



Hydrogen Europe

Research

# HYDROGEN EUROPE RESEARCH

Policy Working Group 8/04/2021

# Agenda

10:00 – 10:05 – Welcome & Approval of the agenda

10:05 – 10:20 – Subgroups updates

*“Communication” paper*

*Technical paper*

10:20 – 10:35 – Follow-up from the last meeting

*Code of conduct for recruitment*

*Research & Technology infrastructures*

10:35 – 11:15 – Latest updates on EU news

*Launch of Open Research Europe*

*Hydrogen and decarbonised gas market package*

*RED II: Debate on the scope of the revision*

*EU Taxonomy*

*Focus on Horizon Europe*

11:15 – 11:30 – Additional points of discussion

# Updates on the Subgroups

# Updates on Subgroups

## **Communication paper:**

- Paper consolidated & recommendations (3) finalised.
- Ongoing development of a visual leaflet presenting the association and its “successes” – graphs and diagrams to be inserted in the communication paper.
- Discussions regarding the organisation of an event (see next slide).

## **Technical paper:**

- Identification of key research areas – 3 inputs received.
  - We are not writing a SRIA: prioritisation needed (see next slides).
- Meeting planned on 9/04.

# Updates on Subgroups – Communication Paper

## Considering that:

- Our recommendations are general and do not reply to an ongoing legislative discussion.
- It is better to directly reach out to policy makers to build personal relations with them.

## It was proposed:

- To broadcast a visual leaflet via social media.
  - To organise an event inviting specifically policy makers to present our general policy recommendations (later in person or soon via webinar).
- ✓ **Communication paper will be shared with the Policy WG once finalised.**

# Updates on Subgroups – Technical Paper

- Current list of key research areas is long – we need to build on the SRIA and identify areas of research that have **high** priority (avoid drafting a “wish list”).
  - We need to identify gaps ! Stress what is of importance and what needs further development.
  - Structure could be the following:
    1. Key area of research 1
      1. Challenge 1
      2. Challenge 2
      3. ...
    2. Key area of research 2
      1. Challenge 1
      2. Challenge 2
      3. ...
- **We need to keep the policy dimension in mind:** how should national or European policies be shaped to trigger research in these key areas? How can we successfully achieve the step from 1<sup>st</sup> to 2<sup>nd</sup> generation technologies?



Meeting of the subgroup on **Friday 9 April**

Follow up from the last meeting

# The Code of Conduct for Recruitment

- Set of general principles and requirements that should be followed by employers and/or funders when appointing or recruiting researchers
- No publicly available information on the update
- For more information [click here](#).

## GENERAL PRINCIPLES AND REQUIREMENTS FOR THE CODE OF CONDUCT

- + Recruitment
- + Selection
- + Transparency
- + Judging merit
- + Variations in the chronological order of CVs
- + Recognition of mobility experience
- + Recognition of qualifications
- + Seniority
- + Postdoctoral appointments

# Research and Technology Infrastructures

**Developing new pan-European infrastructures and fostering the effective networking of existing ones is a clear objective of the European Commission and the Council.**

## HER related initiatives:

- Getting in contact with the European Strategy Forum on Research Infrastructures
- Mapping of research and technology infrastructures relevant for FCH within our membership

Our Goal: To become an active actor of the governance of Research Infrastructures

# What is the ESFRI?

ESFRI

- The ESFRI is a Strategic instrument to **develop the scientific integration of Europe and to strengthen its international outreach**
- **How?** By promoting the competitive and open access to high quality Research Infrastructures supports and benchmarking the quality of the activities of European scientists.
- **History:** established in 2002 with a mandate from the EU Council
- **Members:** Members are senior science policy officials representing the Research Ministers of EU member states and of Associated Countries. The secretariat is ran by the European Commission.

# What is the ESFRI?

ESFRI

- **Activities:**
  - Carries out analysis of RI landscapes in several reference scientific domains
  - Captures and describes the key RI defining the entire landscape
  - Identifies gaps
  - Enables stakeholders to position their RI initiatives within a broader context and identifies synergies and complementarities with existing RI to refine their strategic priority setting.
  - Organises open calls for proposals

**Have you ever worked / been in contact with the ESFRI?**

\*RI= Research Infrastructures

# Research and Technology Infrastructures

- Dedicated **programme for Research and Technology Infrastructures** under Horizon Europe. A [leaked version](#) of the Work Programme 2021-2022 is available online (subject to changes).

## 5 Destinations considered:

- #1: Developing, consolidating and optimising European RIs landscape, maintaining global leadership
- #2: Enabling an operational, open and FAIR EOSC ecosystem
- #3 RI services to support health research, accelerate the green and digital transformation, and advance frontier knowledge
- #4 Next generation of scientific instrumentation, tools and methods and advanced digital solutions
- #5 Network connectivity in Research and Education –Enabling collaboration without boundaries

Latest updates on EU news

# Launch of Open Research Europe (ORE)

- 
- An Open access research publishing platform to publish research funded through Horizon 2020 and Horizon Europe Publication.
  - Publishing on the platform is optional but can be done for free.
  - Papers will be scrutinized by peers and their reviews will be published.

Currently, 91% of all publications and 95% of all peer-reviewed papers funded by Horizon 2020 are in open access.

Have a look: <https://open-research-europe.ec.europa.eu/>

# Hydrogen and decarbonised gas market package

- The European Commission has started working on the revision of the Gas Directive and Gas Regulation, in order to be in line with the greenhouse gas emissions reduction targets (Fit for 55).
  - Referred to as the **hydrogen and decarbonised gas market package**.
  - Publication intended by the end of 2021.
- A public consultation is open since March 26 until June 18 (12 weeks)!
  - The objective of the consultation is to seek stakeholder views on how these legislations should be revised to “facilitate the uptake **of renewable and low-carbon gases** and consumer empowerment, while ensuring integrated, liquid and interoperable EU internal gas markets”.
  - The consultation includes questions on how to enable and foster a market for renewable and low carbon hydrogen and also address how to facilitate the injection, transmission, distribution and trading of renewable and low carbon gases in the existing gas grid.
- Would it be of interest to the Policy WG to provide a feedback in this public consultation? Collaboration with HE?

# RED II: Debate on the scope of the revision

- Proposal for a revision of the [Renewable Energy Directive](#) expected in Q2 2021.

- Goal:

- To ensure alignment of the renewable energy goals with the European climate ambitions
- To implement the measures proposed in several legislations, including the Energy System Integration and the Hydrogen Strategies



31st March [Open letter](#) to the European Commission

- From 115 MEPs, civil society organisations, businesses and trade associations signed it
- Asking **not to extend the scope of the EU's Renewable Energy Directive (RED II) beyond renewables "including so-called 'low carbon' fossil fuels"**



# EU Taxonomy

- Taxonomy Regulation entered into force on 12 July 2020
  - Establishes the framework for an EU taxonomy by setting out conditions that an economic activity has to meet in order to qualify as environmentally sustainable.
  - 6 environmental objectives:
    1. Climate change mitigation
    2. Climate change adaptation
    3. Sustainable use and protection of water and marine resources
    4. Transition to a circular economy
    5. Pollution prevention and control
    6. Protection and restoration of biodiversity and ecosystems
- Rationale: **redirect investments towards sustainable projects and activities.**
  - But what can be classified as “sustainable”?
- **Delegated Act** establishing a list of environmentally sustainable activities by defining technical screening criteria for each environmental objective currently under elaboration by the European Commission.

# EU Taxonomy – Delegated Act

- Public consultation on delegated act closed since 18 December 2020 (first two environmental objectives).
- The delegated act will be accompanied by an impact assessment and **should be adopted in the second half of April 2021.**
  - Delegated act to be presented to the Member States around mid-April.
- **A 2.256 kgCO<sub>2</sub>eq/kgH<sub>2</sub> threshold for hydrogen produced from the grid was leaked.**
  - This would de facto exclude hydrogen produced from the grid (even electricity generated from solar panels would be above this threshold).
  - Many associations have already argued against this threshold.
  - Emission standards need to be specified: how are the life cycle emissions calculated?
  - Solution: increase the threshold and reduce it over time?

# EU Taxonomy – Delegated Act

- Leaked JRC study on safety and contribution of nuclear energy to sustainable development goals.
  - Among the main conclusions of the report: “The analyses did not reveal any science-based evidence that nuclear energy does more harm to human health or to the environment than other electricity production technologies already included in the taxonomy as activities supporting climate change mitigation.”
  - This could lead to the inclusion of nuclear energy as a sustainable investment under the taxonomy.
- Inclusion of natural gas as a “transition” fuel?
  - Two options:
    1. Recognition of the role of “gaseous and liquid fuels” in providing a backup role for electricity generation, provided that “the direct greenhouse gas emissions of the activity are lower than 244gCO<sub>2</sub>e/kWh” or lifecycle emissions are “lower than 820 kgCO<sub>2</sub>e per kW of net installed capacity.
    2. Creation of a new category recognising “the role of gas-fired electricity generation” in grid stability, provided that “the activity is associated with life-cycle greenhouse gas emissions that are lower than 820 kgCO<sub>2</sub>e per kW of net installed capacity per year.
  - Relevant for gas turbines using hydrogen and stationary fuel cells? Whilst green and low-carbon hydrogen is produced, these technologies could use grey (or blue) hydrogen over a period of time.
  - Associations have voiced their opposition to this transition status for natural gas.

Focus on Horizon Europe

# Horizon Europe: where are we?



The Horizon Europe legislation has been split in **two major components**:

- One was formally approved by all EU institutions in December 2020 (*setting the budget: €95,5 billion for 7 years*)
- The other has yet to be approved by the European Parliament: vote scheduled on 26 April.

The Strategic Plan 2021-2024 was adopted on 15 March to ensure consistency in the programme with EC political priorities.

The first calls will open following the adoption of each work programmes.

The final versions are expected in May but several leaks have circulated online.

Work programme for specific entities have been published (ERC, EIC)

# Horizon Europe: Structure

Strategic Plan & leaked Work Programme

**HORIZON EUROPE**

Work Programme published

**EURATOM**

## SPECIFIC PROGRAMME: EUROPEAN DEFENCE FUND

*Exclusive focus on defence research & development*

Research actions

Development actions

## SPECIFIC PROGRAMME IMPLEMENTING HORIZON EUROPE & EIT\*

*Exclusive focus on civil applications*



**Pillar I  
EXCELLENT SCIENCE**

European Research Council

Marie Skłodowska-Curie

Research Infrastructures



**Pillar II  
GLOBAL CHALLENGES &  
EUROPEAN INDUSTRIAL  
COMPETITIVENESS**

Clusters

- Health
- Culture, Creativity & Inclusive Society
- Civil Security for Society
- Digital, Industry & Space
- Climate, Energy & Mobility
- Food, Bioeconomy, Natural Resources, Agriculture & Environment

Joint Research Centre



**Pillar III  
INNOVATIVE EUROPE**

European Innovation Council

European innovation ecosystems

European Institute of Innovation & Technology\*

**WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA**

Widening participation & spreading excellence

Reforming & Enhancing the European R&I system

Fusion

Fission

Joint Research Center

\* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme

# Work Programme - European Innovation Council - (2021)

- The [work programme](#) for the European Innovation Council (EIC) was adopted on 17 March and the [EIC](#) was formally launched on 18 March.
- Budget: €10b for 7 years
- Goal: translate Europe's world leading science through to market.

## 2 Calls identified:

- EIC Pathfinder Challenge - Novel routes to green hydrogen production (page 59)
- EIC Accelerator Challenge - Green Deal innovations for the Economic Recovery (page 77)

**Table 1. Summary of main calls in 2021<sup>8</sup>**

	Who can apply	What for	Open calls (Section II)		Challenge driven calls (Section III)		
			Call deadline(s)	Indicative Budget (EUR million)	Challenges	Call deadline(s)	Indicative Budget(EUR million)
<b>EIC Pathfinder</b>	Consortia of at least three different independent legal entities (e.g. research organisations, universities, SMEs, industry) established in at least 3 different eligible countries. Single applicants or small consortia (two partners) may be able to apply for Pathfinder Challenges according to the call specifications.	Grants of up to EUR 3 million (open) or EUR 4 million (challenge driven) (or more if properly justified) to achieve the proof of principle and validate the scientific basis of breakthrough technology (TRL 1-4)	19 May 2021	168.00	<ol style="list-style-type: none"> <li>1. Awareness inside</li> <li>2. Tools to measure &amp; stimulate activity in brain tissue</li> <li>3. Emerging Technologies in Cell &amp; Gene Therapy</li> <li>4. Novel routes to green hydrogen production</li> <li>5. Engineered living materials</li> </ol>	27 October 2021	132.00
<b>EIC Transition</b>	Single applicants (SMEs, spin-offs, start-ups, research organisations, universities) or small consortia (two to 5 partners). Applications must build on results from eligible Pathfinder, FET or ERC Proof of Concept projects	Grants of up to EUR 2.5 million (or more if properly justified) to validate and demonstrate technology in application-relevant environment (TRL 4 to 5/6) and develop market readiness	22 September 2021	59.60	<ol style="list-style-type: none"> <li>1. Medical devices</li> <li>2. Energy harvesting and storage technologies</li> </ol>	22 September 2021	40.50
<b>EIC Accelerator</b>	Single Start-ups and SMEs (including spin-outs), individuals (intending to launch a start-up/SME) and in exceptional cases small mid-caps (fewer than 500 employees)	Blended finance: up to EUR 2.5 million grant component for technology development and validation (TRL 5/6 to 8); EUR 0.5 - 15 million investment component for scaling up and other activities. Grant only/grant first under certain conditions. Investment component only for small mid-caps or as follow up to grant only (i.e. for SMEs, including start-ups)	Any time (short applications) Full applications by 9 June 2021 and 6 October 2021	592.50	<ol style="list-style-type: none"> <li>1. Strategic Health and Digital Technologies</li> <li>2. Green Deal innovations for the economic recovery</li> </ol>	Any time (short applications) Full applications by 9 June 2021 and 6 October 2021	495.10

<sup>8</sup> This table provides a simplified overview. All applicants need to read the relevant sections for the full information on eligibility and conditions for funding. The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening. The Director-General responsible may delay the deadline(s) by up to two months.<sup>9</sup> For any applicant to be considered for interview, they must meet all the evaluation criteria at all of the previous steps of the selection process.

# Work Programme - European Research Council - (2021)

- The [work programme](#) for the European Research Council (ERC) was adopted on 22 February 2021.

## Indicative summary of main calls from the 2021 budget<sup>1</sup>

	<i>Starting Grant</i>	<i>Consolidator Grant</i>	<i>Advanced Grant</i>
<i>Call identifier</i>	<b>ERC-2021-StG</b>	<b>ERC-2021-CoG</b>	<b>ERC-2021-AdG</b>
<i>Call Opens</i>	25/02/2021	11/03/2021	20/05/2021
<i>Call closes</i>	24/03/2021	20/04/2021	31/08/2021

# Work Programme - European Research Council - (2021)

## **Physical Sciences & Engineering**

### **PE1 Mathematics**

All areas of mathematics, pure and applied, plus mathematical foundations of computer science, mathematical physics and statistics.

### **PE2 Fundamental Constituents of Matter**

Particle, nuclear, plasma, atomic, molecular, gas, and optical physics.

### **PE3 Condensed Matter Physics**

Structure, electronic properties, fluids, nanosciences, biological physics.

### **PE4 Physical and Analytical Chemical Sciences**

Analytical chemistry, chemical theory, physical chemistry/chemical physics.

### **PE5 Synthetic Chemistry and Materials**

New materials and new synthetic approaches, structure-properties relations, solid state chemistry, molecular architecture, organic chemistry.

### **PE6 Computer Science and Informatics**

Informatics and information systems, computer science, scientific computing, intelligent systems.

### **PE7 Systems and Communication Engineering**

Electrical, electronic, communication, optical and systems engineering.

### **PE8 Products and Processes Engineering**

Product and process design, chemical, civil, environmental, mechanical, vehicle engineering, energy processes and relevant computational methods.

### **PE9 Universe Sciences**

Astro-physics/-chemistry/-biology; solar system; planetary systems; stellar, galactic and extragalactic astronomy; cosmology; space sciences; astronomical instrumentation and data.

### **PE10 Earth System Science**

Physical geography, geology, geophysics, atmospheric sciences, oceanography, climatology, cryology, ecology, global environmental change, biogeochemical cycles, natural resources management.

### **PE11 Materials Engineering**

Advanced materials development: performance enhancement, modelling, large-scale preparation, modification, tailoring, optimisation, novel and combined use of materials, etc.

# Leaked Work Programmes for Pillar 2



The leaked versions are subject to changes and new documents are regularly published.

From the pillar 2, two Clusters are especially relevant for our activities:

- Digital Industry and space (Cluster 4)
- Climate, Energy and Mobility (Cluster 5)

The calls are sometimes mentioning the activities of the JU and synergies can be foreseen.

Have a look at the draft programmes:

<https://sciencebusiness.net/framework-programmes/horizon-papers>

# Cluster 4 - Digital, Industry and Space

## Call - Twin Green and Digital Transition

HORIZON-CL4-2021-TWIN-TRANSITION-01-17: Plastic waste as a circular carbon feedstock for industry (IA)

HORIZON-CL4-2021-TWIN-TRANSITION-01-18: Carbon Direct Avoidance in steel and other metals: Electricity and hydrogen-based metallurgy (IA)

HORIZON-CL4-2021-TWIN-TRANSITION-01-19: Improvement of the yield of the iron and steel making (IA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-15: New electrochemical conversion routes for the production of chemicals and materials in process industries (RIA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-16: Modular and hybrid heating technologies in steel production (IA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-17: Integration of hydrogen for replacing fossil fuels in industrial applications (IA)

# Cluster 4 - Digital, Industry and Space

## Call - A digitized, Resource-efficient and resilient industry 2021

HORIZON-CL4-2021-RESILIENCE-01-11: Safe- and sustainable-by-design polymeric materials (RIA)

HORIZON-CL4-2021-RESILIENCE-01-12: Safe- and sustainable-by-design metallic coatings and engineered surfaces (RIA)

HORIZON-CL4-2021-RESILIENCE-01-17: Advanced materials for hydrogen storage (RIA)

HORIZON-CL4-2021-RESILIENCE-01-18: Novel materials for supercapacitor energy storage (RIA)

HORIZON-CL4-2022-RESILIENCE-01-14: Membranes for gas separations - membrane distillation (IA)

HORIZON-CL4-2022-RESILIENCE-01-20: Climate Neutral and Circular Innovative Materials Technologies Open Innovation Test Beds (IA)

# Cluster 5 - Climate, Energy and Mobility

## Destination 2 - Cross-sectoral solutions for the climate transition

### *Energy breakthrough technologies and climate solutions*

C5-D2-BT-03-2021: Methane cracking to usable hydrogen and carbon

## Destination 5 - Clean and competitive solutions for all transports modes

### *Aviation (AVI) / Zero Emission road transport (ZERT) / Waterborne transport (WAT)*

C5-D5-WAT-01-2021: Enabling the safe and efficient on-board storage and integration within ships of large quantities of ammonia and hydrogen fuels

C5-D5-ZERT-01-2022: Modular multi-powertrain zero-emission systems for HDV (BEV and FCEV) for efficient and economic operation

C5-D5-AVI-01-2021: Greenhouse gas aviation emissions reduction technologies towards climate neutrality by 2050

# Cluster 5 - Climate, Energy and Mobility

## **Destination 3 - Sustainable, Secure and competitive energy supply 2021-2024**

### ***Fostering the European global leadership in affordable, secure and sustainable renewable energy technologies***

C5-D3-RES-02-2021: Next generation of renewable energy technology

C5-D3-RES-11-2021: Carbon-negative sustainable biofuel production

C5-D3-RES-47-2022: Demonstration of complete value chains for advanced biofuel and non-biological renewable fuel production

### ***Energy systems, grids and storage***

C5-D3-ESGS-01-2021: Energy Sector Integration: Integrating and combining energy systems to a cost-optimised and flexible energy system of system (no H2 production or in collaboration with CHE)

C5-D3-ESGS-13-2022: Demonstration of innovative forms of storage and their successful operation and integration into innovative energy systems and grid architectures

C5-D3-ESGS-02-2022: Energy system modelling, optimisation and planning tool

C5-D3-ESGS-17-2021: Interoperability community

# Cluster 5 - Climate, Energy and Mobility

## **Destination 3 - Sustainable, Secure and competitive energy supply 2021-2024**

### *Carbon capture, utilization and storage*

C5-D3-CCUS-01-2021: Integration of CCUS in hubs and clusters, including knowledge sharing activities

C5-D3-CCUS-02-2022: Decarbonising industry with CCUS

C5-D3-CC-02-2021: Support to the activities of the European Geological Service (storage capacities including hydrogen heat and cold)

# Horizon Europe: what's new in the evaluation process?

## **Adjusted evaluation criteria:**

Easier to understand, clearer definitions and consistent use of the terminology. In particular the impact criterion has been revised following a clearer logic linking the project results to the expected outcomes over the medium term, and to the wider long term impacts, as specified in the work programme. Applicants must describe a plausible pathway to impact over time, including beyond the lifetime of a project.

## **A pilot for anonymous evaluations:**

Experts will evaluate an outline of the proposed work without knowing who is behind. This pilot addresses concerns about a possible unconscious partiality that evaluation experts may have in favour of proposals from well-known organisations in countries with better performing R&I systems.

## **A 'Right to react' (rebuttal) evaluation:**

Applicants will be actively involved in the evaluation process by reacting to experts' individual comments. The experts will take applicants' reaction into account before finalising their final assessment. This new feature addresses concerns on the quality of the feedback to applicants and has the potential to increase the transparency of the evaluation system. A pilot will run at the early phase of Horizon Europe to fine tune the implementation modalities.

## **A portfolio approach:**

For calls with a portfolio approach, aiming to fund a group of actions that are intended to achieve all together a measurable common goal, the evaluation will be done in a two-phase approach. Firstly, each proposal is evaluated independently on its own merits based on the standard criteria. Secondly, the best proposals would be assessed with a view to considerations relevant to the creation of a portfolio, as announced in the Work Programme.

# Other points of discussion



# Thank you for your participation!

## **Contacts**

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