



Industry 4.0 in EU Framework Programmes

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19th Century – the First Industrial Revolution



*21st Century
– the Fourth /
Fifth
Industrial
Revolutions*

Fourth Industrial Revolution

- Overcomes borders between physical, digital and biological worlds
- Exponential pace
- Disruptive for industry
- Impacts on life and society
 - *Klaus Schwab: We live in a time of great promise and great peril*

Fourth Industrial Revolution – the Potential and the Risks

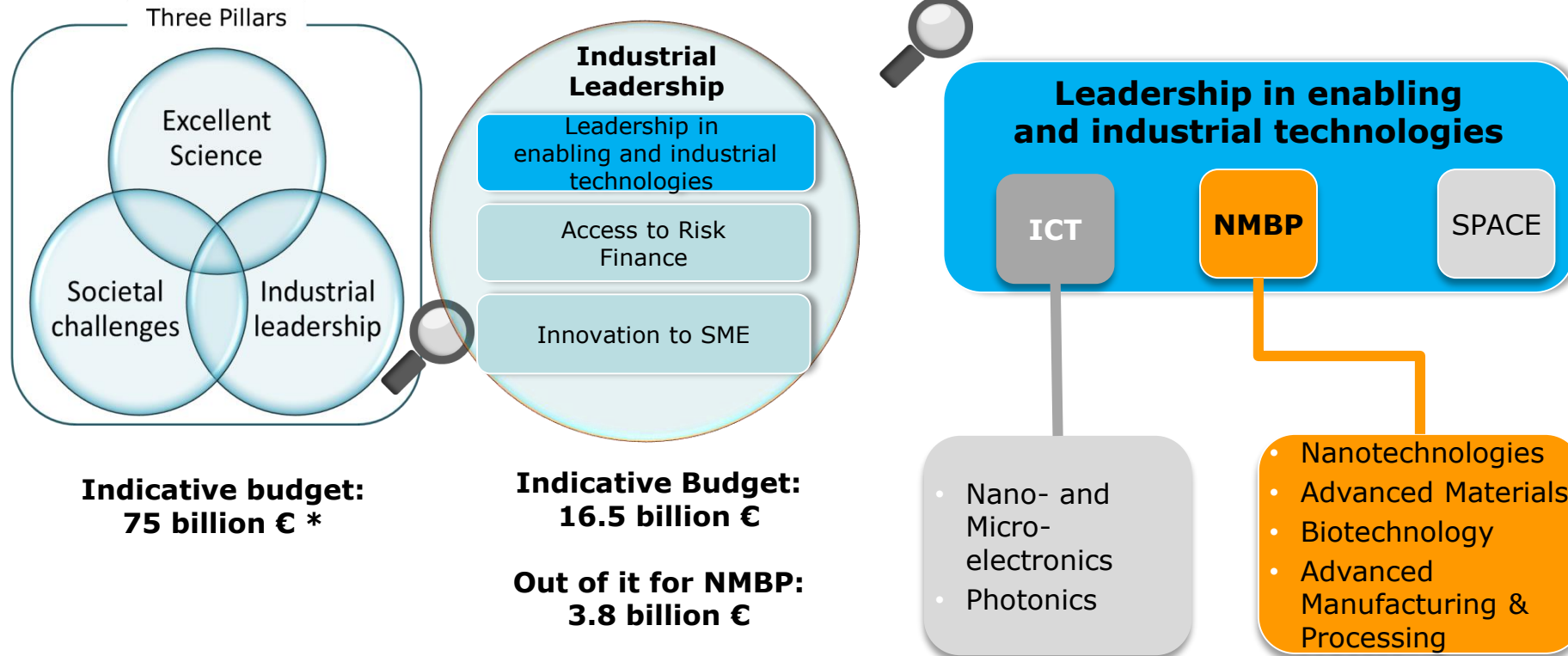
- Access to vast range of knowledge and services
- Flexible Production
- Localised, sustainable production
- Opportunities for better jobs
- Adapting to the rapid transformation
- Impact on jobs and people
- Can new jobs compensate for loss of old jobs?
- Ethics, taxation, ...

Fourth Industrial Revolution

– the EU Approach

- Strengthen technology base and innovation capacity of industry
- Industry provides 20% of jobs, generates 80% of exports and is the primary source of private R&D
- *Digitising European Industry* Initiative, April 2016
- Digital Innovation Hubs, updating digital regulatory framework
- Horizon 2020 (KETs, NMBP programme, cPPPs)
- Horizon Europe (EIC, European Partnerships, 15 bn for cluster « digital, industry and space »)

KETs - NMBP in Horizon 2020



LEIT - NMBP part of 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);
 - *Cross-cutting KETs, including 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;*

Public Private Partnerships (PPPs)

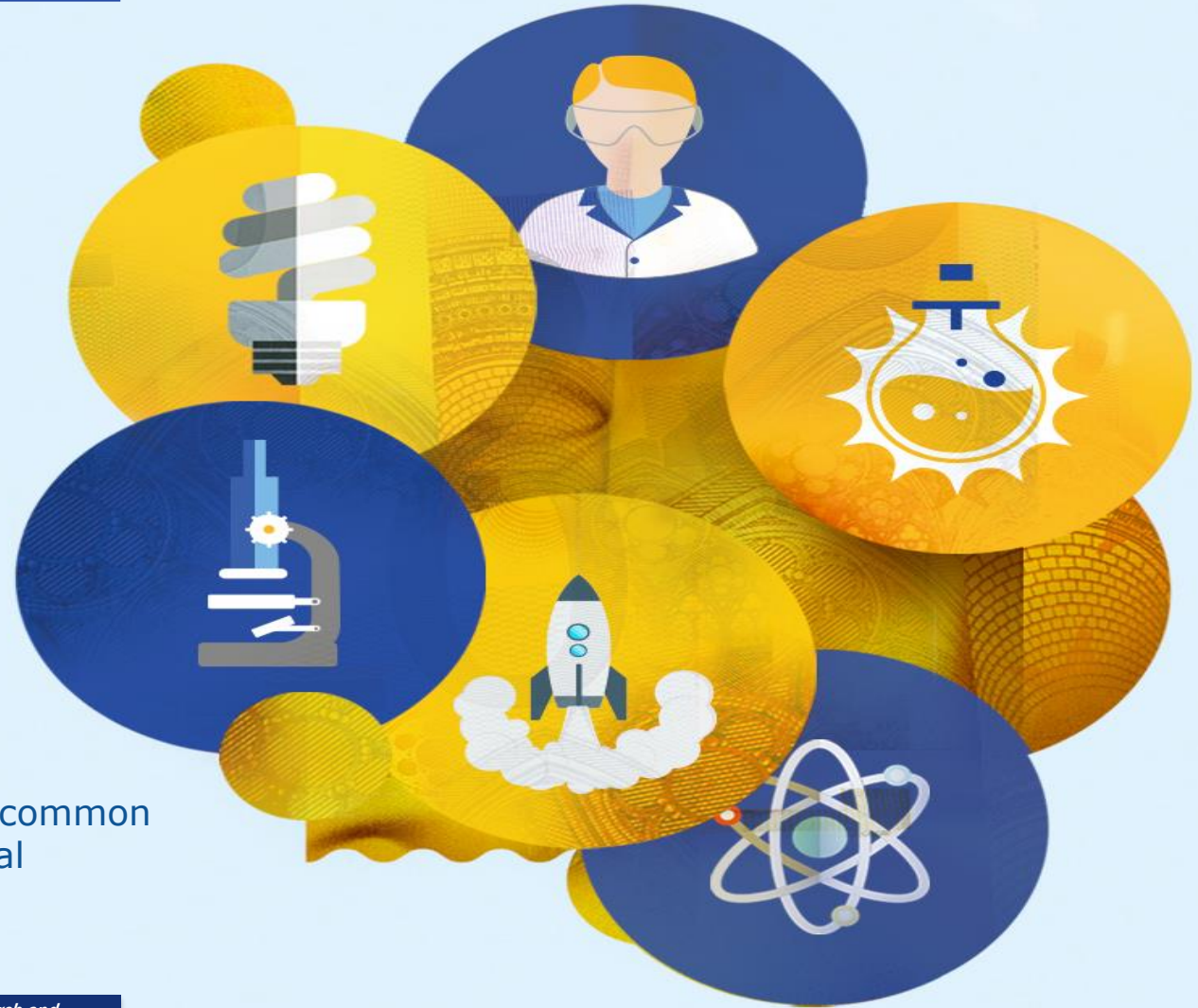
- **Industry** plays a **leading role** in defining research priorities
- **Pre-defined budget** ensures continuity and commitment
- Focused on **enabling industrial technologies**
- Increased use of **SME-friendly** instruments and **demonstration**
- Roadmaps prepared with large stakeholder involvement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

Horizon Europe

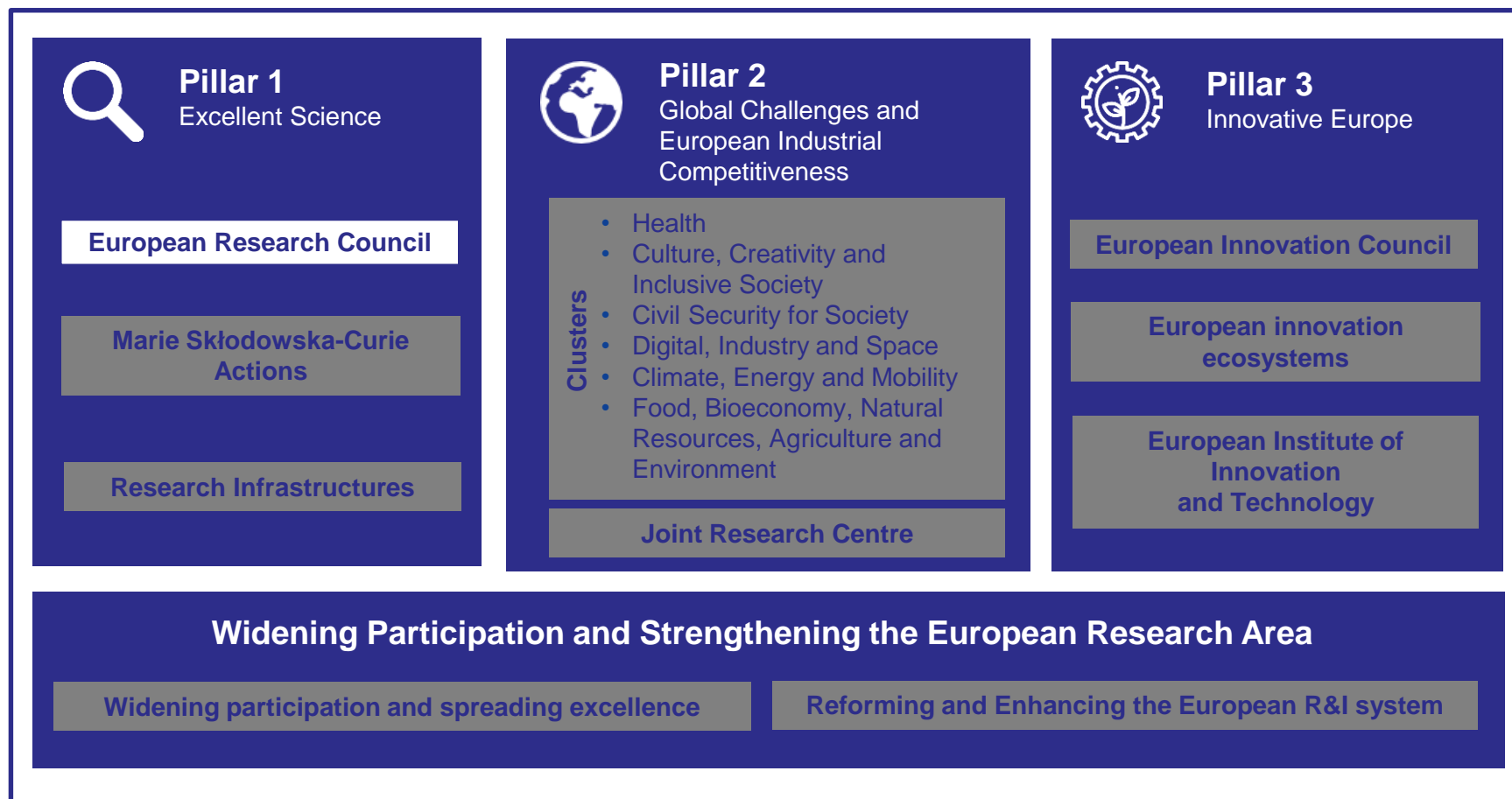
THE NEXT EU RESEARCH & INNOVATION INVESTMENT
PROGRAMME (2021 – 2027)

#HorizonEU

Based on the Commission Proposal for Horizon Europe, the common understanding between co-legislators and the Partial General Approach, both approved in April 2019



Horizon Europe: Preliminary structure





European Innovation Council

Support to innovations with breakthrough and disruptive nature and scale up potential that are too risky for private investors
(70% of the budget earmarked for SMEs)

European Innovation
Council – a one-
stop-shop

Helping innovators create markets of the future, leverage private finance, scale up their companies, Innovation centric, risk taking & agile, pro-active management and follow up

Two complementary instruments bridging the gap from idea to investable project

Pathfinder: grants
(from early technology
to pre-commercial)

Accelerator:
grants only & blended finance
(from pre-commercial
to market & scale-up)



European
Commission

New approach to European Partnerships

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key features

- **Simple architecture and toolbox**
- **Coherent life-cycle approach**
- **Strategic orientation**

Co-programmed

Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by Horizon Europe

Co-funded

Based on a joint programme agreed and implemented by partners; commitment of partners for financial and in-kind contributions

Institutionalised

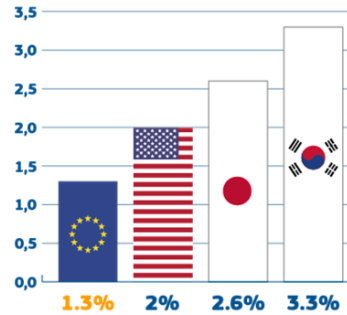
Based on long-term dimension and need for high integration; partnerships based on Articles 185 / 187 of TFEU and the EIT-Regulation supported by



Cluster 4 Digital, Industry and Space: Priorities

- Reshaping economies and societies through key enabling technologies (KETs) and digital transformation
 - **for autonomy and leadership; and**
 - **for addressing global challenges**
- Industry producing in Europe / Human centred ecosystem
- Industry reducing green-house gas emissions
- Industrially-oriented infrastructures (KETs / digital)
- Use of enabling, digital and space technologies
- Generation and valorisation of big data
- "... by design" / Life Cycle Analysis

Challenges addressed by Cluster 4



- **EU industry faces global competition and its autonomy is compromised**

- business R&D lower in EU than US, S Korea, Japan
- R&D share in high-tech sectors lower in EU

- **Planetary boundaries require a fundamental transformation**

- to cope with scarce resources, incl. energy
- to reduce greenhouse gas emissions



- **Growing social inequalities**

- disparities in investments, technological specialisation
- impact of digitisation / artificial intelligence / future of work
- concerns about new technologies

Cluster 4 Digital, Industry and Space: what?

10 intervention areas:

- Manufacturing technologies
- Key digital technologies
- Emerging Enabling Technologies
- Advanced materials
- Artificial intelligence and robotics
- Next generation internet
- Advanced computing and big data
- Circular industries
- Low carbon and clean industries
- Space

Cluster 4 Digital, Industry and Space: how will it link to other EU programmes?

- The Digital Europe Programme (DEP) will use public procurement to deploy the digital technologies and infrastructures (in particular in artificial intelligence, cybersecurity and high-performance computing)
- The European Space programme will feed R&I priorities into this cluster, will pick up results for applications in e.g. agriculture, climate monitoring
- The InvestEU Fund can finance innovators and innovations coming from this cluster, to enable their roll-out and scale-up
- The European Regional Development Fund (ERDF) may support the take-up of results emerging from this cluster
- The Connecting Europe Facility (CEF) supports the large-scale roll-out and deployment of innovative new technologies and solutions in transport, energy and digital-physical infrastructures
- The Single Market Programme will support the competitiveness of SMEs and entrepreneurship (e.g. Enterprise Europe Network)



Have your say on Horizon Europe!

- Public consultation on future objectives for EU-funded research and innovation (open till 4 October 2019)

https://ec.europa.eu/eusurvey/runner/HorizonEurope_Codesign_2021-2024

Further information Horizon 2020

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>

NMBP Work Programme :

http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-leit-nmp_en.pdf

http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-focus_en.pdf (cross-cutting - focus areas)

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

Research and Innovation

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