018-2019
Clean energy through innovative materials

Topic Title	Year	Type
Strengthening EU materials technologies for non-automotive battery storage	2018	IA
Materials for non-battery based energy storage	2019	RIA
Materials for future highly performant electrified vehicle batteries	2018	RIA
Smart materials, systems and structures for energy harvesting	2019	RIA

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Opportunities in the Call 2018-2019
Modelling and Characterisation

Topic Title	Year	Type
Accelerating the uptake of materials modelling software	2018	RIA
Real-time nano-characterisation technologies	2019	RIA
Translation of manufacturing problems into materials modelling	2018	RIA

Opportunities in the Call 2018-2019
Safety and Regulatory

Topic Title	Year	Type
Risk Governance nanotechnology	2018	RIA
Nano-informatics: from materials models to predictive (eco)toxicology	2018	RIA
Safe by design, from science to regulation: metrics and main sectors	2018	RIA

Further information

Horizon 2020: http://ec.europa.eu/research/horizon2020/index_en.cfm

Key Enabling Technologies, R&I website :
http://ec.europa.eu/research/industrial_technologies/index_en.cfm

Participant Portal - Funding Opportunities and support services :
http://ec.europa.eu/research/participants/portal/desktop/en/home.html

National Contact Points in your country (NMP)
http://ec.europa.eu/research/participants/portal/desktop/en/support/national_contact_points.html#c,contact=country/sbg//1/1/0&+person.last_name/desc

National Contact Points website - webinars, presentations, guidance :
http://www.nmpteam.eu/

Research Enquiry Service: http://ec.europa.eu/research/index.cfm?pg=enquiries

CORDIS database with EU funded research projects :
http://cordis.europa.eu/projects/home_en.html

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Thank you!

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