New Opportunities: EU 2021-2027 R&I Programmes

NFTPs Meeting, Brussels 3 October 2018
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ENEA
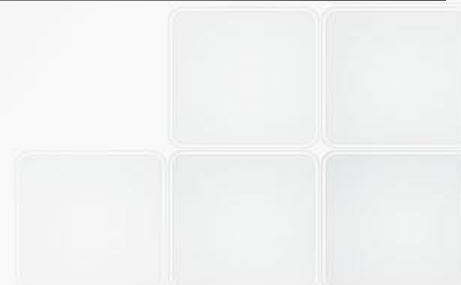
WHAT?

bottom up / top down

industrial leadership

excellence *versus* widening

incremental and/or breakthrough & disruptive innovation

strategic planning

SDGs

R&I Missions

co-creation, co-design

European Partnerships

grants / blending

synergies

Horizon Europe: structure & budget (proposal)

Pillar I: Open Science 25.8 bn€

European Research Council (ERC)

Marie Skłodowska-Curie Actions

Research Infrastructures

Pillar II: Global Challenges and Industrial Competitiveness 52.7 bn€ (including 2.2 bn€ EURATOM

Health

Inclusive and Secure Societies

Digital and Industry

Climate, Energy and Mobility

Food and Natural Resources

Joint Research Centre

Pillar III: Open Innovation 13.5 bn€

European Innovation Council

Innovation ecosystems

European Institute of Innovation & Technology (EIT)

Strengthening the European Research Area 2.4 bn€

Sharing Excellence

Reforming and Enhancing the EU Research and Innovation System

Source: European Commission

- ➢ **100 bn€?** -3.5 InvestEU – 2.4 Euratom = **94.1 bn€**
- ➢ **Current Price:** with an inflation rate > 2%/year?
- ➢ **C**ommitments

ENEA
AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE,
L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

Comparison HEU – H2020

HORIZON EUROPE	Budget in current prices (B€)	%	HORIZON 2020	Budget in current prices (B€)	%	HEU ≠ H2020
TOT	94.1	-	TOT	77	-	+22.2%
PILLAR 1 – Open Science	**25.8**	**27.4%**	**PILLAR 1 - £xc. Science**	**21.7 (no FET 2.7)**	**28.2%**	+18.9%
ERC	16.6	17.6%	ERC	13.1	17%	+26.7%
MSCA	6.8	7.2%	MSCA	6.1	7.9%	+11.5%
RIs	2.4	2.6%	RIs	2.5	3.2%	-4%
PILLAR 2 – Global Challenges & Industrial Competitiveness	**50.5 (+ 2.2/JRC)**	**53.6% (56%)**	**PILLAR 3 (Societal Challenges) + LEIT**	**43 (+1.9/JRC)**	**58.3% 55.8% (58.3%)**	+17.4
Health	7.7	8.2%	Health (SC1)	7.5	9.7%	+2.7%+
Inclusive & Secure Societies	2.8	3%	SC6 + SC7 (+SwafS)	3	3.9%	-6.7%
Digital & Industry	15	15.9%	LEIT	13.3	17.3%	+12.8%
Climate[1], Energy, Mobility	15	15.9%	SC3 + SC4 (+ part SC5)	15.3	19.9%	-2%
Food & Natural Resources	10	10.6%	SC2 (+ part SC5)	3.9	5.1%	+156.4%
JRC	2.2	2.3%	JRC	1.9	2.5%	+15.8%
PILLAR 3 – Open Innovation	**13.5**	**14.3%**				
EIC	10.5[2]	11.2%	FET + ARF + Inno in SMEs	6.1	7.9%	na
EIT	3	3.2%	EIT	2.7	3.5%	+11.1%
Strenghtening the ERA	**2.1**	**2.2%**	SEWP	0.8	1%	+162.5%
Sharing Excellence (Teaming, Twinning, ERA Chairs, COST)	1.7	1.8%				
Reforming & enhancing the EU R&I system (Open Science, Policy Support Facility...)	0.4	0.4%				

Source: APRE, ENEA

Target of a min. % of the budget to SMEs?

% of the budget to support KETs?

[1] **Target**: 25% MFF budget to climate objectives across ALL EU programmes
[2] 10€ EIC: 0.5€ Ecosystems

Key novelties (...)

Support breakthrough innovation ➡️ **European Innovation Council**

Create more impact through mission-orientation and citizens' involvement ➡️ **R&I Missions**

More impact

Strengthen international cooperation ➡️ **Extended openness to association and international cooperation**

Reinforce openness ➡️ **Open science policy**

Rationalise the funding landscape ➡️ **New approach to Partnerships**

More Openness

Source: European Commission

Global Challenges & Industrial Competitiveness
(boosting key technologies and solutions underpinning EU policies &SDGs)

Clusters	Implemented through usual calls, missions & partnerships	Budget (€ billion)
Health	Health throughout the life course; Environmental and social health determinants; Non-communicable and rare diseases; Infectious diseases; Tools, technologies and digital solutions for health and care; Health care systems	€ 7.7
Inclusive and Secure Societies	Democracy; Cultural heritage; Social and economic transformations; Disaster-resilient societies; Protection and Security; Cybersecurity	€ 2.8
Digital and Industry	Manufacturing technologies; Digital technologies; Advanced materials; Artificial intelligence and robotics; Next generation internet; High performance computing and Big Data; Circular industries; Low carbon and clean industry; Space	€ 15
Climate, Energy and Mobility	Climate science and solutions; Energy supply; Energy systems and grids; Buildings and industrial facilities in energy transition; Communities and cities; Industrial competitiveness in transport; Clean transport and mobility; Smart mobility; Energy storage	€ 15
Food and Natural Resources	Environmental observation; Biodiversity and natural capital; Agriculture, forestry and rural areas; Sea and oceans; Food systems; Bio-based innovation systems; Circular systems	€ 10
Joint Research Centre	**supports European policies with independent scientific evidence and technical support throughout the policy cycle**	2021-27 € 2.2

From grand challenges to missions

5 key criteria for selecting Missions

- Bold, inspirational with wide societal relevance
- A clear direction: targeted, measurable and time-bound
- Ambitious but realistic R&I actions
- Cross disciplinary, cross-sectorial and cross-actor innovation
- Multiple bottom-up solutions

NO separate budget for missions "There will not be a separate budget for missions, though missions will have a budget assigned through the work programme. Missions […] receive their budget from more than one cluster".

Strategic planning

multiannual WPs + call for proposals + missions + partnerships

Objectives: Transparency and stakeholder involvement; impact maximisation; prioritisation; internal programme coherence; synergies with other programmes

Multiannual Strategic R&I Plan

* Multiannual orientations and priorities in one document

* Areas for partnerships and missions

Strategic discussions with Member States and European Parliament

Consultation with stakeholders

Work Programmes

EIC: Pathfinder, Accelerator

Two main instruments ....   **.... aiming at ....**   **.... implemented by**

Making Europe the world leader in breakthrough / market creating innovation (EIC)

The EIC Pathfinder

- **Strengthening the emergence and development of breakthrough science/technology leading to breakthrough / market-creating innovation**

- Research and innovation project (usually from TRL 2/3)
- Competitive call for proposals with a bottom-up approach (completed by top-down Inducement Prizes)
- Carried out by a **Single Innovator** (possibly working with a consortium)
- Any legal entity (e.g. University, research organisation, Start-up, SME, Midcap, Corporate, etc)
- Grants (up to (€5) million)
- Outcome: a start-up, a robust business plan based on a breakthrough technology to be implemented by an entreprise (from start-up/spin-off to Midcaps)

The EIC Accelerator

- Accelerating and accompanying the scale-up of entreprises carrying-out breakthrough market-creating innovation

- Development project (usually from TRL 5/6)
- Open call / first-come, first-assessed, first served approach. Direct access for start-ups emerging from the Pathfinder, ERC Proof of Concept, EIT KICs, Global Challenges projects, etc ...
- Bottom-up approach
- Single beneficiary
- Entreprises: start-ups, SMEs, Midcaps
- Direct blended finance (tailor-made mix of grants, debt, equity (from seed to mezzanine bridge))
- Up to (€30) million, possibly in several instalments (milestones)
- Equity finance : co-financing; except strategic reason (i.e. Security)

Nota bene: A beneficiary of the EIC Pathfinder or of the EIC Accelerator may be included in the portfolio of projects of a Global Challenges Mission

Executive European Agency for Disruptive Innovation ("possibly revamped" EASME)

Grants only

Partnership with other actors (e.g. private investors (VCs, banks, ...), public innovation bodies, etc ...)

Debt / equity

The Funding Agents for breakthrough Science, Technology and Innovation in Europe of the EIC (EIC FASTIEs)

Partnerships: how many?

Partnership approaches	Public-public partnerships (P2P)	Public-private partnerships (PPP)	EIT-KICs*	FET Flagships**
Implementation modes	ERA-NET-Cofund, EJP Cofund, Article 185, Joint Programming Initiative (JPI)	Contractual Arrangement (cPPP) Article 187	H2020 Grant agreements for different types of actions Framework Partnership Agreements (FPA)	
Currently active R&I Partnerships (Horizon 2020)	a) ERA-NETs: ~70 b) EJP Cofund: 5 c) Article 185: 6 d) JPIs: 10	a) JUs: 7 (+HPC) b) cPPPs: 10	a) KICs: 6	a) FET-Flagships: 2 (+Quantum)
Financial contribution from H2020, estimated)	2.500 MC (3,1% of H2020 budget)	13.450 MC (17,5% of H2020 budget)	2.400 MC (3,1% of H2020 budget)	1.000 MC (1,3% of H2020 budget)

Horizon 2020 — Member States — Advisory Structures

BUDGET RESPONSIBILITY: 8 Commission Directorates General (DG) & JRC

WORK PROGRAMME DEFINITION: JTI | Art. 185 | EIT | JRC | ERC | 8 Commission Directorates General | JPI | ETP / cPPPs / EIP

IMPLEMENTATION: JU | DIS | KIC | JRC Centers | ERCEA | EIB | Executive Agencies (INEA, REA, EASME) | DGs (RTD, CNECT, HOME, GROWTH) | Framework Partnership Agreement | ERA-NET | National RFO

Legend:
- Horizon 2020 funding
- Member State funding
- Private funding
- Mixture of funding (other EU funds, national funds, regional funds and/or private funds)
- Secondary source of funding

PPPs in H2020

Joint Technology Initiatives	Contractual PPPs
• Innovative Medicines Initiative (IMI2)	• Factory of the Future (FoF)
• Clean Sky2	• Energy Efficient Buildings (EeB)
• Fuel Cell and Hydrogen (FCH2)	• Green Vehicles (EGVI)
• Single European Sky ATM Research (SESAR)	• 5G for Future Internet (FI-PPP)
• Electronic Components and Systems (ECSEL - ARTEMIS + ENIAC)	• Sustainable Process Industry though Resources and Energy Efficiency (SPIRE)
• Bio-based Industries (BBI)	• Photonics
• Shift2Rail (S2R)	• Robotics
	• High Performance Computing
	• Big Data

Efficiency cPPPs

Openness, inclusion and transparency

	5G	Big Data	EeB	EGVI	FoF	HPC	Photonics	Robotics	SPIRE
% of non-members in the participations (beneficiary count)	71	78	75	67	77	62	80	58	73
% of EU funding to non-members	60	71	70	53	77	60	71	46	71
% of SMEs in participations (partner count)	>17	>25	>33	>15	>35	>11	>28	>18	>27

Relevance beneficiaries

	FP7	Horizon 2020	5G	Big Data	EeB	EGVI	FoF	HPC	Photonics	Robotics[12]	SPIRE
% of funds to private for-profit (PRC)	25%	28%	63%	46%	53%	62%	53%	26%	44%	26%	50%
% of funds to SMEs	15%	24%	16%	19%	31%	11%	30%	13%	26%	10%	26%
% of funds to top 10 beneficiaries	8%	10%	25%	31%	14%	28%	15%	32%	25%	21%	15%
% of funds to top 50 beneficiaries	20%	22%	65%	64%	37%	58%	35%	69%	50%	56%	36%
% to top 5 countries	58%	58%	70%	66%	62%	74%	67%	74%	62%	70%	57%
% funding to EU13	4%	4%	2%	5%	9%	3%	4%	3%	4%	3%	5%

Performance

	Average time to grant (days)	Average quality rate (%) - proposals above threshold/eligible proposals	Average success rate (%) - funded projects/eligible proposals for funding
FP7	313	45.3%	16.8%
Horizon 2020	233	45.0%	11.0%
5G	203	52.5%	23.8%
Big Data	200	50.0%	17.0%
EeB	198	22.6%	12.1%
EGVI	219	41.4%	19.9%
FoF	205	25.0%	12.4%
HPC	219	66.7%	29.7%
Photonics	218	59.7%	19.5%
Robotics	216	39.4%	10.1%
SPIRE	205	19.2%	8.6%

Source: P. Annunziato, 2017

Partnerships for societal challenges (H2020)

- **Joint Programming Initiatives (JPI)**

  European Research Area Joint Programming

- **Neurodegenerative diseases/Alzheimer's** (JPND) - FR — 2008

- **Agriculture, Food Security & Climate Change** (FACCE) – UK, FR
- **Healthy diet for a healthy life** (HDHL) – NL
- **Cultural Heritage & Gobal Change** (CH) – IT
- **Ageing** (More years, better life) (MYBL) – DE — 2009

- **Water challenges for a changing world** (Water) – ES, FR
- **Healthy and productive seas and oceans** (Oceans) – NO, ES, BE
- **Climate change** (Climate) – DE
- **Antimicrobial resistance** (AMR) –SE, IT
- **Urban Europe** – AT, NL — 2010

- **European Innovation Partnerships (EIP)**

  Supply → ← Demand

- **Active and Healthy Ageing** (AHA)
- **Raw Materials** (RM)
- **Water Efficient Europe** (Water)
- **Agricultural Productivity and Sustainability** (AGRI)
- **Smart Cities and Communities** (SCC)
- **Smart mobility**

P2P networks in food (example)

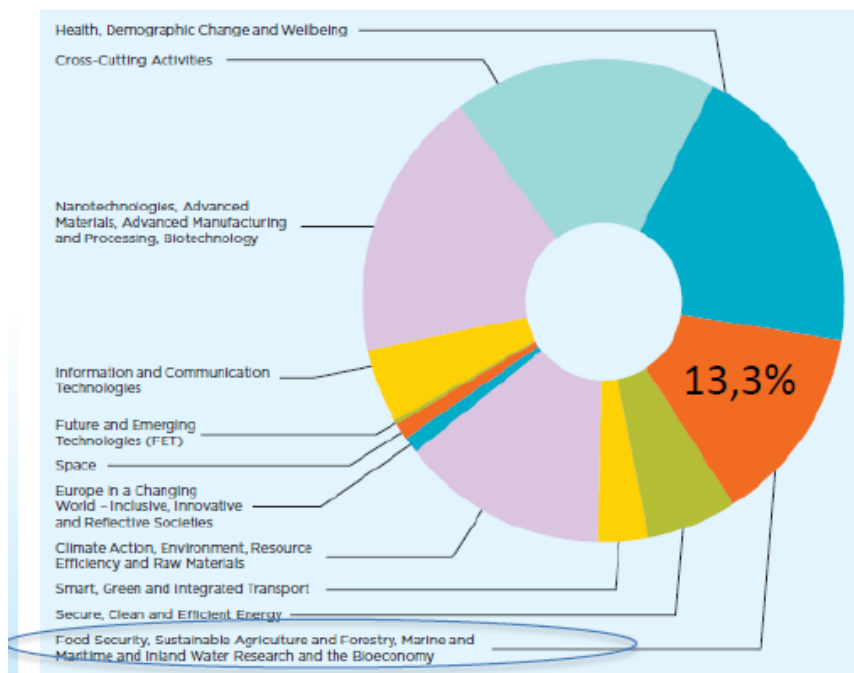Example: Data on P2P Networks in the Food, Agriculture, Bioeconomy Theme

https://www.era-learn.eu/
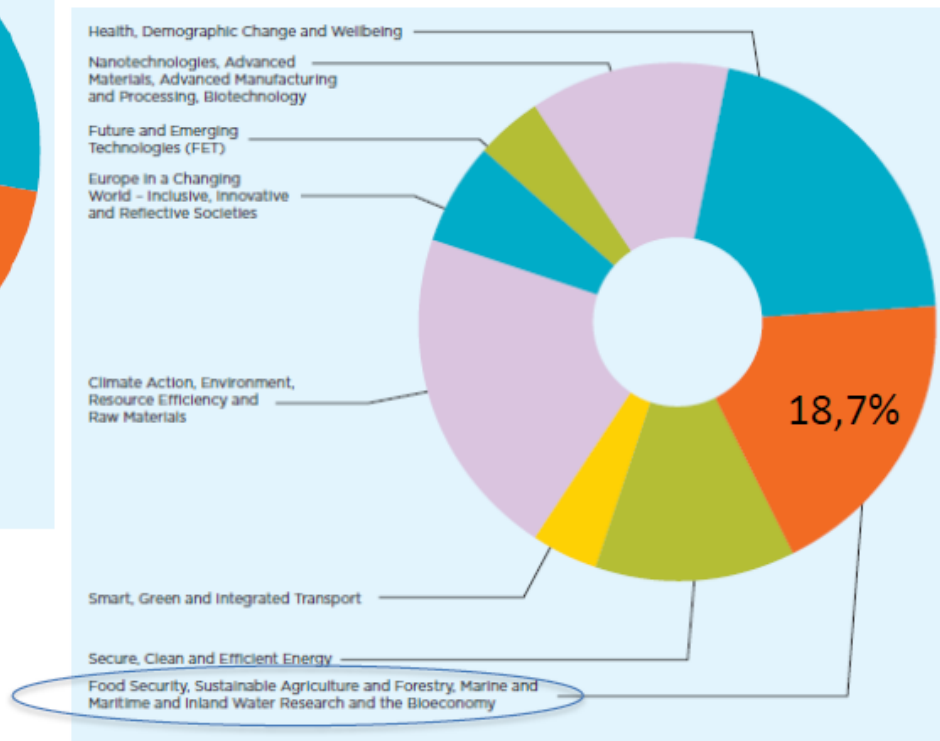
New approach to European Partnerships

Partnerships with public or private sector partners can achieve certain Horizon Europe objectives more effectively than the Union alone. A new generation of **objective-driven** and more ambitious partnerships in support of agreed EU policy objectives are planned to be set up.

Key features

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

Co-programmed
Based on MoUs / contractual arrangements; implemented independently by the partners and by Horizon Europe

Replace cPPP?

Co-funded
Joint programme agreed by partners; commitment of partners for financial and in-kind contributions and integration of activities; Horizon Europe makes a financial contribution

Replace ERA-NETs, JP?

Institutional
Based on long-term dimension and need for high integration, partnerships based on Articles 185 / 187 of the TFEU and the EIT-Regulation will be set-up and supported by Horizon Europe

Synergies with other Programmes

Horizon Europe

Other Union Programmes

CAP CEF Erasmus+

ESIF Digital Europe Innovation fund

External instrument Internal Security Fund & Integrated Border Management Fund

Instrument for pre-Accession Assistance Life+

InvestEU Single Market Programme

Space Programme

Enhanced synergies

Compatibility
Harmonisation of funding rules; flexible co-funding schemes; pooling resources at EU level

Complementarity
No overlap in funding

Coherence
Alignment of strategic priorities in support of a common vision

Towards Horizon Europe

July 2018   January 2019   July 2019   January 2020   July 2020   January 2021

BREXIT   EU Elections   New European Commission   German Presidency of the Council

Council Reaction (Partial General Approach?)
(Nov 2018)

MFF / Horizon Europe negotiations
(Parliament + Council)

?

MFF / Horizon Europe negotiations
(NEW Parliament + Council)

Horizon Europe
APPROVED

Commission Proposal
(June 2018)

Vote in ITRE Committee
(Nov 2018)

Trilogue?
(Jan-Mar 2019)

Horizon Europe Strategic Planning process

Strategic Plan
ADOPTED

First strategic discussions on Missions and Partnerships
- EC + Member States + Parliament (2nd semester 2018)

Open Consultation
(1st Semester 2019?)

Horizon 2020
Work Programme 2020
Preparation

Horizon 2020
2020 WP
ADOPTED

Horizon Europe - Work Programme Preparation
(Shadow Programme Committee?)

Horizon Europe
2021-22 WP
ADOPTED

June 2019

WP 2021-22 Preparation
(1st and 2nd Semester 2020)

Timeline (EP, CEU)

- EP 10/10 – Second Shadow Meeting
- EP 15/10 - Deadline input from groups on compromise amendments
- CEU 15/10 – informal Competitiveness Council (Missions?)
- EP 18/10 – Third Shadow Meeting
- EP 23/10 – Forth Shadow meeting
- EP 13/11 – Final Shadow Meeting
- **EP 13/11 –Final vote on EU budget / MFF (plenary)**
- EP 14/11 – Figures MFF in HE (plenary 13.11)
- **EP 21/11 – Final vote ITRE on Horizon Europe**
- **EP 28-29/11 – Vote in plenary on HE (mandate confirmed)**
- CEU 30/11 - Competitiveness Council, PGA?

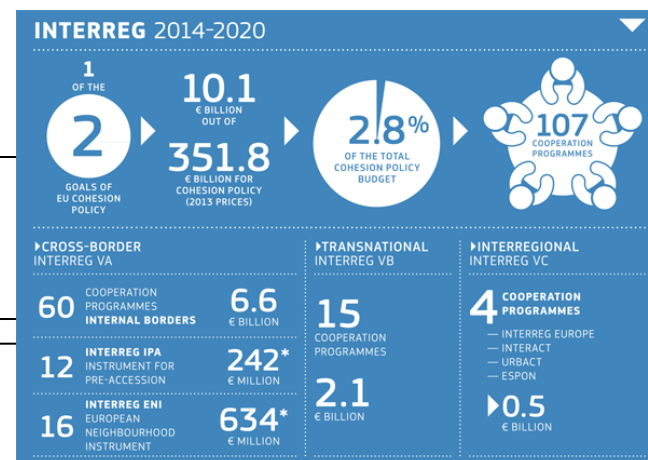# Other opportunities <u>beyond</u> the FP

Bottom-up

DG AGRI, DG CLIMA, DG GROW, DG MARE, DG RTD, DG SANTE.....

European Territorial cooperation

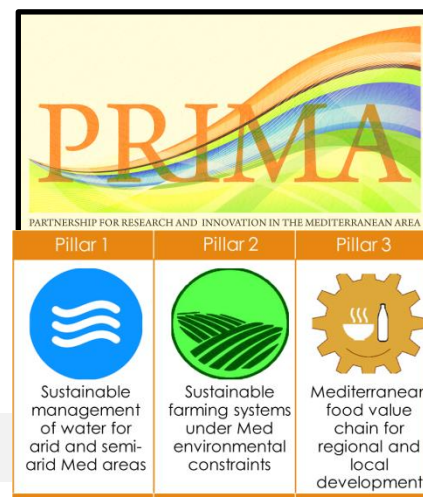*Cross-border, Transnational, Interregional*

Call for proposals / Calls for tender

International Cooperation

EuropeAid

ACP Science and Technology, *etc...........................*

Innovation…?