



**ANNEX to GB decision n°. FCH-GB-2021-08**

# **FUEL CELLS and HYDROGEN 2 JOINT UNDERTAKING (FCH 2 JU)**

**2022**

## **ANNUAL WORK PLAN and BUDGET**

In accordance with the Statutes of the FCH 2 JU annexed to Council Regulation (EU) No 559/2014 and with Article 31 of the Financial Rules of the FCH 2 JU.

The annual work plan will be made publicly available after its adoption by the Governing Board.

# TABLE OF CONTENTS

<b>1. INTRODUCTION.....</b>	<b>4</b>
<b>2. ANNUAL WORK PLAN YEAR 2022.....</b>	<b>7</b>
<b>2.1 Executive Summary.....</b>	<b>7</b>
<b>2.2 Operations.....</b>	<b>8</b>
Objectives & indicators – Risks & mitigations.....	8
Scientific priorities & challenges.....	11
List of actions.....	12
A. Call for proposals 2022 (N/A).....	12
B. Collaboration with JRC – Rolling Plan 2022.....	13
C. Regulations, Codes and Standards Strategy Coordination (RCS SC) Group.....	18
D. European Hydrogen Safety Panel (EHSP).....	20
E. Knowledge management. Dissemination and exploitation of projects results.....	22
F. Support to EU policies, regions and Member States and Funding/financial engineering.....	26
G. International Cooperation.....	30
H. Operational Procurements (studies).....	31
Conditions for the Call (N/A).....	32
<b>2.3 Call management rules (N/A).....</b>	<b>33</b>
<b>2.4 Support to Operations.....</b>	<b>34</b>
Communication and Outreach Activities.....	34
Administrative Procurements and contracts.....	36
IT and logistics.....	37
JU Executive Team – HR matters.....	38
Administrative budget and finance.....	40
Data protection.....	40
<b>2.5 Governance.....</b>	<b>42</b>
<b>2.6 Internal Control framework.....</b>	<b>44</b>
Financial procedures.....	44
Ex-ante and ex-post controls.....	44
Audits.....	46
<b>3. BUDGET YEAR 2022.....</b>	<b>47</b>
<b>3.1 Budget information.....</b>	<b>47</b>
<b>3.2 Staff Establishment Plan.....</b>	<b>54</b>

<b>4. LIST OF ACRONYMS .....</b>	<b>56</b>
<b>5. ANNEX: HORIZON 2020 INDICATORS FOR JOINT UNDERTAKINGS .....</b>	<b>59</b>
<b>TABLE I: Horizon 2020 Key Performance Indicators common to all JUs .....</b>	<b>60</b>
<b>TABLE II: Indicators for monitoring Horizon 2020 Cross-Cutting Issues common to all JUs.....</b>	<b>65</b>
<b>TABLE III: Key Performance Indicators specific to FCH 2 JU .....</b>	<b>70</b>

# 1. INTRODUCTION

This document establishes the ninth Annual Work Plan (AWP) of the Fuel Cell and Hydrogen 2 Joint Undertaking (FCH 2 JU), outlining the scope and details of its operational and horizontal activities for the year 2022.

FCH 2 JU is an institutionalised public-private partnership focusing on the objective of accelerating the commercialization of fuel cell and hydrogen technologies. FCH 2 JU was setup, within the Horizon 2020 Framework programme, as a Joint Undertaking by Council Regulation N° 559/2014<sup>1</sup>. Its aim is to contribute to the Union's wider competitiveness goals and leverage private investment by means of an industry-led implementation structure. The European Commission (EC) has identified hydrogen as an energy carrier that can both diversify supply sources, decarbonise the energy system and integrate high shares of renewables sources.

On July 2020 the Commission adopted the Energy System Integration<sup>2</sup> and Hydrogen Strategies<sup>3</sup>. Together they aim to address a vision on how to accelerate the transition towards a more integrated and clean energy system, in support of a climate neutral economy. The Energy System Integration Strategy addresses the planning and operation of the energy system “as a whole”, across multiple energy carriers, infrastructures, and consumption sectors. The Strategy sets out 38 actions to implement the necessary reforms, including the promotion of renewable and low-carbon fuels, including hydrogen, for sectors that are hard to decarbonise.

The Hydrogen Strategy aims to create an enabling environment to scale up renewable hydrogen supply and demand for a climate-neutral economy. Building on the Commission’s New Industrial Strategy for Europe<sup>4</sup> and the Recovery Plan for Europe<sup>5</sup>, the Strategy sets out a vision of how the EU can turn hydrogen into a viable solution to decarbonise different sectors over time. It also tries to address the issue that the majority of hydrogen production is today fossil-based, as low-carbon hydrogen is not yet cost-competitive. To achieve this, the strategy outlines a number of key actions and presents three strategic phases in the timeline up to 2050. Most notably, it sets the ambitious goal of installing at least 6 GW of renewable hydrogen electrolyzers in the EU by 2024 and 40 GW of renewable hydrogen electrolyzers by 2030.

On 11 December 2020, the Council adopted conclusions on steps to be taken towards creating a hydrogen market for Europe.<sup>6</sup> The conclusions gave political guidance to the implementation of the EU Hydrogen Strategy presented by the European Commission on 8 July 2020. In its conclusions, the Council recognised the important role of hydrogen, especially from renewable sources, and the need for the hydrogen market to be significantly scaled up, asking the Commission to further elaborate and implement the EU Hydrogen Strategy. The pathway towards the roadmap’s objectives should use joint programmes, be cost-efficient and prioritise energy efficiency and electrification from renewable sources. The Council also sees the need to develop an ambitious hydrogen roadmap and strategy for climate neutrality in the end-use sectors, which makes use of flexible policies.

---

<sup>1</sup> OJ L 169/108 of 7.6.2014

<sup>2</sup> Strategy for Energy System Integration. COM(2020) 299 final.

<sup>3</sup> A Hydrogen Strategy for a climate neutral Europe. COM(2020) 301 final.

<sup>4</sup> New Industrial Strategy for Europe. COM(2020) 102 final.

<sup>5</sup> Europe's moment: Repair and Prepare for the Next Generation. COM(2020) 456 final.

<sup>6</sup> European Council conclusions, 10-11 December 2020.

On 19 May 2021, the European Parliament also adopted a resolution<sup>7</sup> on the European Strategy for Hydrogen. The Member of the Parliament requested for incentives to encourage demand and to create a European hydrogen market and fast deployment of hydrogen infrastructure. They also emphasized the need to phase out fossil-based hydrogen as soon as possible, while certification should be applied to all hydrogen imports, similar to EU-produced hydrogen. Finally, they requested to assess the possibility of repurposing existing gas pipelines for the transport and underground storage of hydrogen.

On 28 June 2021 the first ever Climate Law for Europe<sup>8</sup> was adopted, writing into law the goals set out in the European Green Deal. The first European Climate Law sets the goal of climate-neutrality by 2050 and includes a binding EU climate target for reducing net GHG emissions by at least 55% by 2030 compared to 1990, significantly increasing the previous 2030 target of 40% agreed a few years back in 2014.

To achieve these ambitious goals, the European Commission adopted on 14 July 2021 the 'Fit for 55' package<sup>9</sup> of policy proposals to make the EU's climate, energy, land use, transport and taxation policies fit for this target. It is a broad package, containing 13 different proposals approaching the goal of emission reductions from many different angles, with both targeted and horizontal policy measures. Increasing renewable energy, energy efficiency and member states' non-ETS targets, while strengthening the EU emission trading system (EU ETS), including creating a new ETS for buildings and road transport. Restructuring energy taxation in Europe – including the introduction of a carbon border adjustment mechanism -, but also revising the CO<sub>2</sub> emission standards for new cars. Accelerating the development of alternative fuel infrastructure, while at the same time promoting the use of sustainable fuels in Aviation and Maritime. Creating a social climate fund and acknowledging the importance of forests and land use in achieving our climate goals. Its proposals will be complemented in Q4 2021 with the Hydrogen and Gas markets Decarbonisation Package<sup>10</sup> and in Q4 2022 with the CO<sub>2</sub> Standards on Heavy Duty Vehicles<sup>11</sup>.

As the first step in the implementation of the EU Hydrogen Strategy, the 'Fit for 55' package contains a number of measures aiming to promote the production and use of hydrogen and hydrogen based fuels in the different sectors of the economy. The revised Renewable Energy Directive<sup>12</sup> proposes the extension of the EU-wide certification system for renewable fuels to include hydrogen<sup>13</sup>, as well as targets for transport<sup>14</sup> and industry<sup>15</sup> that include renewable hydrogen consumption. Additional

---

<sup>7</sup> European Parliament resolution of 19 May 2021 on a European Strategy for Hydrogen (2020/2242(INI))

<sup>8</sup> Regulation (EU) 2021/1119 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law').

<sup>9</sup> 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality, COM(2021) 550, July 2021.

<sup>10</sup> The combined evaluation roadmap and inception impact assessment of the initiative can be found [here](#). This initiative aims to address a number of issues associated with gas markets and networks, including hydrogen.

<sup>11</sup> Announced on August 2021, timeline can be found [here](#).

<sup>12</sup> Proposal for a Directive as regards the promotion of energy from renewable sources. COM (2021) 557 final.

<sup>13</sup> Renewable Fuels of Non-Biological (RFNBO) now include renewable hydrogen.

<sup>14</sup> at least 2,6 % share of RFNBO in the energy supplied to the transport sector

<sup>15</sup> 50 % of the hydrogen used for final energy and non-energy purposes should come from RFNBO

financial incentives for hydrogen are foreseen by the revision of the EU ETS proposal,<sup>16</sup> which shall extend to maritime, establish emissions trading for transport and buildings; and include electrolytic hydrogen under ETS, thus making low carbon hydrogen eligible for free allowances. Further incentives shall be given through the preferential taxes for the use of low carbon hydrogen, foreseen in the revision of the Energy Taxation Directive.<sup>17</sup> Hydrogen is promoted specifically in the transport sector by three additional targeted proposals: the more stringent CO<sub>2</sub> standards for Cars and Vans;<sup>18</sup> the revision of the Alternative Fuel Infrastructure Regulation<sup>19</sup>, requiring one hydrogen refuelling station available every 150 km along the TEN-T core network and in every urban nodes by 2030; and the FuelEU Maritime proposal<sup>20</sup> promoting strongly low carbon hydrogen and hydrogen-based fuels (including methanol and ammonia).

In line with all the policy developments described above, it is crucial that the FCH 2 JU continues to support its existing projects and develop technology solutions that will help materialise the benefits of hydrogen and fuel cell technologies in support of the high level EU policy agenda. The present Annual Work Plan 2022 of the Fuel Cells and Hydrogen 2 Joint Undertaking will continue to support such solutions, in line with all the FCH 2 JU objectives as listed in Council Regulation 559/2014 of 6 May 2014:

1. Reduce the production cost of fuel cell systems to be used in transport applications, while increasing their lifetime to levels which can compete with conventional technologies;
2. Increase the electrical efficiency and the durability of the different fuel cells used for power production to levels which can compete with conventional technologies, while reducing costs;
3. Increase the energy efficiency of production of hydrogen mainly from water electrolysis and renewable sources while reducing operating and capital costs, so that the combined system of the hydrogen production and the conversion using fuel cell system can compete with the alternatives for electricity production available on the market;
4. Demonstrate on a large scale the feasibility of using hydrogen to support integration of renewable energy sources into the energy systems, including through its use as a competitive energy storage medium for electricity produced from renewable energy sources;
5. Reduce the use of the EU defined ‘Critical raw materials’, for instance through low-platinum or platinum-free resources and through recycling or reducing or avoiding the use of rare earth elements.

---

<sup>16</sup> Establishing a system for greenhouse gas emission allowance trading with the Union. COM (2021) 551 final.

<sup>17</sup> Restructuring the Union framework for taxation of energy products and electricity, COM (2021) 563 final.

<sup>18</sup> Strengthening the CO<sub>2</sub> emission performance standards for new passenger cars and new light commercial vehicles in line with the Union’s increased climate ambition. COM (2021) 556 final.

<sup>19</sup> Regulation on the deployment of alternative fuels infrastructure. COM (2021) 559 final.

<sup>20</sup> Regulation on the use of renewable and low-carbon fuels in maritime transport. COM (2021) 562 final.

## 2. ANNUAL WORK PLAN YEAR 2022

### 2.1 Executive Summary

The Annual Work Plan 2022 for the FCH 2 JU continues the work initiated in previous years concerning the development of a research and innovation programme aligned with the objectives set in Council Regulation 559/2014 of 6 May 2014<sup>21</sup>.

As the FCH 2 JU has already committed most of its operational budget through its annual calls for proposals (2014-2020), as of 2021 there is no substantial budget to further commit and therefore no call for proposals. However, a very limited operational budget is still available to continue funding the support activities such as Rolling Plan of Joint research Centre, JRC and the European Hydrogen Safety Panel, EHSP of experts.

Work will continue on the different operational activities along the follow-up and implementation of the budget committed in previous years, and to ensure that the support activities to operations provided by the Programme Office facilitates the proper management of H2020 and FP7 funds, according to the principles laid out in the financial guidelines.

In 2022, the FCH JU will assess the highest amount of H2020 grants from operational, financial and compliance perspective, as the number of ongoing grants of H2020 will reach its peak. Similarly, in 2022, also number of ongoing ex-post audits for H2020 programme will reach its yearly maximum for the H2020 framework programme.

Communication and outreach activities will ensure that stakeholders are duly informed about the activities and results of the FCH 2 JU, raising the FCH 2 JU Programme's profile and highlighting technology potential and market readiness.

---

<sup>21</sup> Until the time of approval of the present draft of the AWP 2022, the final adoption of the Regulation establishing the Joint Undertakings under Horizon Europe (hereby Regulation) - including the one of the Clean Hydrogen Joint Undertaking, expected to replace and build on the existing FCH 2 JU – has not been completed yet. Therefore, the present draft describes the continuation of the planned activities of the FCH 2 JU, without considering the additional tasks described in the Regulation for the Clean Hydrogen Joint Undertaking. In the coming months and after the adoption of the Regulation and the formal establishment of the Clean Hydrogen JU, the present AWP 2022 will be amended accordingly to reflect all the additional activities of the next Joint Undertaking.

## 2.2 Operations

### Objectives & indicators – Risks & mitigations

#### *Techno-economic objectives*

The techno-economic objectives laid out in the Multi-Annual Work Plan (MAWP) 2014-2020<sup>22</sup> are addressed in this AWP through the follow-up of the signed grant agreements from previous AWPs.

#### *Key Performance Indicators (KPIs)*

FCH 2 JU follows the objectives and technical targets defined in the MAWP. These are integrated in the ongoing projects/grant agreements.

A list of indicators (see Annex) was developed by the European Commission services; the indicators are grouped into 3 categories as follows:

1. Horizon 2020 Key Performance Indicators<sup>23</sup> common to all JUs;
2. Indicators for monitoring H2020 Cross-Cutting Issues<sup>24</sup> common to all JUs;
3. Key Performance Indicators specific to FCH 2 JU;

#### *Risk Assessment*

In the annual risk assessment exercise, conducted in October 2021, the following significant risks (medium level of residual risk) & responses to those risks in terms of action plans were identified:

	<b>Risk Identified</b>	<b>Action Plan</b>
<b>MEDIUM</b>	<p>Due to limitation of H2020 ex-ante controls (trust-based approach with minimum amount of default checks), representative error rate for FCH 2 JU may increase.</p> <p>Consequently, there is a risk of obtaining a qualified opinion and of not getting the discharge from the European Parliament due to fact that the Court of Auditors' threshold for a residual representative error rate stays at the level of 2%.</p> <p>(NB: H2020 ex-ante control strategy envisaged level of the residual error rate in the range between 2-5%)</p>	<p>Annual analytical risk – assessment at the beneficiary level and subsequent introduction of the targeted ex-ante controls for the projects / beneficiaries with higher identified inherent risk, in line with the internal risk monitoring guidance.</p> <p>Application of the feedback from ex-post audits and lessons learnt on ex-ante controls.</p> <p>Continuation of the financial webinars for beneficiaries with higher inherent and control risks.</p>

<sup>22</sup> <http://www.fch.europa.eu/page/multi-annual-work-plan>

<sup>23</sup> Based on Annex II - Council Decision 2013/743/EU

<sup>24</sup> Based on Annex III - Council Decision 2013/743/EU



MEDIUM	<p>Due to COVID-19, to ensure business continuity, FCH 2 JU is highly dependent on safe and proper functioning of the IT tools and network connection, which become increasingly vulnerable to potential cyberattacks, performance inefficiencies and connection failures due to increased traffic, different level of security connection and increased levels of pirate attacks and phishing.</p> <p>Unknown weaknesses in the systems may pose higher risks of failures of the operations, and also they may create opportunities for fraudulent behaviour.</p>	<p>Mitigating actions include raising awareness of staff and mechanisms to prevent attacks including the following:</p> <ul style="list-style-type: none"> <li>- Improved ex-ante and ex-post security systems controls for automated attacks;</li> <li>- Increased the level of controls were implemented with CERT-EU;</li> </ul> <p>Increased level of security and advanced protection were adopted;</p> <p>Training and awareness sessions for increased security measures should be put in place further.</p> <p>The Joint Undertaking will reinforce its resilience to ever evolving digital security threats. The Cybersecurity will be reinforced by the implementation of the forthcoming Infosec regulation and the future role of Cyber Security Officer</p>
MEDIUM	<p>Risk that program objectives will not be achieved fully and timely due to delays in project execution attributed to COVID-19.</p>	<p>Mitigating actions are in place for monitoring of any delays in the project, restructuring of the projects, if necessary, granting project extension in average of 6 months due to COVID-19 via amendment process.</p>
MEDIUM	<p>Risk of disruption of the operations in case substantial amount of people would be infected by COVID-19 variants or due to the decrease in immunisation, combined with a risk of staff disengaging from the culture of the organization.</p>	<p>Adequate back-up systems are in place, coaching sessions and regular virtual team meetings are in place. Employees were vaccinated against COVID-19 and return on regular basis to the office. The teambuilding event and unit lunches help employees reunite in a relax atmosphere.</p>

Additionally, in preparing for the transition to the next Clean Hydrogen Partnership/JU, the following preliminary risks have been already identified. They will be complemented by an extensive risk assessment once the Clean Hydrogen Partnership/JU enters into force.

MEDIUM	<p>Risk of meeting H2020 and Horizon Europe objectives due to insufficient manpower, as in the upcoming years, the programme office will be running two framework programmes simultaneously, H2020 in the peak of implementation, Horizon Europe with increased 50% of the budget (approx. one third to be committed in the first year), with only two additional FTEs for 2022 - 2027.</p>	<p>Use of service contracts for support activities, increased coordination and efficiency gains through synergies with other joint undertakings.</p>
MEDIUM	<p>Risk of missing synergies with other partnerships and other EC programmes or</p>	<p>The programme office considers it is in its mandate to coordinate the synergy efforts required by the SBA, building on the extensive</p>

	MS/regional funds for hydrogen technologies due to unclear mandate on coordination.	<p>experience in implementing such synergies in the existing FCH JU.</p> <p>Forthcoming Stakeholder group should be the required structure for the Clean Hydrogen partnership, to propose and follow-up on synergies with the Programme Office in an effective manner.</p>
MEDIUM	<p>Risk of unclear arrangements of the common back office planned to be in place in 2023 which can result in resources inefficiencies, double work or even staff leaving.</p> <p>(e.g. accounting by DG BUDG already put into question and suggested to be re-addressed by the JUs)</p>	<p>Together with other joint undertakings, FCH JU will participate in a common study for the back office arrangements with an external provider to assess efficiencies and potential gains of the planned back office arrangements.</p>

The FCH 2 JU monitors closely the fulfilment of the action plan and reports on it in its Annual Activity Report.

## Scientific priorities & challenges

In order to achieve its objectives, the FCH 2 JU will continue to follow-up the signed grants from calls 2014-2020, including work to reinforce the European supply chain of critical key components by e.g. a higher range of common/standardised parts to be produced in EU and H2020 Associated Countries, and to enable start investments in production facilities for further ramp-up in these markets.

International collaboration with countries under International Partnership of Hydrogen into the Economy (IPHE)<sup>25</sup> is continuously encouraged in the supported grants. Cooperation within the Clean Hydrogen Mission<sup>26</sup> under Mission Innovation 2.0 is foreseen, in particular through the maintenance and further improvement of the Hydrogen Valleys platform.

FCH 2 JU will continue to support MS and Regions through its funding and financial engineering activities, including follow-up of the large-scale sectoral integrated projects under the Hydrogen Valleys concept.

For proper technology monitoring and progress against state-of-art, but also to identify how each of the projects contribute to reaching the targets and indicators set by the MAWP 2014-2020, supported projects will continue to report on an annual basis in the FCH 2 JU secure online data collection platform (TRUST), according to template questionnaire(s) relevant to the project content (and the technology development and TRL). This should be integrated as specific annual deliverable in the grant agreement.

---

<sup>25</sup> <https://www.iphe.net/>

<sup>26</sup> <http://mission-innovation.net/missions/hydrogen/>

## **List of actions**

For the implementation of the Work Plan, the following actions will be taken in 2022.

### *A. Call for proposals 2022*

There is no call for proposals to be launched in 2022.

## *B. Collaboration with JRC – Rolling Plan 2022*

The Commission's Joint Research Centre (JRC) undertakes high quality research in the field of fuel cells and hydrogen that is of considerable relevance to the implementation of the FCH 2 JU activities. During the FP7 period, cooperation between the JRC and FCH 1 JU was structured under a Framework Agreement that covered support activities which JRC provided in-kind to FCH JU, as well as possible funded JRC participation to FCH JU projects.

For the Horizon 2020 period, a Framework Contract between FCH 2 JU and JRC was approved by the Governing Board on 23/12/2015 and signed by both parties on 18/02/2016. The scope of the Framework Contract covers the activities that JRC provides to the FCH 2 JU, both free of charge and against payment from the FCH 2 JU operational budget. In line with the JRC mission, these support activities will primarily contribute to formulation and implementation of the FCH 2 JU strategy and activities in the areas of support to standardisation and technology monitoring and assessment. In addition, the Programme Office may call upon JRC to perform testing as a service to FCH 2 JU, providing added value to programme objectives by complementing activities of FCH 2 JU funded projects. For the year 2022, a maximum budget of EUR 1 million euro from the FCH 2 JU operational budget is foreseen.

The JRC support activities to the FCH 2 JU programme covered by the Framework Contract are discussed and agreed on an annual basis between the JRC and the Programme Office, with involvement of representatives of Hydrogen Europe and Hydrogen Europe Research.

The annual Rolling Plan 2022 (based on the similar plans approved and executed from 2016 onwards), constitutes part of this work-plan and describes the annual activities and their related deliverables provided by JRC to FCH 2 JU (heading B of Article 2 in the Framework Contract) against payment. The additional activities which JRC performs without payment (heading A in Article 2) are not part of the annual Rolling Plan. They consist of activities within international collaborations, as well as in support of programme definition and implementation.

### B.1 JRC support to formulation and implementation of RCS strategy

In general, RCS activities at FCH 2 JU consist of identifying and prioritising RCS needs of strategic importance for the EU including the pre-normative activities required to support the RCS priorities identified. Specific on PNR activities, it is critical to ensure that their results are developed for and used for RCS development. To this purpose, a RCS Strategy Coordination group was created, as defined in the Section 4.2 of the MAWP 2014-2023. Throughout H2020, JRC has been part of RCS SC group, providing the state of the art and gaps analysis required for the mentioned RCS and PNR prioritisation. A key result of the efforts during H2020 is the now stronger link between FCH 2 JU PNR projects and the standardisation development occurring outside the frame of the FCH 2 JU.

Under Horizon Europe, the approach to RCS strategy and the RCS group will be revised, and a new RCS Task Force created. JRC will contribute to the high-level activities of this new body, contributing to the annual strategic prioritisation of the PNR/RCS needs, jointly by all stakeholders. Since this new approach to RCS strategy is not yet completely defined, no specific deliverable is set for 2022.

### B.2. JRC direct contribution to implementing RCS strategy

To provide inter-project comparable results and to facilitate assessment of technology progress without compromising on IPR issues, FCH 2 JU formed working groups lead by JRC, aiming at a European harmonisation of the existing testing protocols and procedures. The harmonised tests

should be consented to by industry and enable a consistent performance assessment. JRC will also participate to the standardisation activities of IEC TC 105 Fuel Cell Technologies. This work, performed by means of JRC own resources, allows to disseminate in a global context the European the tests harmonisation achievements and to support European interests. Moreover, JRC follows similar ongoing efforts in the US, for a possible co-normative collaboration.

In 2021, the FCH 2 JU working group on test harmonisation for high temperature water electrolysis (HTE) applications, coordinated by the JRC, has published the terminology report. Also the multiannual effort on low temperature water electrolysis tests was finalised with a protocols harmonisation report, which integrated also the finding of project QUALYGRIDS.

The JRC electrolysis harmonisation work will continue pursuing harmonisation activities, together with the dedicated working groups, on energy performance of high temperature steam electrolyzers. The work commenced in 2021 and the report, being a proposal for development of future protocols will be finalized in collaboration with the dedicated WG in the first half of 2022.

In the period 2017-2018, JRC has designed and manufactured a reference test cell hardware for PEM fuel cells the ZERO $\nabla$ CELL, a single cell test hardware aiming at minimising the effect of the testing device on the overall test results. Since 2019, JRC has extensively tested the hardware, and has made the design of the ZERO $\nabla$ CELL hardware available to relevant European projects and stakeholders. JRC will continue to provide technical support and assistance to individual users on request.

JRC will also support the ongoing Ad ASTRA project by carrying out testing activities in their labs.

**B.2.1** Support provided to the FCH community for the use of JRC ZERO $\nabla$ CELL single cell test hardware for PEM fuel cells (*including feedback from users*). Annual activity report (December 2022).

**B.2.2** Report on harmonised testing protocols for assessing energy performance of high temperature steam electrolysis single cells and short stacks: draft for public stakeholder consultation possibly by summer-end (September 2022). This implies interactions and agreement with the WG before the date.

**B.2.3** Report on harmonised testing protocols for assessing energy performance of high temperature steam electrolysis single cells and short stacks: manuscript ready for proof-reading and publication (December 2022).

**B.2.4** Summary on experimental activities performed in the frame of the Ad ASTRA project (December 2022).

### B.3 JRC contribution to programme monitoring and assessment

Technology benchmarking. To allow for an assessment of European achievement against the international state-of-the-art, so-called 'reference data' also needs to be collected. In the past few years, JRC has delivered the reference data related to some priority technologies. In 2022, JRC will support the update of information on the international state-of-the-art for selected technologies, as well as gather new information, as requested, taking into account other ongoing efforts.

In 2019, the JRC has begun a historical analysis of the performance of selected FCH JU projects against the overall Programme Targets, using, wherever possible, quantitative values and Key Performance Indicators (KPI) for assessment. The purpose of this exercise is to see how the programme has enhanced the state of the art for selected technologies and to identify potential gaps for their future development. This work is to continued in 2022 for other technologies, following the 2019/2020 reports on electrolysis and stationary fuel cells.

**B.3.1** Support to knowledge management through technology monitoring and assessment of the FCH JU project portfolio. Historical analysis report on project portfolio of FCH JU and FCH 2 JU on the state of the art of FCEV, hydrogen buses and hydrogen fuelling stations (December 2022)

Support to Programme Monitoring and Assessment by means of JRC tools. Unit JRC.I.3 will continue to adapt to the needs of the FCH 2 JU the JRC Tools for Innovation Monitoring (TIM). TIM is a tool gathering scientific literature, patent data, news articles and data from R&D projects funded by the EU, aiming at monitoring and analysing thematic or technological areas, tracking currently used or emerging technologies. The JRC has developed a FCH 2 JU-specific version of TIM to provide the FCH 2 JU with a system customised with features related specifically to its programme, such as tagging functions of FCH beneficiaries. The mapping of technology fields (alkaline electrolysers/FC, H<sub>2</sub> production methods, polymer electrolyte membrane FC/electrolysers and solid oxide FC/electrolysers, transport applications, hydrogen safety) will be annually broadened, with the additional provision of some data cleaning, in order to maximize accuracy of publishable results. New metrics based on publications and patents, to assist the monitoring and reporting of relevant KPIs, will be further discussed and possibly developed in TIM. An effort will be made to provide to FCH JU direct access to the TIM platform (software) as internal users, in order to be able to perform keyword searches. Content delivery will proceed based on requests of the FCH 2 JU.

**B.3.2** Maintenance, operation and extension of FCH Technology Innovation Monitoring System FCH TIM (December 2022)

Programme Annual Review. As in previous years, JRC will perform a full programme review cycle for the year 2022, in the form of an internal report.

**B.3.3** Update of methodology for the Programme Review in view of the transition to the new Clean Hydrogen Joint Undertaking. This will consider the lessons learnt from the previous Programme Reviews and the needs for a lighter and more effective impact (February 2022).

**B.3.4** Draft report (1<sup>st</sup> draft June 2022, 2<sup>nd</sup> draft August 2022).

**B.3.5** Final JRC internal report, delivered before the Programme Review Days (PRD) 2022 (September 2022).

#### B.4 JRC contribution to assessment of sustainability of hydrogen and fuel cells

Sustainability aspects. One of the main strategic objectives of the FCH 2 JU, as laid down in the MAWP, is to boost the share of FCH technologies in a sustainable, low-carbon energy and transport system. Among the specific objectives, the FCH 2 JU aims to better manage the use of EU-defined 'critical raw materials' and to ensure that environmental (and social) impacts along the life cycle are minimized. As a tool to support and monitor progress on the sustainability objectives, the FCH 2 JU has defined a Life-Cycle Assessment (LCA) methodology which is to be applied to its projects and products. LCA is part of the FCH 2 JU strategy: *"it is expected that LCAs will be performed at both project and programme levels. The resulting Life Cycle Inventory (LCI) data sets will form a database, published as part of the ILCD Data Network, and maintained by the industry partners of the FCH 2 JU. The FCH 2 JU shall also establish an international exchange, thus providing for a globally consistent framework."*

In 2018, JRC has provided an inventory and gap analysis of the work performed in the various projects to the FCH 2 JU, focussing on LCA methodology. Based on the outcome of this analysis, a need for a harmonisation effort in the approach to LCA was identified, and a dedicated call topic was included in the AWP 2020. With the funding of three LCA projects (i.e., i.e. SH2E, Best4Hy, and eGHOST), in 2022

JRC will support efforts for this harmonisation. Moreover, JRC plan to contribute to the development of a “criticality indicator” and the guidelines for assessing the social life cycle impact of hydrogen technologies. For this, the Programme Office of the FCH 2 JU will enable JRC involvement within the mentioned projects.

In addition, JRC will continue the life cycle assessment of various modes of hydrogen delivery, including the analysis of transport means and conversion of hydrogen to different carriers. The assessment started in 2021 limited to the global warming impact, and it will be completed in 2022 with the investigation of additional environmental categories (e.g., resource use).

In 2022, the JRC will continue to assess the life cycle based deliverables of all ongoing projects and report to the FCH JU. JRC will also support the FCH 2 JU in developing a strategy for life cycle data collection from projects and population of a LCI database with FCH technology data.

**B.4.1** Report on the JRC supporting activities on life cycle-based aspects of all ongoing projects (December 2022). JRC will support the projects resulted from the call 2020 (i.e. SH2E, Best4Hy, and eGHOST): JRC plans to contribute to the harmonisation effort in the approach to LCA, including related to life cycle inventory (LCI) data. This activity will also cover contributions to the development of a “criticality indicator” and of the guidelines for assessing the social life cycle impact of hydrogen technologies.

The report will also include the annual review of the life cycle based deliverables of all ongoing JU projects (i.e., spreadsheet with the review of each deliverable, and a summary with the main outcomes of the review).

**B.4.2** Report on sustainability of hydrogen transport options (June 2022). JRC will continue the life cycle assessment of various modes of hydrogen delivery, including the analysis of transport means and conversion of hydrogen to different carriers. The assessment started in 2021 on global warming impact and will be completed in 2022 with the investigation of additional environmental categories (e.g. resource use).

**B.4.3** Proposal for a strategy for life cycle data collection from projects and population of a LCI database with FCH technology data (December 2022). JRC will support FCH JU in developing a strategy for life cycle inventory (LCI) data collection from projects, addressing in particular data quality requirement (e.g. ILCD compliance/EF compliance), for the creation and the maintenance of a dedicated LCI database with FCH technology LCI data using the Life Cycle Data Network (LCDN) infrastructure. The JRC will produce a guidance for the integration of LCI datasets in a “Hydrogen node” of the Life Cycle data Network, covering technical and organizational aspects: the on-going projects will hence be able to submit their LCI datasets to the “hydrogen node”. At least one exemplary dataset will be integrated into the “hydrogen node”.

#### **B.5 JRC contribution to safety, and safety awareness**

Since the launching of the European Hydrogen Safety Panel (EHSP) in 2017 (see the dedicated section in the Addendum to the Multi - Annual Work Plan 2014 - 2020), JRC activities related to hydrogen safety have been progressively integrated in those of ESHP. These activities consisted in first instance in the maintenance and continuous population of the hydrogen accidents database HIAD 2.0. In 2018-2020 the EHSP has collected new events and delivered them to HIAD 2.0, while JRC has performed their validation, by performing quality check, harmonising event descriptions and finally approving (or



rejecting) the public sharing of the event. Since 2019, the EHSP has assessed the new data by statistical analyses and extracted lessons learnt. This joint JRC-EHSP work resulted in a comprehensive report in 2021, summarised in a contribution to the International Conference on Hydrogen Safety ICHS2021, which received the best paper award. The JRC has also extracted Report lessons learned from incidents in specific sectors, upon requests of the EHSP or individual external HIAD 2.0 users.

The operation and utilisation of the HIAD 2.0 has naturally identified improvements needs. JRC and the EHSP are collecting all these improvements, to be implemented in a future major upgrade of the database structure.

In addition to HIAD 2.0, JRC manages also the restricted-access database HELLEN (Hydrogen Events and Lesson LEarNed): HELLEN has the same structure as HIAD2.0, but contains the events (incidents or accidents) occurring during the execution of any FCH 2 JU Project. There is a commitment to provide event description to HELLEN for all the FCH 2 JU projects. Access to HELLEN is limited only to selected staff of the FCH 2 JU and to the JRC-HIAD team.

Since 2020, JRC has reduced its safety-related activities in the field of hydrogen technologies. This is due also to the increased taking-up of activities by the EHSP. In 2021, the JRC databases were taken off-line due to new security requirements. This did not stopped the population and analysis of the data, but requires in 2022 a solution for the re-location of the databases, with possible passage of ownership.

**B.5.1** HELLEN operation: HELLEN population with the events delivered by projects and annual report (December 2022).

**B.5.2** Contribution to the EHSP activities, in particular in the field of hydrogen safety, including co-writing of relevant reports (continuous).

**B.5.3** Report on the return of experience for specific sectors as contribution to the workshops organised by the EHSP (before the dates of the workshops).

**B.5.4** Proposal for re-location of the two databases onto a new online platform, with possible passage of ownership (December 2022).

**RESOURCES REQUIRED FOR THE SUPPORT AT PROGRAMME LEVEL**

(these are values reflecting approximately the true figures from the Cost Evaluation Form of the Framework Contract)

Deliverable number	Deliverable title	Effort [PM]
B.1	Support to formulation and implementation of RCS strategy (RCS SC group)	0.5
B.2	Direct contribution to implementing RCS strategy (Harmonisation)	7.0
B.3	Contribution to programme monitoring and assessment	20.0
B.4	Assessment of sustainability	10.0
B.5	Support to safety aspects	1.0
	Manpower Totals [PM]	38.5

	Overview indicative costs (with overhead) [k€]
Manpower	450
Missions	10
Consumables (for B.2.4)	10
Hardware (TIM, B.3.2)	10
Subcontract (for historical analysis)	50
Subcontract (for LCA expertise, B.4)	60
Subcontract (for preparatory work to re-locate databases of B.5)	10
Service Contract consultants (for TIM, deliverables B.3.3)	95
Total indicative cost for 2022	695

Costs includes overhead costs = 25%

JRC will report on a regular basis (every month) on deliverables progress and meet the Programme Office every three months.

### *C. Regulations, Codes and Standards Strategy Coordination (RCS SC) Group*

The establishment and implementation of a multi-annual Regulations, Codes and Standards (RCS) strategy is crucial for the market deployment of FCH systems. The development of common regulations and codes, the harmonisation of standards, also carrying out Pre-Normative Research (PNR) to address RCS knowledge gaps at EU (and world) level is recognised as something that would greatly facilitate the commercialization of hydrogen-based technologies. Inconsistent and conflicting regulations and standards will hinder the development of FCH technologies through lack of confidence from stakeholders (customers, authorities) and impair the reduction of costs linked to experience gained and economies of scale.

The overall goal of the RCS Strategy is to enable the development and application of any necessary safety and harmonized performance-based standards for FCH appliances and systems for energy and transport applications so that these standards can be referred to in legislation.

The RCS Strategy therefore aims to facilitate activities which will enable EU industry interests to be met, e.g. establishing compliance/certification criteria within the EC and United Nations (UN) regulatory framework; developing international and European standards that provide the technical requirements to achieve safety and build confidence; as well as to guide authorities and other stakeholders in their application.

The FCH 2 JU tackles RCS-related issues mainly through the Cross-cutting activities and for the RCS Strategy, an industry-led RCS SC Group was created in 2015 with the aim of addressing the needs of the EU FCH sector.

The RCS SC Group<sup>27</sup>, consisting of representatives of organisations in the Hydrogen Europe and Hydrogen Europe Research groupings, supported by the European Commission's Joint Research Centre (JRC) and the FCH 2 JU Programme Office (PO), coordinates the strategy on RCS. The four main tasks of the RCS SC Group are to:

1. Identify and prioritise RCS needs of strategic importance for the EU, through following RCS developments, and updating and prioritizing RCS needs of the sector through a continuous global watch function;
2. Identify PNR activities to support the RCS priorities, tailor PNR and other RCS-related activities in the FCH 2 JU programme to ensure that safety issues and needs for standardization and regulation are appropriately addressed and validated;
3. Transfer and ensure application of the projects' PNR results into RCS development;
4. Define a strategy to pursue the priority RCS issues (including through use of projects results, as above).

The activities include interfacing with regulatory bodies (e.g. EC, UN), and international organizations for standardization (e.g. ISO, IEC, CEN, CENELEC) for development/amendment of international standards and regulations. To progress these tasks, through its members, the RCS SC group interacts with standardisation and regulatory bodies particularly by introducing EU interests into these bodies, and coordinating the attendance of EU representatives.

Since 2016, the RCS SC Group has identified and prioritised the main RCS needs of strategic importance for the EU and based on them, has provided recommendations of priority areas and specific topics

---

<sup>27</sup> <https://www.fch.europa.eu/page/rcs-strategy-coordination-group>

within for incorporation into the FCH 2 JU Annual Work Plans. Furthermore, a strategy implementation plan has been developed and adopted to further define the tasks of the RCS SC Group.

In 2022, the RCS SC Group will continue with these activities, as laid out in its annual work plan, while redefining its structure/scope in view of forthcoming Clean Hydrogen Partnership related activities.

#### *D. European Hydrogen Safety Panel (EHSP)*

Hydrogen technologies are undergoing rapid expansion across multiple applications. Hydrogen technologies are now at a critical stage with massive growth predicted, but there are some aspects that need further improvements and safety along the whole hydrogen chain is paramount.

The FCH 2 JU launched the EHSP<sup>28</sup> initiative in 2017. The mission of the EHSP is to assist the FCH 2 JU at both programme and at project level in assuring that hydrogen safety is adequately managed, and to promote and disseminate hydrogen safety culture within and outside of the FCH 2 JU programme.

The EHSP is composed of a multidisciplinary pool of experts (e.g. 15 experts in 2021) organised in four ad-hoc working groups (task forces) according to their individual expertise and the tasks to be performed. Collectively, the members of the EHSP have the necessary scientific competencies and expertise covering the technical domain needed to make science-based recommendations to the FCH 2 JU.

In 2022, the EHSP will concentrate the effort on the following activities, organised by task force (TF).

##### TF.1 Support at project level

The EHSP activities under this task force aim at coordinating a package of measures to avoid any accident by integrating safety learnings, expertise and planning into FCH 2 JU funded projects by ensuring that all projects address and incorporate the state-of-the-art in hydrogen safety appropriately. In 2022, the document “Safety Planning and Management in EU Hydrogen and Fuel Cells Projects – Guidance document”<sup>29</sup> published in 2021 will be updated. Furthermore, the EHSP will continue to perform Safety Plans Reviews, i.e. – assessing the Safety Management of ongoing projects, and Safety Specific Sessions will be organised with projects or sets of projects with similar applications coverage.

##### TF.2 Support at programme level

The EHSP works under this task force are intrinsically linked with the activities of the previous task force but with a broader cross-cutting dimension, focused on the FCH 2 JU programme, and how safety-related aspects can be enhanced within the overall programme and activities. The main activity within this task force in 2022 will be to provide further guidance in developing areas including but not limited to heavy-duty vehicles, aviation, rail and waterborne applications. In addition, the links with the homologue US Hydrogen Safety Panel, the International Association HySafe (and related international activities such as Research Priorities Workshop), the IPHE and the Hydrogen Council will be further strengthened. Last, further development of emergency crisis management document (and links to ‘crisis communication’) will be also performed.

##### TF.3 Data collection and assessment

As learning from past accidents, incidents and near misses is an essential element of a high-level safety culture, activities in this task force are centred on the collection and analysis of hydrogen safety-related data to derive lessons learned and provide further general recommendations to all stakeholders.

EHSP activities over 2022 will continue on the assessment of safety data end events in HIAD2.0 with the addition of new events, including events from countries such as Japan and China, as well as from incidents registered in the H2Tool, which are also in the public domain. In close collaboration with the JRC, the EHSP members will complete and update the review and assessment of the events and the lessons learned and statistics obtained from this information and will issue a new release of the document “Statistics, lessons learnt and recommendations from the analysis of the Hydrogen

---

<sup>28</sup><https://www.fch.europa.eu/page/european-hydrogen-safety-panel>

<sup>29</sup>[https://www.fch.europa.eu/sites/default/files/documents/Safety\\_Planning\\_Implementation\\_and\\_Reporting\\_for\\_EU\\_Projects-Final.pdf](https://www.fch.europa.eu/sites/default/files/documents/Safety_Planning_Implementation_and_Reporting_for_EU_Projects-Final.pdf)

Incidents and Accidents Database (HIAD 2.0)<sup>30</sup>, last published in 2021. This new release will also include an in-depth analysis of some specific sectors in line with the EHSP workshops to be organised by task force 1 as well as failing components in all the events.

Last, a set of activities on reviewing the contribution and research progress in the field of hydrogen safety will be performed. This work was initiated in 2021, and the activities in 2022 are envisaged to encompass:

- Enlarge and enrich the list (compiled in 2021) of engineering models and risk assessment approaches with brief comments and/ or recommendations, including clarifying if already available in the e-library.
- Enlarge and enrich the list (compiled in 2021) of CFD models with brief comments and recommendations.

Based on these works, a guidance document on Hydrogen Safety Analysis will be issued, including references to the engineering, risk and CFD tools above mentioned.

#### TF.4 Public outreach

This task force focuses on the broad exchange of information with relevant stakeholders, including the public. The activities in 2022 will focus on updating and expanding the content on the EHSP web page, including a set of Frequently Asked Questions (FAQs) on hydrogen safety, updated lists of events and resources, etc. The EHSP will also deliver oral or poster presentations at relevant safety, fuel cell and/or hydrogen technology conferences, organise workshops with relevant stakeholders (either as public outreach from TF4 or targeting specific FCH 2 JU projects in TF1), and work in close cooperation with the Communication Team at FCH 2 JU.

---

<sup>30</sup> <https://www.fch.europa.eu/sites/default/files/documents/Lessons%20learnt%20from%20HIAD%202.0-Final.pdf>

## *E. Knowledge management. Dissemination and exploitation of projects results*

### E.1 Knowledge Management

Technology and programme monitoring will continue with the annual data collection exercise from projects, in the internally developed data collection platform TRUST (Technology Reporting Using Structured Templates)<sup>31</sup>. Following its successful development and use, projects will be invited similarly to provide their data in 2022 concerning results generated in 2021. Data collected, will allow to benchmark project progress against State of the Art (SoA) and FCH 2 JU targets as defined in the MAWP 2014-2020 (and its Addendum)<sup>32</sup> and related AWP. In addition, the annual iterations of the data collection exercise have enabled the development of a time-dependent database of FCH 2 JU project results.

In that respect, each project active in the year 2021 (previous year to the exercise) will be asked to complete one or several questionnaires concerning the data obtained within the activities foreseen in the description of action/work. The questionnaires are assigned to the projects according to the type of technologies concerned and the activities carried out. In 2021, 23 different questionnaires were used (so called “templates”)<sup>33</sup>. Within each questionnaire, several parameters either descriptive or operational should be filled and each of them can individually be tagged as public or confidential. The FCH 2 JU is committed to respect data confidentiality (according to the conditions setup by the Grant Agreement) and will only use them in the respect of this attribute: confidential data will not be disclosed as such, but only in aggregated form (following a clean-room approach), and in a manner that ensures anonymity of their origin. Progress and findings that can be shown will be made public (normally associated to the Programme Review exercise – see below).

At the same time, FCH 2 JU will review in detail the capabilities offered by TRUST, to examine whether these tools cover sufficiently the needs of FCH 2 JU, both today and in the future. The sufficiency and analytical capabilities of the technology monitoring tools in the possession of FCH JU will be critical in the future, especially in anticipation of the new Clean Hydrogen Partnership, as proposed by the European Commission. To this end, it may prove necessary to proceed to yet another upgrade of the existing tools or even the procurement of a new tool, based on the work already done in the context of the two aforementioned tools.

JRC will continue supporting FCH 2 JU in its knowledge management activities by different means. It will support technology monitoring and assessment of the FCH JU project portfolio and perform a historical analysis on the project portfolio of FCH JU and FCH 2 JU on the state of the art of FCEV, hydrogen buses and hydrogen fuelling stations. JRC will also continue to adapt the JRC Tools for Innovation Monitoring (TIM) to the needs of the FCH 2 JU, ensuring its maintenance, operation and extension as necessary. As in previous years, JRC will perform a full programme review cycle for the year 2022, in the form of an internal report. Finally, as in previous years, JRC will perform a full programme review cycle for the year 2022, in the form of an internal report.

The internal database containing overall plans and deployments in EU will continue to be maintained and updated by the FCH 2 JU. This database is fed with information from projects and from general/specific press concerning plans and deployments of FCH technologies, such as electrolysers,

---

<sup>31</sup>[https://www.fch.europa.eu/sites/default/files/documents/TRUST\\_ExplanationFile\\_Draft\\_2019%20%28ID%205709356%29%20%28ID%205833842%29.pdf](https://www.fch.europa.eu/sites/default/files/documents/TRUST_ExplanationFile_Draft_2019%20%28ID%205709356%29%20%28ID%205833842%29.pdf)

<sup>32</sup> <https://www.fch.europa.eu/page/multi-annual-work-plan>

<sup>33</sup> <https://www.fch.europa.eu/projects/knowledge-management>

vehicles, hydrogen refuelling stations and stationary units, including detailed information on country, size, technology etc. Information for other parts of the world may also be included for benchmarking. In particular, for cars, this should be complemented with reference to fuel cell car deployment figures (passenger car data only) from the European Automobile Manufacturers Association (ACEA) recorded on a quarterly basis, as obtained from ACEA directly. Vehicle sales figures are also captured every 6 months from the vehicle manufacturers themselves.

The FCH 2 JU also contributes towards the monitoring of the deployment of hydrogen technologies, the adoption of related policies and academic activities and research results through the Fuel Cells & Hydrogen Observatory (FCHO)<sup>34</sup>. FCHO is an open platform providing data and up to date information about the entire hydrogen sector, aiming to address the lack of data publicly available at EU and national level concerning the uptake of fuel cell and hydrogen technologies on the EU market and the absence of a coordinated methodology on how to monitor their market evolution.

## E.2 Dissemination and exploitation of projects results:

All activities related to the dissemination and exploitation (D&E) will be in line with the European Commission's strategy for dissemination and exploitation of the projects results<sup>35</sup>. According to the D&E Strategy for the post-H2020 period and the Horizon Europe, the governance structure for implementation will consist of the following coordination groups:

- The Horizon Dissemination & Exploitation Group, and
- The Horizon Feedback to Policy Group.

FCH 2 JU is planning to continue actively participating in these working groups, as well as using the corporate data/text mining tool (CORTEX) to facilitate implementation of the new framework for the feedback to policy.

Furthermore, as also depicted in the Dissemination and Exploitation Strategy for Horizon Europe, an ecosystem of services and tools has been established to enhance circulation of knowledge stemming from R&I projects:

- Horizon Results Booster<sup>36</sup>: A package of tailor-made specialised services to maximise the impact of R&I public investment and further amplify the added value of the Programme, by building the capacity of projects for disseminating research results, increasing their potential for exploitation and improving access to markets;
- IP Booster<sup>37</sup>: Specialised professional Intellectual Property service for public research organisations looking to realise value from their research results;
- Horizon Results Platform<sup>38</sup>: A result-oriented platform for project beneficiaries to upload their results, to valorise and promote them to the targeted groups (e.g. business partners, angel investors, venture capitals, policy makers, business development assistance etc);

---

<sup>34</sup> <https://www.fchobservatory.eu/>

<sup>35</sup> Dissemination & Exploitation Strategy for Horizon Europe - Towards an Integrated Dissemination & Exploitation Ecosystem, European Commission, DG-RTD, 2020

<sup>36</sup> <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/d-e-booster>

<sup>37</sup> <https://ipbooster.meta-group.com/>

<sup>38</sup> <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform>



- Innovation Radar<sup>39</sup>: A European Commission initiative to identify high potential innovations and innovators in EU-funded research and innovation projects, based on a data driven method;
- Dealflow.eu<sup>40</sup>: Mainly addressed to innovations analysed by the Innovation Radar, this package of services aims to support EU-funded start-ups in commercialising their innovations and connect them with investors and corporates (fundraising, venture building and networking).
- Open Research Europe<sup>41</sup>: The new EC scientific publishing service for fast publication and open peer review for research scientific articles stemming from H2020 projects.

As part of the knowledge management activities but also in the context of the Project Management workflow, the Programme Office will keep on encouraging the projects not only to implement their D&E plans, to update and revise them when necessary, but also to try to benefit from the opportunities provided by the D&E ecosystem to facilitate and enhance their D&E activities during and after the end of each project, focusing especially on the exploitation efforts of the key exploitable results. This provision is valid during and after the end of the funding cycle of the projects (practically for the ongoing H2020 projects), as foreseen in the MGA.

Since 2018 when the FCH 2 JU participated in the pilot of the Innovation radar, the Programme Office will continue to participate in this innovation repository. The Innovation Radar exercise has so far been conducted during mainly the project mid-term reviews where a dedicated expert is mandated to identify potential innovations and is required to fill out a questionnaire with the aim of providing information in a structured and quantified way. The Innovation Radar exercise is currently incorporated in the internal workflows, which gives the flexibility to the project officers to update existing or submit questionnaires for new innovations that happen up to the final reporting even without the use of an expert to contribute in the process; the Programme Office will assess whether this new feature can be applied successfully and effectively to flag innovations of our projects that comes later in the project lifecycle, but without experts.

Furthermore, the identified innovations/innovators can be supported for further exploitation and dissemination. One concrete example of this is Deaflow.eu, a new action supported by the European Union's Horizon 2020 Research and Innovation Program to help projects commercialize their innovations ("go to Market"), by facilitating access to clients and investors and providing high-end coaching services. The service gives priority to the projects that are already analysed by the Innovation Radar. Additionally, during the Innovation Awards organized each year during the Programme Review Days, the top-ranking annual innovations extracted from the Innovation Radar are presented to the public vote.

Continuing the good experience and practice so far, the 12<sup>th</sup> annual Programme Review Days will be organised in autumn 2022 (Q4 of 2022). The review will be carried out with the support of JRC and will be reflected in the Annual Programme Review Report (see section B above). Initiated in 2011, this annual exercise, managed by the FCH JU with the support of JRC, provides feedback on the progress of the portfolio of projects funded by the H2020 (mainly FCH 2 JU projects but also other EU funded projects with synergies), identifying key achievements but also potential areas to be addressed or

---

<sup>39</sup> <https://ec.europa.eu/digital-single-market/en/innovation-radar>

<sup>40</sup> <https://dealflow.eu/>

<sup>41</sup> <https://open-research-europe.ec.europa.eu/>

reinforced in subsequent years. The exercise also provides an excellent visibility platform for projects and technological developments achieved in the sector. Furthermore, the Best Success Stories and the Best Innovation Awards is an additional activity to highlight the results of collaboration between research, industry and policy makers, and projects achievements.

## *F. Support to EU policies, regions and Member States and Funding/financial engineering*

### F.1 Support and input to EU policies

The FCH 2 JU is contributing to the activities of several services in the European Commission (EC). Contributions vary in content and format, but the common goal is to provide fact-based information on the state-of-the-art of fuel cells and hydrogen technologies and their contribution to the EU initiatives and policies especially in the energy, transport and industry sectors as well as to competitiveness and growth.

In practical terms, this means taking part in a number of technical groups organised by the EC and other international bodies, active participation in the meetings, providing written technical input and ensuring that fuel cells and hydrogen technologies are properly represented. It also includes feedback from projects and studies to the EC in contribution to relevant energy, transport and clean air policy files.

In 2022, the FCH 2 JU Programme Office will continue to reinforce the collaboration with policy makers in the European Commission by providing input, under ad-hoc requests or in a more structured manner. The new Framework for Feedback to Policy<sup>42</sup> is the main initiative to support evidence-informed policy design and evaluation. Prepared and piloted by the Common Implementation Centre, the new Framework is expected to support and coordinate the process within the Climate, Energy and Mobility cluster<sup>43</sup> in Pillar II of the Programme, as soon as the new structure with the establishment of the Joint Teams and the new processes and tools to support implementation is set. Considering the dense climate and energy policy framework at EU level, further reinforced by the recent Fit-for-55 package adopted in summer 2021, the FCH 2 JU expects frequent interactions and a high level of requested contributions in this context.

The Fuel Cells and Hydrogen Observatory<sup>44</sup> (FCHO) maintained by the FCH 2 JU is also an important resource in the context of the feedback to policy, containing useful information on hydrogen technologies, deployment, policies, funding and research-related information (publications, patents and trainings)<sup>45</sup>.

Example of specific feedback to policy activities planned for 2022 are described in the sub-sections below. These will be complemented by other actions in response to ad-hoc requests of the European Commission. Additional activities maybe required also under the forthcoming Clean Hydrogen Joint Undertaking once its mandate is clarified.

### F.2 Hydrogen Guarantees of Origin

Since 2014, the FCH 2 JU has been working on developing a Guarantee of Origin (GO) Scheme for Green and Low-Carbon Hydrogen under the “CertifHy” project<sup>46</sup>. Since then, the third phase of work (CertifHy3) has started. CertifHy3 intends to accelerate the establishment of harmonised and mutually recognised Guarantees of Origin Schemes for renewable and non-renewable hydrogen across Members States, by sharing the lessons learned from the CertifHy GO pilot scheme operation while ensuring compliance to article 19 of the RED II<sup>47</sup>.

---

<sup>42</sup>

[https://ec.europa.eu/info/sites/default/files/research\\_and\\_innovation/strategy\\_on\\_research\\_and\\_innovation/documents/ec\\_rtd\\_implementation-strategy\\_he.pdf](https://ec.europa.eu/info/sites/default/files/research_and_innovation/strategy_on_research_and_innovation/documents/ec_rtd_implementation-strategy_he.pdf)

<sup>43</sup> [https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-5-climate-energy-and-mobility\\_en](https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-5-climate-energy-and-mobility_en)

<sup>44</sup> <https://www.fchobservatory.eu/>

<sup>45</sup> For more information, see Section 3.2.E.

<sup>46</sup> <https://www.certifhy.eu/>

<sup>47</sup> Renewable Energy Directive II (REDII)

An important objective of CertifHy3 is to support the design of a RED II compliant Voluntary Scheme, with the aim to get it recognized by the EC, for demonstrating compliance with targets on the share of renewables in transport or heating & cooling, following the specific requirements that are applicable in each case. Close collaboration between the FCH 2 JU and European Commission on this work will continue in 2022 (having EC already represented in the steering group of CertifHy3).

### F.3 Continuous support to the SET Plan

The FCH 2 JU will continue following and contributing as necessary to the European Strategic Energy Technology Plan (SET-Plan)<sup>48</sup> activities, in particular Action 6 “Energy Efficiency for Industry” and Action 8 on “Renewable Fuels”. The FCH 2 JU is also taking part to the Sustainable Transport Forum Expert Group and its sub-groups, concerning the strategic rollout plan for alternative fuels infrastructure.

### F.4 Support to transport policies

On the maritime sector the collaboration with European Commission services and EMSA<sup>49</sup> on regulatory aspects (safety, standardisation, regulation) related to hydrogen as a maritime fuel will continue. Particularly in 2022, this will be underpinned with the work planned under the FCH 2 JU study “Hydrogen in Ports and Industrial Coastal Areas”.

During 2022, a study supported by the FCH 2 JU on “Impact of Deployment of Battery Electric Vehicles (BEV) and Fuel Cells Electric Vehicles (FCEV) Infrastructure” should be finalized. The study aims at defining the optimal blend between electric recharging and hydrogen refuelling infrastructure through a comprehensive analysis. The results should help to determine strategies for the deployment of both electric charging and hydrogen refuelling infrastructure. Representatives of the industry as well as of the European Commission are involved in the steering group ensuring that all relevant stakeholders can contribute and that policy recommendations emerging from the study are taken on board by policy makers.

### F.5 Support to Industrial Policy

The FCH 2 JU remains ready to support DG GROW and cooperate with the European Clean Hydrogen Alliance<sup>50</sup> activities (the final scope of these activities will be clarified once the Council Regulation establishing the Joint Undertakings under Horizon Europe is adopted later in 2021).

### F.6 Greening European Islands

To foster the adoption of FCH solutions as a means to decarbonise islands, the FCH 2 JU intends to share the outcomes and learnings of the GreenHysland<sup>51</sup> project with the Commission services responsible of the Clean energy for EU islands initiative<sup>52</sup>.

FCH 2 JU will continue in 2022 to collaborate closely with the EC representatives in the steering committees of a number of international agreements/associations. For more information refer to the section on “International Collaboration”.

---

<sup>48</sup> <https://ec.europa.eu/energy/en/topics/technology-and-innovation/strategic-energy-technology-plan>

<sup>49</sup> European Maritime Safety Agency (<http://www.emsa.europa.eu/>)

<sup>50</sup> [https://ec.europa.eu/growth/industry/policy/european-clean-hydrogen-alliance\\_en](https://ec.europa.eu/growth/industry/policy/european-clean-hydrogen-alliance_en)

<sup>51</sup> <https://greenhysland.eu/>

<sup>52</sup> [https://ec.europa.eu/energy/topics/markets-and-consumers/clean-energy-eu-islands\\_en](https://ec.europa.eu/energy/topics/markets-and-consumers/clean-energy-eu-islands_en)

## F.6 Collaborations with other agencies and joint undertakings

The FCH 2 JU will remain proactive in taking up opportunities for collaboration with other Joint Undertakings, EU agencies, initiatives and actions with the potential for synergy with its research agenda. Examples of past collaborations include joint studies with other Joint Undertakings and synergies with other European Union funded programmes including the Transport Challenge of H2020, the Connecting Europe Facility for Transport (CEF-T) and Interreg programmes. Exchanges of the FCH 2 JU in 2022 will also extend to the Executive Agencies in charge of managing other parts of Horizon 2020 in areas relevant to fuel cells and hydrogen technologies. On the energy sector the FCH 2 JU and CINEA will continue to explore potential synergies and areas of collaboration, especially on fuel cells for stationary applications and hydrogen production and storage. On the transport sector, the FCH 2 JU continues collaborating with CINEA<sup>53</sup> (under both H2020 and CEF-T<sup>54</sup> programmes) on activities related to heavy duty transport applications and Hydrogen Refuelling Stations (HRS).

In addition, the FCH 2 JU will continue collaborating with the European Defence Agency<sup>55</sup> (EDA) with the objective to foster the adoption of FCH solutions for dual use technology applications.

As needed, the FCH 2 JU will continue to collaborate with other European bodies and agencies (under the coordination of the policy DGs in the EC) in view of improving the exchange of information and generating synergies between different initiatives, thus reducing the risk of duplication within areas that are of common interest.

## F.7 Supporting regions and Member States through funding/financial engineering

### *Hydrogen Valleys*

Over recent years, the Hydrogen Valley concept has emerged as a firmly established term in the European funding and collaboration landscape. Building on the FCH 2 JU Regions and Cities Initiative launched in 2016, a "European Hydrogen Valleys partnership" was created under the "Smart Specialisation for Industrial Modernisation" framework of the European Commission. In parallel, the FCH 2 JU awarded two European regions dedicated funding to pursue their tailor-made Hydrogen Valley concepts (H2Valley and H2Island under the 2019 and 2020 calls respectively), projects that it will continue to support and monitor in 2022. With the goal of raising the concept further at the regional level and bringing more Regions up to speed in developing hydrogen economies at the local level, FCH 2 JU launched also a pilot Project Development Assistance (PDA) for Regions, which finished in June 2021. The latter assisted 11 regions, of which 5 from Central and Eastern Europe MS, effectively contributing to bring new regions up to speed with the technology maturity of FCH products and generating new H2Valleys across Europe.

Funding/financial engineering activities at the FCH 2 JU are an integrated component of these activities with MS and Regions, enabling the development of large-scale sectoral integrated projects under the Hydrogen Valleys concept.

---

<sup>53</sup> Innovation & Networks Energy Agency (<https://ec.europa.eu/inea/en/welcome-to-innovation-networks-executive-agency>)

<sup>54</sup> Connecting Europe Facility (CEF)

<sup>55</sup> European Defence Agency (<https://www.eda.europa.eu/>)

### *Technical assistance for Member States and European regions<sup>56</sup>*

Building on the momentum, in 2022 the FCH 2 JU intends to pursue the three procurements launched towards end of 2021. These three procurements will be the key funding and financial engineering activities of the JU, continuing to raise the uptake of projects' results by MS and Regions, ensuring effective cooperation between different stakeholders and pooling of funding and financing resources:

- *'Technical assistance support to generate synergies with Member States/Regions'* – Building on previous study performed in 2020 by FCH 2 JU on 'the role of hydrogen in the National Energy and Climate Plans (NECPs)<sup>57</sup>, opportunities were identified arising from the inclusion of hydrogen energy technologies in the NECPs. As a next step, a public procurement shall work in 2022 with at least 10 MS/Regions to identify relevant ESIF, Recovery funds, etc. and structure cooperation with Managing Authorities (MA) in order to assess possibilities for exploitation of results from FCH 2 JU projects into national/regional projects and synergies. By generating synergies with other EU/recovery, National and Regional Funds, the FCH 2 JU intends to boost the realisation of various H2 roadmaps and support indirectly the objectives in the NECPs;
- *'Project Development Assistance (PDA) for Regions II - Cohesion Countries, Outermost Regions and Islands'* - This procurement will provide PDA support to bring projects to a high level of preparedness for approx. 25 regions' projects & create Observers' Network(s) of inter-island, inter-regional and cross city networks to generate specific blueprints. It shall raise awareness of relevant Regional and National ESIF Managing Authorities. The work will build on successful PDA which core activities lasted until June 2021<sup>58</sup>;
- *'MI2.0 H2Valley Platform'* - In 2019, the European Commission (through the FCH 2 JU) and Mission Innovation launched the Hydrogen Valley Platform<sup>59</sup> to facilitate the emergence and implementation of large-scale hydrogen projects and share the knowledge where IPR issues are less sensitive. This platform gathers information on more than 30 Hydrogen Valleys from 20 countries. In addition to access to basic information on these projects, the platform facilitates international cooperation of EU Member States and Associated Countries in the context of Mission Innovation especially through projects collaboration with similar worldwide activities. Building on the success of this initiative and on the growing interest for developing Hydrogen Valleys around the World, the FCH 2 JU will launch later in 2021 the second phase of the Hydrogen Valleys Platform. In 2022, this new "H2.0 Valley" platform will include enhanced features to propose additional services to members of the Mission Innovation, increase the visibility of Hydrogen Valleys among the public, boost the development of new projects and accompany the progress of them, from plans to effective deployment.

---

<sup>56</sup> Additional activities with Member States and Regions, as well as on financial engineering, may emerge once the Council Regulation establishing the Clean Hydrogen Joint Undertaking is adopted later in 2021.

<sup>57</sup> <https://www.fch.europa.eu/publications/opportunities-hydrogen-energy-technologies-considering-national-energy-climate-plans>

<sup>58</sup> <https://www.fch.europa.eu/publications/fch-ju-project-development-assistance-public-pda-summary>

<sup>59</sup> <https://www.h2v.eu/hydrogen-valleys>

### *G. International Cooperation*

The recent Communication of the European Commission on the global approach to research and innovation<sup>60</sup> presents the EU's new strategy on international cooperation on research and innovation. The EU aims to take a leading role in supporting international research and innovation partnerships and to deliver innovative solutions for making our societies green, digital and healthy.

The strategy builds on two principal objectives: preserving openness in international research and innovation cooperation, while promoting a level playing field and reciprocity underpinned by fundamental values.

In line with these objectives and in order to better support and European Commission to align with, facilitate and accelerate worldwide market introduction of fuel cell and hydrogen technologies the FCH 2 JU continuously tries to identify priority areas, at policy and technology level, where coordinated and collaborative international activities are of interest.

As the deployment of fuel cells and hydrogen technology is carried out globally and key stakeholders of the FCH 2 JU are involved in these developments, establishment of links with other major FCH related programmes globally is deemed important. This is particularly valid during 2022 in areas of cross cutting nature such as regulatory and policy frameworks (for example issues with harmonisation of regulations for maritime applications), codes, standards (for example pre-normative research on refueling protocols or impact of hydrogen admixtures in the natural gas networks), safety or education (for example training of responders). These areas play a very important role in early market activation and where intellectual property rights are less of an issue.

On a more general level, the relevant international activities of interest include in particular those carried out by the IEA under the Hydrogen Technology Collaboration Program (TCP) (IEA Hydrogen)<sup>61</sup>, Technology Collaboration Programme on Advanced Fuel Cells (IEA AFC) and IPHE<sup>62</sup>. The FCH 2 JU will hence continue in 2022 to collaborate closely with the EC representatives in the steering committees of these international agreements/associations, in particular within the working-groups on 'Renewable Hydrogen', 'Hydrogen Underground Storage', 'Hydrogen Export Value Chains' and on 'Data and Modelling'.

Following the successful and close collaboration of the FCH 2 JU with EC representatives on the Mission Innovation – IC8 and the setting up of the Hydrogen Valley Platform, a platform for exchanges between worldwide initiatives on hydrogen valleys, the FCH 2 JU will continue to contribute in this direction. It will maintain and further improve the Hydrogen Valleys platform, while contributing also towards the other activities of Clean Hydrogen Mission under MI2.0, aiming to make clean hydrogen cost competitive to the end user by reducing end-to-end costs by 2030. In this context, the FCH 2 JU will support the European Commission in its co-lead activities (see also administrative procurements).

---

<sup>60</sup> Europe's strategy for international cooperation in a changing world, COM(2021) 252 final.

<sup>61</sup> <http://ieahydrogen.org/>

<sup>62</sup> <http://www.iphe.net/>

#### *H. Operational Procurements (studies)*

There are no new planned (operational) activities to be carried out via calls for tenders (i.e. public procurement) in 2022.



## **Conditions for the Call**

N/A

## **2.3 Call management rules**

N/A

## 2.4 Support to Operations

### Communication and Outreach Activities

#### *Overview*

Communication activities will support the priorities identified in the current AWP and will ensure that all stakeholders will continue to be duly informed about the results of the FCH 2 JU.

Strategic communication to all stakeholders and an increased outreach effort to the general public with intensified awareness campaigns will be key for a successful communication by the JU in 2022 towards the next JU mandate too.

FCH 2 JU communication will focus mostly on the programme “legacy” aspects – i.e. promotion of ongoing projects, programme achievements and success stories, while highlighting the characteristics of FCH 2 JU and its overall role for the development of a hydrogen economy in Europe.

FCH 2 JU projects have accelerated Europe’s technological lead, notably on electrolysers, hydrogen refuelling stations and megawatt-scale fuel cells. Proactive and evidence-based communication is critical to increase visibility and positive narrative in these areas and raise awareness about the market readiness of the technology.

During the past years, FCH 2 JU has built up its communication around programme success stories to demonstrate the benefit of the instrument and the impact of its results. This approach will continue during 2022, especially during the transition to the next JU.

The stories about the technology, the journey and the successes are a powerful narrative. However, considering that hydrogen technologies are a highly technical and scientific topic, their outreach can be improved by engaging with new target groups, such as SMEs, regional authorities and municipalities, and by enhanced cross-promotion across sector, such as the transport sector, the agricultural sector, academia.

#### *Communication objectives*

1. Ensure a smooth transition from the FCH 2 JU to the Clean Hydrogen JU;
2. Showcase the FCH 2 JU programme achievements progress and benefits by continuing the promotion of ongoing FCH 2 JU projects and initiatives and their results.

Communication activities will therefore focus on how the programme delivered results that have a strong impact and translate into concrete benefits for European industries, authorities on all levels and European citizens – and that constitute the building block for the next partnership.

#### *Target audiences*

- Policy-makers: EU Institutions (European Commission, European Parliament, Committee of the Regions, Council of the EU), individual Member States (relevant representatives of governments and permanent representations), municipalities and regional authorities;
- FCH stakeholders and their governance structure: European Clean Hydrogen Alliance, European Commission, Hydrogen Europe, Hydrogen Research, National Contact Points, technical experts, associations;
- FCH 2 JU beneficiaries;
- General public (see below).

### *Main communication themes*

FCH 2 JU will continue to deliver clear, accurate, up-to-date and consistent messages that resonate with a variety of audiences, from policymakers to researchers and industry. Communication themes will focus on:

- Ensure continuity and work towards a smooth transition to the next JU;
- Projects' results and success stories: highlight concrete benefits for the European citizens, socio-economic benefits, benefits and involvement of SMEs;
- Innovative concepts and initiatives: EU Hydrogen valleys, Fuel Cells and Hydrogen Observatory (FCHO), Project Development Assistance (PDA), flagship projects in key areas relating to heavy-duty transport, shipping industry, maritime transport, aviation etc;

### *Communication and outreach activities*

#### **Success stories**

FCH 2 JU's communication will promote the successful results of its projects, through:

- Collaboration with the communication unit of the European Commission's Directorate-General for Research and Innovation, responsible for services such as the Horizon Magazine, Futuris and the webpage for EU research success stories.
- Continued collaboration with H2View 's 'Pillars of Progress' series, whose articles are based on the content of the FCH 2 JU Success Stories .
- The promotion of short promotional videos which tell the success stories about the programme through its projects.

#### **Website**

The main communication tool of the programme, the website <https://www.fch.europa.eu/> will remain available during the year 2022, allowing easy access to the information about the activities and the results of FCH 2 JU. Information about FCH 2 JU projects will be updated while ensuring the transition to the next JU website.

#### **Social media**

The FCH 2 JU Twitter, LinkedIn and You Tube accounts will continue to be used in 2022, while ensuring the transition to the new accounts of the next JU.

#### **Visual Identity**

The FCH 2 JU visual identity will be visible via its projects and website, while new visual may be developed for the next JU (in line with the European Commission guidelines for partnerships under Horizon Europe).

### *External communication support*

Participation in communication framework contracts will be continued in 2022.

### *Monitoring and measuring impact of communication activities*

The impact of the FCH 2 JU communication efforts will be measured using the Europa Analytics reports for website performance, and default social media analytics available on each of the platforms, namely Twitter, LinkedIn and YouTube.

## Administrative Procurements and contracts

FCH 2 JU allocates part of the administrative budget to procure the necessary services and supplies needed to support its operations and infrastructures.

As a good-practice, the FCH 2 JU will continue seeking to join inter-institutional tenders either launched by the European Commission (EC) or in agreement with other Joint Undertakings.

In order to maximize effectiveness and cost-efficiency in procurement, the JU is already using a wide range of eProcurement solutions: eTendering (for preparing and managing a call for tenders), eNotices (for the publication of calls for tenders), eSubmission (for receiving and opening tenders) and eInvoices (for the electronic reception of commercial invoices). The Programme Office will closely monitor any developments in eProcurement with a view to further optimize its business processes.

Moreover, the FCH 2 JU deployed and uses EU Sign, the e-solution providing a qualified electronic signature, equivalent of blue ink signatures, in an effort to align with the Commission's Digital Strategy driven by the 2019-2024 priorities of President von der Leyen, which set out a vision for the European Commission to lead by example in digital transformation. In addition, contract management reporting has become more efficient with the use of ABAC<sup>63</sup> LCK.

FCH 2 JU expects to be invited in the following procedures in 2022:

- External services for onsite and offsite development
- Provision of Audiovisual production services
- Advice, Benchmarking and Consulting services in information and communication technology
- Graphic design services
- Event management and conference assistants

In addition, FCH 2 JU may launch the following procedures:

Subject	Indicative budget (€)	Expected type of procedure	Indicative launch date
Service Contracts for support activities, including support to Mission Innovation <sup>64</sup>	425,000	open	Q1
Managed IT services	To be confirmed following a market research	open	Q2
Leasing of an additional hydrogen powered car	50,000	negotiated	Q3
Renewal of UPS maintenance and batteries replacement (for JU server)	20,000	negotiated	Q3

<sup>63</sup> Accrual Based Accounting system provided by the European Commission

<sup>64</sup> May be implemented through different budget lines, if needed

## IT and logistics

### *Document Management, digital transformation and information management*

The Joint Undertaking overall objective is to lead by example in digital transformation. This transition is clustered on the following pillars:

- paperless, streamlined procedures that use technology to remove mechanical tasks,
- improved access to and use of data to work more efficiently and be more transparent,
- staff collaborating efficiently and easily anytime, anywhere and with all stakeholders.

In addition, the Joint Undertaking will exploit the potential of data, information, knowledge and content management for running the program, communication to citizens and stakeholders and best staff engagement.

The Joint Undertaking will build a performing digital infrastructure and a fit-for-purpose Digital Workplace and will deliver modern, trustworthy, efficient, and transparent IT Governance.

The Joint Undertaking will strive to improve its environmental impact in all its actions and will actively promote measures to reduce the related day-to-day impact of the administration and its work.

In 2022, these overall objectives will be supported with the following specific actions (per area):

#### **Document Management**

- Registration of the documents linked to Grants in the FCH 2 JU filing plan,
- Phasing out of our current archiving system “M-files”,
- Application of the Administrative Retention Policy (ARP) on physical files: elimination, historical archives and digitalisation of those for which the ARP is still running.

#### **Information Management**

The Joint Undertaking will continue to use or adopt **flagship digital solutions** developed by DIGIT, such as for example: SYSPER, ARES, eProcurement, eGrants, Next-EUROPA.

The following implementations to complement the IT tool Hermes-ARES-NomCom already adopted as document management system are foreseen for 2022:

- **AresBridge** in our recent Microsoft 365 SaaS to facilitate the registration and filing of documents;
- A dedicated **FCH digital seal** to make the Qualified Electronic Signature process leaner and fully integrated in ARES.

In 2022, the JU will further develop the digital solutions already available to facilitate the interaction with internal actors.

To that effect it is foreseen to develop:

- Dedicated collaboration platform using **Sharepoint** and develop the new intranet;
- Reinforce our web presence with a **new website compliant with the Europa Web Publishing Platform (EWPP)** hosted under the Next-EUROPE platform.

#### **Digital Transformation Management**

The **digital workplace** for each staff member will be modernized :

- Each staff member will be equipped with new modern IT equipment allowing for more flexibility under the new teleworking working scheme;
- The support services will be oriented to **more self-service functionality** to fit the remote working capabilities (reset password/account, remote deployment of applications, ...);
- The use of **cloud services and storage** will be encouraged (Onedrive, remote desktop);
- The meeting rooms and staff computer will be equipped to support the ability to participate in calls, videoconferences, and other collaborative workgroup from anywhere at any time.

### **Cybersecurity**

The cybersecurity will be reinforced by the implementation of the new Infosec regulation and the future dedicated role of Cyber Security Officer.

### **IT Governance**

The **IT Governance** will be further developed by renewing, extending or creating Service Level Agreements for the common digital infrastructure to improve synergies and efficiencies among the new Joint Undertakings. The IT Officer will also continue to join any added-value interinstitutional framework contracts or inter-agency joint procurement.

The **digital infrastructure**, will continue to rely on the secure pan-European networks for the Commission, executive agencies and other European institutions. The common conference center of the White Atrium building will be up-scaled with the necessary audio-visual functions to held hybrid meetings.

### **Sound environmental management**

The Joint Undertaking plan to **transform the program office into a safe, modern and welcoming place to work**, with good quality, sustainable and green solutions.

Year 2022 will contribute to the delivery and implementation of:

- remote work as integrated way of working;
- more dynamic approaches to the use of office space;
- the use of modern technologies (such as “more wireless, less cables”, Wi-Fi everywhere, connected meeting rooms);
- the use of web/videoconferencing-based meetings as valid sustainable alternative to staff missions and physical meetings, which represents a significant benefit in terms of environmental footprint, efficiency, and work-life balance.

## **JU Executive Team – HR matters**

### *JU Executive Team*

The Executive Director is the legal representative of the FCH 2 JU and the chief executive responsible for the day-to-day management. He is supported by the Programme Office (PO), composed of temporary and contract agents.

The PO implements all the decisions adopted by the GB; provides support in managing an appropriate accounting system; manages the calls for proposals; provides to the Members and the other bodies of the FCH 2 JU all relevant information and support necessary for them to perform their duties as well as responding to their specific requests; acts as the secretariat of the bodies of the FCH 2 JU and provides support to any advisory group set up by the GB.

In 2022, in the context of the transition to the new Clean Hydrogen Partnership and following pandemic and new way of working methods, organisational chart may be revised to ensure effective use of resources.

#### *HR matters*

The priority objectives in the field of Human Resources are to ensure that the Staff Establishment Plan is filled, to ensure an efficient management of staff resources and to ensure an optimal working environment.

This is achieved mainly through efficient selection procedures, staff performance appraisals and reclassifications, learning and development opportunities, promotion of open communication and inter-JU cooperation.

In 2022, special focus will be put on the following:

- Preparation and update of the job descriptions in a new JIS module in SYSPER (available for a use since 19 October 2021) as a top priority;
- Completion of the personnel files using NDP 'Numérisation Dossiers Personnels' of all (past and current) staff members in Sysper;
- Updating of the newcomers pack for permanent staff, for the trainees, interim staff; and establishment of the newcomers pack for service contract consultants;
- Ensuring that all new staff will follow a mandatory training on 'Ethics and Integrity',
- Implementation of the EC tool MIPS to be used for missions,
- Preparation of the internal procedure on staff handover process and checklists for staff members leaving the organisation.

In line with the EC priorities for 2019 -2024, and following the pandemic, FCH 2 will continue to promote:

#### ***Gender and geographical balance***

Diversity aiming at ensuring geographical balance where possible and gender balance will be important considerations in selection procedures, without compromising competency-related criteria.

#### ***Development and Talent management***

It is important for staff members to be able to follow trainings to improve their work skills but it is as important to work on talent management, meaning that staff members can develop their skills in subjects of interest not necessarily related to the current job.

#### ***New ways of working and Wellbeing***

Home office equipment and work equipment need to be compatible, upgrade for IT office equipment is foreseen for the near future.

#### ***Encourage and create synergies between JUs***

The JUs will create more synergies amongst them, especially in areas as HR. Trainings and workshops in the interest of all staff members can be organized together.



## Administrative budget and finance

The main objective for Finance and Budget is to ensure a sound financial management of the Programme Office resources.

This is mainly achieved through the alignment of planned activities with budgeted resources, the establishment of commitments for respecting legal obligations, the payment execution for goods and services delivered, the management of subsidies and revenues and the monitoring of the budget execution.

In 2022, activities will focus on the following:

- Ensure efficient budget forecast and maintaining a high level of accuracy in budgetary forecasting; to this perspective, the spending pace of the grants with the highest budget will continue to be closely monitored and checked against the forecast that their consortia has been provided;
- Prepare 2023 and any modifications to 2022 budget following the approval of mandate in liaison with DG R&I and DG BUDG;
- Report on 2021 budget execution and financial management;
- Prepare monthly reports containing key elements to budget execution and sound financial management (payment delays, budget execution, state of play for procurement procedures);
- Ensure transactions are financially and procedurally correct, that is, in conformity with the contracts and respecting the Financial Regulations and other relevant rules in operations; timely treatment of all types of transactions.
- These activities will be monitored through targeted KPIs, such as budget execution and Time-To-Pay.

## Data protection

The FCH 2 JU applies Regulation (EU) 2018/1725 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies<sup>65</sup>.

The role of the Data Protection Officer (DPO) is exercised by the Legal Officer. The DPO together with all staff members involved in data processing activities, will continue to ensure an effective application of the data protection legal framework.

In 2022, the following actions will be taken:

- Monitor and update as needed the electronic central register of records of processing activities, published on the FCH 2 JU website;
- Implement and follow up the implementation of the mitigation measures decided in Data Protection Impact Assessments.
- Continued awareness raising for staff with regard to the data protection related tools, keeping an update records, as well as on the different aspects in implementing the data protection legislation through bi-annual sessions to be organised by the DPO;
- General and ad-hoc advice to the controller in fulfilling its obligations;

---

<sup>65</sup> OJ L 295, 21.11.2018, p. 39–98. Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC

- The DPO will continue to provide support for the preparation of any new records and corresponding privacy statements;
- Continue to participate in the data protection working groups of the EU institutions and bodies for maintaining up-to-date the necessary documentation relating to data protection in the framework of Horizon 2020 / Horizon Europe;
- Ensure follow-up with guidelines provided by the EDPS, the European Data Protection Board, CJEU decisions affecting the field of data protection in the context of FCH 2 JU's activities.

## 2.5 Governance

The **Governing Board (GB)** is the main decision-making body of the FCH 2 JU. It shall have overall responsibility for the strategic orientation and the operations of the FCH 2 JU and shall supervise the implementation of its activities in accordance with Article 7 of the Statutes. The GB is composed of 3 representatives of the European Commission on behalf of the EU, 6 representatives of the Industry Grouping (Hydrogen Europe) and 1 representative of the Research Grouping (Hydrogen Europe Research). The GB is planning to hold three meetings during 2022.

The indicative key decisions of the GB in the year 2022 are listed below:

<b>Key decisions in 2022 – timetable</b>	
Approve the Annual Activity Report (AAR) 2021 and adopt its assessment	Q2
Deliver an opinion on the Final Accounts 2021	Q2
Approve the independent assessment of the level of in-kind contributions (related to FP7) as at 31 December 2021	Q2
Adopt the Annual Work Plan and Budget for 2023 including the staff establishment plan	Q4

**The States Representatives Group (SRG)** is an advisory body to the GB. It consists of one representative of each Member State and of each country associated to the Horizon 2020 Framework Programme. The SRG shall be consulted and, in particular review information and provide opinions on the following matters: (a) programme progress in the FCH 2 JU and achievement of its targets; (b) updating of strategic orientation; (c) links to the Horizon 2020; (d) annual work plans; (e) involvement of SMEs. The GB shall inform without undue delay the SRG of the follow up it has given to recommendations or proposals provided by the SRG, including the reasoning if they are not followed up. The Chairperson of the SRG shall have the right to attend the meetings of the GB and take part of its deliberations but without voting rights. The SRG will hold at least two meetings in 2022.

**The Scientific Committee (SC)** is an advisory body to the GB and shall consist of no more than 9 members. The members shall reflect a balanced representation of worldwide-recognized expertise from academia, industry and regulatory bodies. The SC role is to provide (a) advice on scientific priorities to be addressed in the annual work plans; (b) advice on scientific achievements described in the Annual Activity Report. The Chairperson of the SC shall have the right to attend the meetings of the GB and take part of its deliberations, but without voting rights. During 2022, the SC activities may continue as regards point (b) of its mandate (as no further call for proposals are planned under the FCH 2 JU).

**The Stakeholder Forum (SF)** is an advisory body to the GB. It is an important communication channel to ensure transparency and openness of the FCH 2 JU programme. It provides an overview of the major developments in the past year and seeks to outline a vision for the way the sector will unfold in the coming years. It shall be convened once a year and shall be open to all public and private stakeholders, international interest groups from Member States, Associated Countries as well as from other countries. The SF shall be informed of the activities of the FCH 2 JU and shall be invited to provide comments. As of 2020, the Stakeholder Forum is enlarged to a European Hydrogen Forum (part of a Hydrogen Week<sup>66</sup>), to further include all EU activities on hydrogen and therefore, collaborate with

---

<sup>66</sup> <https://www.fch.europa.eu/european-hydrogen-week>

Hydrogen Alliance activities. Due to the current big attention and multiple activities on hydrogen at EU level, it will continue to be organised in 2022.

## 2.6 Internal Control framework

FCH 2 JU revised Internal Control Framework was adopted by the GB in August 2018 .

The priority objective remains to implement and maintain an effective internal control system so that reasonable assurance can be given that (1) resources assigned to the activities are used according to the principles of sound financial management and (2) the control procedures in place give the necessary guarantees concerning the legality and regularity of transactions.

For this purpose, particular emphasis will be given to the assessment of efficiency of internal control measures.

Following the assessment of the internal control systems carried out in 2021, the following actions were identified for 2022:

Regarding the component **of the risk assessment**:

- An antifraud awareness session will take place in 2022

Regarding the component **Control Activities**:

- Implement and follow up on implementation of the mitigation measures identified in the Data Protection Impact Assessments (DPIA)

Regarding the component **Information and Communication component**:

- Use of Qualified Electronic Signature in Ares to be implemented in 2022

## Financial procedures

The financial procedures guide FCH 2 JU operations and lay out how the JU uses and manages its funds and resources. The workflows in place follow the financial rules, the general framework applicable in the Commission and the H2020 rules and guidance.

For grant agreements, the reporting and validation of costs is done via the EC IT tools (SyGMa, COMPASS). Payments are executed via the ABAC IT tool (EC accounting system).

## Ex-ante and ex-post controls

**Ex-ante controls** are essential to prevent errors and avoid the need for ex-post corrective actions. In accordance with Article 74 of the Financial Regulation 2018/1046<sup>67</sup>, “each operation shall be subject at least to an ex ante control relating to the operational and financial aspects of the operation, on the basis of a multiannual control strategy which takes risk into account.”. Therefore, the main objective of ex ante controls is to ascertain that the principle of sound financial management has been applied.

An ex-ante control can take the form of checking grant agreements, initiating, checking and verifying invoices and cost claims, carrying out desk reviews (performed by FCH 2 JU project, finance and legal officers); mid-term reviews carried out by external experts and ad-hoc technical reviews (when deemed necessary).

FCH 2 JU has developed elaborated procedures defining the controls to be performed by project and finance officers for every cost claim, invoice, commitment and payment taking into account risk-based and cost-effectiveness considerations.

---

<sup>67</sup> OJ L193, 30.7.2018 p.66

In 2022, specific attention will be put to the following elements of ex-ante control:

- Targeted workshops and reviews for beneficiaries and projects with higher identified inherent risk, especially for smaller SMEs;
- Participation of the finance officers to audits launched by Common Audit Service (CAS) with the aim to identify potential risks as well as for training purposes;
- Application of the feedback from ex-post audits and lessons learnt on ex-ante controls, e.g.; identification and red-flags for most frequent H2020 errors identified by ex-post audits;
- Establishing a system to measure the impact of our ex-ante controls;
- Participation in establishing the Horizon Europe ex-ante control strategy including risk fiches related to anti-fraud.

**Ex-post controls** are defined as the controls executed to verify financial and operational aspects of finalised budgetary transactions in accordance with Article 19 of FCH 2 JU Financial Rules. The main objectives of the ex-post controls are to ensure that legality, regularity and sound financial management (economy, efficiency and effectiveness) have been respected and to provide the basis for corrective and recovery activities, if necessary. FCH 2 JU ex post controls of FCH grants include financial audits which are monitored by CAS (Unit H2) of the Common Implementation Centre (CIC), in close cooperation with the FCH 2 JU, except for implementation which remains fully with the FCH 2 JU. CAS may also outsource the audit work to external audit firms for the FCH-H2020 grants.

In 2022, focus will be put on the following:

- In cooperation with CAS, launching of new H2020 audits in two rounds: early in 2022 based on analytical risk-profile review of the main beneficiaries and later in 2022 based on the JUs' random sampling methodology to cover annual targets as per Annex 1 of the H2020 ex-post audit strategy;
- In cooperation with CAS, and in line with H2020 Working Arrangements, ensure monitoring of timely completion of the H2020 audits;
- Contribute, in cooperation with the CAS, to developments of the Horizon Europe programme, based on experience and lessons learnt from H2020;
- Building on the knowledge gained in H2020, to participate in establishing the Horizon Europe ex-post audit strategy.

### **Anti-fraud initiatives**

FCH 2 JU implements the common Research **Anti-Fraud Strategy**. In March 2019, CIC adopted the revised Research Family Anti-Fraud Strategy (RAFS 2019) and the associated action plan (replacing RAFS 2015 and its action plan). The implementation of the action plan is monitored through regular meetings of the Fraud and irregularity Committee (FAIR) to which the FCH 2 JU takes part. Furthermore for areas of expenditure other than grants, the FCH 2 JU applies 'mutatis mutandis' by analogy the anti-fraud strategy of DG R&I. This is relevant in particular for expert management, procurement and internal fraud and the risk analysis lead to the conclusion that the residual risks (after mitigating actions) are low.

In 2022, FCH 2 JU will:

- continue to apply harmonized preventive measures for fraud detection, e.g. via enhanced-monitoring tool available as a new feature in Sygma-Compass workflow;

- implement the anti-plagiarism check of project deliverables;
- participate to FAIR meetings organized by DG R&I;
- arrange an awareness raising session on fraud prevention and detection.

## **Audits**

Internal audits are carried out by the Internal **Audit Service of the European Commission (IAS)** in liaison with Internal Control and Audit Manager.

In 2022, focus will be put on the following:

- providing input and assistance to IAS in their new risk assessment in view of establishing a new strategic internal audit plan (SIAP);
- continue to implement action plans stemming from the last IAS audit in 2020 (from which all recommendations and action plans are to be closed by December 2021).

As regards **European Court of Auditors (ECA)** audits, in 2022 the FCH 2 JU will:

- Liaise with the independent auditor (contracted in 2020 based on the results of the reopening of competition under EC (DG BUDG) FWC) to audit FCH 2 JU accounts for 2021 as required by the FCH 2 JU Financial Rules);
- Follow up and implement any recommendation made in ECA reports on the FCH 2 JU annual accounts;
- Provide the necessary information and support for ECA audit on 2021 and 2022 accounts;
- Support the ECA team in their field or remote missions for FCH 2 JU projects selected (on a sample basis) for an ex-post financial reviews, including follow up with FCH 2 JU beneficiaries and with CAS.

## **3. BUDGET YEAR 2022**

### **3.1 Budget information**

The draft budget 2022 covers all administrative needs for 2022 as well as H2020 operational activities. 2022 budget is built under the assumption that the Council Regulation establishing Clean Hydrogen Joint Undertaking will enter into force within 2021. Therefore, the budget reflects the increased needs under the new Joint Undertaking.

It is noted that the budget of the JU shall be adapted to take into account the amount of the Union contribution as laid down in the budget of the Union.



The estimated revenue of the JU for the year 2022 include contributions to the administrative costs from Hydrogen Europe and Hydrogen Europe Research as well as the contribution of the Union for administrative costs and operational activities (the latter only for payment appropriations). Amounts are expressed in euros.

Title Chapter Article Item	Heading	Budget 2020 CA (executed)	Budget 2020 PA (executed)	Budget 2021 CA	Budget 2021 PA	Budget 2022 CA	Budget 2022 PA	Remarks
20	<b>SUBSIDIES AND REVENUES</b>							
2001	European Commission subsidy for operational expenditure (7th Framework Programme)	0	4,521,322		600,041	0	0	Council Regulation 559/2014 of 6 May 2014 on the establishment of the Fuel Cells and Hydrogen 2 Joint Undertaking
2002	European Commission subsidy for administrative expenditure	2,381,733	2,381,733	2,649,250	2,649,250	3,440,000	3,440,000	Council Regulation 559/2014 of 6 May 2014 on the establishment of the Fuel Cells and Hydrogen 2 Joint Undertaking includes EFTA (2.41% in 2020, 2.66% in 2021)
2003	Hydrogen Europe contribution for administrative expenditure	2,048,290	2,048,290	2,278,355	2,278,355	2,958,400	2,958,400	Council Regulation 559/2014 of 6 May 2014 on the establishment of the Fuel Cells and Hydrogen 2 Joint Undertaking
2004	Hydrogen Europe Research contribution for administrative expenditure	333,443	333,443	370,895	370,895	481,600	481,600	Council Regulation 559/2014 of 6 May 2014 on the establishment of the Fuel Cells and Hydrogen 2 Joint Undertaking
2005	European Commission subsidy for operational expenditure (Horizon 2020)	81,510,246	76,127,865		60,815,319	0	40,658,254	Council Regulation 559/2014 of 6 May 2014 on the establishment of the Fuel Cells and Hydrogen 2 Joint Undertaking includes EFTA (2.41% in 2020, 2.66% in 2021)
2006	JTI revenues	3,863,870	3,863,870					Interest, income from liquidated damages & others
	<b>Total title subsidies and revenues</b>	<b>90,137,582</b>	<b>89,276,523</b>	<b>5,298,500</b>	<b>66,713,860</b>	<b>6,880,000</b>	<b>47,538,254</b>	
30	<b>REACTIVATIONS</b>							
3016	C2 reactivation of appropriations for administrative expenditure (2019)	424,410	1,294,096	250,000	250,000			FCH 2 JU Financial rules article 6 - unused PA for administrative costs re-entered to be used for administrative activities
3017	C2 reactivation of appropriations for operational expenditure (2019)	12,784,309	300,000					FCH 2 JU Financial rules article 6 - unused CA for operational costs re-entered to be used for operational activities
3018	C2 reactivation of appropriations for administrative expenditure (2020)			43,500	964,403			FCH 2 JU Financial rules article 6 - unused PA for administrative costs re-entered to be used for administrative activities
3019	C2 reactivation of appropriations for operational expenditure (2020)			5,441,287	3,035,085			FCH 2 JU Financial rules article 6 - unused CA for operational costs re-entered to be used for operational activities
3020	C8 reactivation of appropriations			2,800,000				FCH 2 JU Financial rules article 6 - unused CA for operational costs re-

	operational expenditure (2021)								entered to be used for operational activities
3021	C2 reactivation of appropriations administrative expenditure (2021)								FCH 2 JU Financial rules article 6 - de-committed CA for administrative activities re-entered to be used for administrative activities
3022	C2 reactivation of appropriations for operational expenditure (2021)					1,474,819		5,647,049	FCH 2 JU Financial rules article 6 - unused CA for operational costs re-entered to be used for operational activities
Total title reactivations		13,208,720	1,594,096	8,534,787	4,249,488	1,474,819		5,647,049	
TOTAL REVENUES		103,346,302	90,870,619	13,833,287	70,963,348	8,354,819		53,185,304	

2022 budget amounts to a total of EUR 8 357 819 in CA and EUR 53 185 304 in PA.

Title Chapter Article Item	Heading	Executed 2020		Financial year 2021		Financial year 2022		Ratio 2020/2022		Comments
		Commitments	Payments	Commitment appropriations (CA)	Payment appropriations (PA)	CA	PA	CA	PA	
<b>1</b>	<b>STAFF EXPENDITURE</b>									
1 1	STAFF IN ACTIVE EMPLOYMENT	3,281,888	3,256,817	3,631,800	3,738,375	3,825,000	3,825,000	86%	85%	Salaries for temporary staff and contract agents, family allowances, expatriation and foreign residence allowances, unemployment insurance, insurance against accidents and occupational disease, annual travel costs Interim staff and trainees SNE allowances Installation allowance, daily subsistence, resettlement allowance and removal costs for staff arriving/departing Cost of PMO provisions
1 2	EXPENDITURE RELATED TO RECRUITMENT	576	576	10,400	10,400	5,000	5,000	12%	12%	Miscellaneous expenditure on staff recruitment (travel expenses)
1 3	MISSIONS AND TRAVEL	21,522	31,038	58,375	58,375	60,000	60,000	36%	52%	Mission expenses
1 4	SOCIOMEDICAL INFRASTRUCTURE AND TRAINING	22,710	25,219	43,000	45,996	44,000	44,000	52%	57%	Training, medical service and mobility costs
1 5	ENTERTAINMENT AND REPRESENTATION EXPENSES	4,532	3,481	5,000	6,050	4,000	4,000	113%	87%	Representation and receptions
<b>TOTAL TITLE 1</b>		<b>3,331,228</b>	<b>3,317,130</b>	<b>3,748,575</b>	<b>3,859,197</b>	<b>3,938,000</b>	<b>3,938,000</b>	<b>85%</b>	<b>84%</b>	
<b>2</b>	<b>BUILDING, EQUIPMENT AND MISCELLANEOUS EXPENDITURE</b>									
2 0	INVESTMENTS IN IMMOVABLE PROPERTY RENTAL OF BUILDINGS AND ASSOCIATED COSTS	345,462	341,859	356,000	362,050	855,000	855,000	40%	40%	Rent, works, insurance, common charges (water/gas/electricity), maintenance, security and surveillance
2 1	INFORMATION TECHNOLOGY	411,491	382,205	454,225	716,979	520,000	520,000	79%	74%	IT purchases, software licences, software development
2 2	MOVABLE PROPERTY AND ASSOCIATED COSTS	0	0	10,000	10,000	20,000	20,000	0%	0%	Purchases and rental of office equipment, maintenance and repair

2 3	CURRENT ADMINISTRATIVE EXPENDITURE	7,937	5,622	9,300	11,907	9,000	9,000	88%	62%	Office supplies, library, translation service, bank charges and miscellaneous office expenditure
2 4	CORRESPONDENCE, POSTAGE AND TELECOMMUNICATIONS	22,038	12,082	13,000	29,359	10,000	10,000	220%	121%	Telephones, video conferences and postal services
2 5	EXPENDITURE ON FORMAL AND OTHER MEETINGS	14,962	18,227	50,000	50,000	50,000	50,000	30%	36%	Official meetings such as SRG, Scientific Committee, Governing Board
2 6	COMMUNICATION COSTS	524,705	371,568	660,000	1,057,664	700,000	700,000	75%	53%	External communication and events
2 7	SERVICE CONTRACTS	148,087	209,952	167,000	287,572	647,000	647,000	23%	32%	Studies and audits
2 8	EXPERT CONTRACTS AND MEETINGS	246,927	252,867	123,900	128,175	131,000	131,000	188%	193%	Costs related to expert contracts (evaluations, mid-term, ad-hoc and final reviews)
<b>TOTAL TITLE 2</b>		<b>1,721,607</b>	<b>1,594,383</b>	<b>1,843,425</b>	<b>2,653,706</b>	<b>2,942,000</b>	<b>2,942,000</b>	<b>59%</b>	<b>54%</b>	
<b>TOTAL TITLE 1+2 (ADMINISTRATIVE EXPENDITURE)</b>		<b>5,052,835</b>	<b>4,911,513</b>	<b>5,592,000</b>	<b>6,512,903</b>	<b>6,880,000</b>	<b>6,880,000</b>	<b>73%</b>	<b>71%</b>	
<b>3</b>	<b>OPERATIONAL EXPENDITURE</b>									
3 0 0 1	Implementing the research agenda of FCH Joint Undertaking: 7th Framework Programme (FP7)	0	6,101,482	0	1,368,001	0	-	0%	203%	This appropriation shall cover the operational costs of the JU regarding FP7 grants (pre-financings, interim and final payments) and studies.
3 0 0 2	Implementing the research agenda of FCH Joint Undertaking: Horizon 2020	93,347,310	87,889,956	8,241,287	63,082,444	1,474,819	46,305,304	0%	190%	This appropriation shall cover the operational costs of the JU regarding H2020 grants (pre-financings, interim and final payments), studies and JRC contribution.
<b>TOTAL TITLE 3 (OPERATIONAL EXPENDITURE)</b>		<b>93,347,310</b>	<b>93,991,438</b>	<b>8,241,287</b>	<b>64,450,445</b>	<b>1,474,819</b>	<b>46,305,304</b>	<b>6329%</b>	<b>203%</b>	
<b>TOTAL EXPENDITURE</b>		<b>98,400,145</b>	<b>98,902,951</b>	<b>13,833,287</b>	<b>70,963,348</b>	<b>8,354,819</b>	<b>53,185,304</b>	<b>1178%</b>	<b>186%</b>	

## Revenues

As per article 13.2 of the Statutes annexed to the Council Regulation No 559/2014 of 06/05/2014, the Union shall contribute 50%, the Industry Grouping 43% and the Research Grouping 7% to the administrative budget.

The initial administrative budget for 2022 will be entirely financed by Members' contributions.

Operational expenses are entirely covered by the EC subsidy. For the initial 2022 budget, only H2020 appropriations are indicated. The commitment appropriations for H2020 come from unused appropriations of previous years that will be reactivated in the initial 2022 budget.

## Expenditure

Overall the administrative budget (Titles 1 and 2) will show an increase by 23% (EUR 1 288 000) compared to 2021.

In more details:

### Title 1 – Staff

Title 1 (staff costs) will represent 57% of the administrative costs in the 2022 budget. It mainly covers salaries (97% of the Title 1 amount) whereas other budget lines cover missions, training & socio-medical costs, recruitment costs and representation expenses.

Title 1 will show an increase by 5% (EUR 189 425) compared to 2021 costs. This is due to:

- An increase by 5% in budget line for staff in active employment. The budget will be increased since 2 additional staff persons will be recruited in 2022, in line with the Staff Establishment Plan. An indexation of 1.5% (applicable as of the second half of the year) is included in this provision. On the other side, interim contracts are estimated to be less (4) than in 2021 (9).
- Sociomedical infrastructure and training will increase by 2% (EUR 1 000) due to the increased medical costs estimated (pre-recruitment and annual medical tests) as well as the increased mobility costs
- Mission expenses will increase by 3% (EUR 1 625) compared to 2021 as more missions are foreseen for 2022 with the ease of travel restrictions. Nevertheless, missions will not reach at the level of pre-covid era.

On the other side, recruitment expenses will be lowered in 2022 but this is only because in 2021 the majority of costs came from the assessment centre. Next year's provision will cover for the new recruitments as per the Staff Establishment Plan.

### Title 2 – Infrastructure

Title 2 represents 43 % of the administrative costs in 2022. Title 2 will increase by 60% (EUR 1 101 575) compared to 2021. This is mainly due to a significant increase in service contracts as well as rentals and building charges. In more details:

- Service contracts will increase by 287% (EUR 480 000). The main reason for this increase is the provision of services in the field of communication and knowledge management with the aim to provide business continuity, and to support Mission Innovation. The provision for these services is EUR 425 000. In addition, a provision for audits in annual accounts is included in 2022 (EUR 55 000) compared to 2021. This assignment is contracted on a biannual basis.

- Rentals and building charges will be more than doubled compared to 2021 (increase by EUR 499,000) due to the office space refurbishment costs.
- IT costs will increase by 15% (EUR 65 775) as a result of an estimated upgrade of audiovisual equipment for the meeting rooms of the 1<sup>st</sup> floor, costs associated to office space refurbishments and Infosec new regulation costs.
- Communication costs will increase by 6% (EUR 40 000) on the assumption that European Hydrogen week in 2022 will be carried out with increased physical presence.
- Expert contracts and meetings will increase by 6% (EUR 7 100) as there will be a marginal increase of mid-term and final reviews foreseen for 2022 (42 instead of 36 in 2021).
- Movable property will double (an increase of EUR 20 000) as a result of anticipated office furniture purchases in the context of new office arrangements.

On the other side, telecommunication costs will decrease by EUR 3 000 as the effect of migrating fixed telephony to MS Teams Voice, being free of charge.

### **Title 3 – Operational**

2022 initial budget includes only H2020 commitment and payment appropriations for operations. In terms of commitment, the amount of EUR 1 474 819 comes from reactivations of unused appropriations and will cover:

- JRC plan for 2022 (estimated at EUR 775 000).
- The second specific contract under the framework contract for the Guarantees of Origin (EUR 488 000).
- The procurement for the work of European Hydrogen Safety Panel 2022 (EUR 211 819).

Concerning payment appropriations, there will be no FP7 payments in 2022. Regarding H2020 payments, they will be decreased by 29% (EUR 18 738 022) due to the fact that no pre-financing payment is anticipated in 2022 (as was the case in 2021 with 2 additional pre-financings). Also there will be more interim and less final payments than in 2021. Final payments are usually higher than interim. The H2020 payment appropriations will cover:

- 64 payments of reports (24 final and 40 interim).
- Payments for various procurement activities (estimated at EUR 2 000 000)
- Payments for JRC (balance of 2021 plan and pre-financing for 2022): EUR 872,500
- Payment for the expert contracts in European Hydrogen Safety Panel for 2021

### **Summary Statement of Schedule of Payments**

The FCH 2 JU Schedule of payments represents a summary statement of the schedule of payments due in subsequent financial years to meet budget commitments entered into earlier financial years (before 2021) as well as in 2021.

### SUMMARY SCHEDULE OF PAYMENTS (Operational)

2020 Outturn		2021 Budget		2022 Budget		Difference (2022/2021)	
Committed	Paid	CA	PA	CA	PA	CA	PA
93,347,310	93,991,438	8,241,287	64,450,445	1,474,819	46,198,027	-82%	-28%

### DETAILS OF PAYMENT SCHEDULE (Operational)

FP7

Commitments		Payments					Outstanding amount	Total
		2021	2022	2023	2024			
Commitments still outstanding (RAL)	<b>3,334,430</b>	39,331	0	2,999,997	0	295,102	<b>3,334,430</b>	
<b>TOTAL</b>	<b>3,334,430</b>	39,331	0	2,999,997	0	295,102	<b>3,334,430</b>	

H2020

Commitments		Payments					Outstanding amount	Total
		2021	2022	2023	2024			
Commitments still outstanding (RAL)	<b>143,778,619</b>	25,442,148	46,305,304	38,403,188	22,069,453	11,558,526	<b>143,778,619</b>	
<b>TOTAL</b>	<b>143,778,619</b>	25,442,148	46,305,304	38,403,188	22,069,453	11,558,526	<b>143,778,619</b>	

**State of play on 26/10/2021:** RAL refers to open commitments on 26/10 - payments for 2021 refer to foreseen payments from 26/10/2021 until the end of the year

**FP7:** RAL refers to FCH open commitments from 1 grant

**H2020 pre-2020** RAL refers to 99 grants for which final payment is not yet done (hence not de-committed yet), 6 open commitments from procurement activities, the remaining appropriations to cover for the procurement plan in AWP 2021 and the unused appropriations from previous years

## 3.2 Staff Establishment Plan

The JU team of statutory staff consists of 29 positions<sup>68</sup> (27 TA and 2 CA).

In addition, staff resources include 2 Seconded National Experts (SNE).

The 2022 Staff Establishment Plan is shown below:

Grade	2020 budget	2020 filled	2021 budget	2022 budget
AD 14	1	1	1	1
AD 13	-	-	-	-
AD 12	-	-	2	2
AD 11	2	2	-	-
AD 10	-	-	-	-
AD 9	4	4	5	5
AD 8	4	2	3	4
AD 7	1	1	2	2
AD 6	3	5	2	3
AD 5	-	-	-	-
<b>Total AD<sup>69</sup></b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>17</b>
AST 9	1	1	1	1
AST 8	1	1	1	1
AST 7	1	1	1	1
AST 6	1	0	1	1
AST 5	1	1	2	2
AST 4	4	5	3	3
AST 3	-	-	-	1
<b>Total AST<sup>70</sup></b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>10</b>
Function Group IV	1	1	1	1
Function Group III	1	1	1	1
Function Group II	1	1	1	N/A

<sup>68</sup> 2 new AD positions are foreseen for the new Clean Hydrogen partnership – as approved in May 2021 in the Draft budget 2022: Working document III, published on 8 June 2021 (ref. [https://ec.europa.eu/info/publications/working-documents-2022\\_en](https://ec.europa.eu/info/publications/working-documents-2022_en))

<sup>69</sup> AD stands for Administrator

<sup>70</sup> AST stands for Assistant

<b>Grade</b>	<b>2020 budget</b>	<b>2020 filled</b>	<b>2021 budget</b>	<b>2022 budget</b>
<b>Total Contract Agents</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>Total Seconded National Experts</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>



## 4. LIST OF ACRONYMS

Term	Definition
<b>AAR</b>	Annual Activity Report
<b>AWP</b>	Annual Work Plan
<b>CA</b>	Contract Agent (HR); Commitment Appropriations (Budget)
<b>CAS</b>	Common Audit Service
<b>CEF</b>	Connecting Europe Facility funding instrument
<b>CIC</b>	Common Implementation Centre (former CSC)
<b>COP</b>	Conference of the Parties (yearly conferences in the framework of the United Nations Framework Convention on Climate Change)
<b>CORDIS</b>	Community Research and Development Information Service
<b>CRIG</b>	Communication Research and Innovation Group
<b>CTCN</b>	Climate Technology Centre & Network
<b>DG BUDG</b>	Directorate-General for Budget
<b>DG GROW</b>	Directorate-General for Internal Market
<b>DG HR</b>	Directorate-General for Human Resources and Security
<b>DG MOVE</b>	Directorate-General for Mobility and Transport
<b>DG RTD; DG R&amp;I</b>	Directorate-General for Research and Innovation
<b>DIGIT</b>	Directorate-General for Informatics
<b>DPO</b>	Data Protection Officer
<b>ED</b>	Executive Director
<b>EC</b>	European Commission
<b>ECA</b>	European Court of Auditors
<b>EHSP</b>	European Hydrogen Safety Panel
<b>EMM</b>	European Media Monitoring
<b>EFTA</b>	European Free Trade Area
<b>EU</b>	European Union
<b>EUSEW</b>	EU Sustainable Energy Week
<b>FAIR</b>	Fraud And Irregularity Committee of DG RTD
<b>FCH 2 JU</b>	The Fuel Cells and Hydrogen 2 Joint Undertaking: name used to refer to the legal entity established as the public & private partnership.
<b>FP7</b>	EU's Seventh Framework Programme for Research and Technological Development (2007 - 2013)
<b>GB</b>	Governing Board
<b>H2020</b>	Horizon 2020 – EU's Framework Programme for Research and Innovation programme (2014 - 2020)

<b>HE</b>	Hydrogen Europe
<b>HELLEN</b>	Hydrogen Events and Lessons LEarNed database
<b>HER</b>	Hydrogen Europe Research
<b>HIAD</b>	Hydrogen Incident and Accident Database
<b>HRS</b>	Hydrogen Refuelling Station
<b>HTE</b>	High Temperature Electrolysis
<b>IAS</b>	Internal Audit Service
<b>IEA</b>	International Energy Agency
<b>IEC</b>	International Electrotechnical Commission
<b>IPHE</b>	International Partnership for Hydrogen into the Economy
<b>ISO</b>	International Standards Organization
<b>JRC</b>	Joint Research Centre of the European Commission
<b>KPI</b>	Key Performance Indicator
<b>LCA</b>	Life-Cycle Assessment
<b>LTWE</b>	Low Temperature Water Electrolysis
<b>MAWP</b>	Multi-Annual Work Plan
<b>MW</b>	Megawatt
<b>NECPs</b>	National Energy and Climate Plans
<b>NG</b>	Natural Gas
<b>NGO</b>	Non-governmental organisation
<b>PEM</b>	Proton Exchange Membrane Fuel Cell
<b>PA</b>	Payment Appropriations
<b>PO</b>	FCH 2 JU Programme Office
<b>PPP</b>	Public Private Partnership
<b>PRD</b>	Programme Review Days
<b>PNR</b>	Pre-normative Research
<b>RCS</b>	Regulations, Codes and Standards
<b>RFNBO</b>	Renewable Fuels of Non- Biological Origins
<b>R&amp;D; R&amp;I</b>	Research and Development; Research and Innovation
<b>SET-plan</b>	Strategic Energy Technology plan
<b>SME</b>	Small and Medium Enterprises
<b>SoA</b>	State of the Art
<b>SOC</b>	Solid Oxide (Fuel) Cell
<b>SRG</b>	States Representative Group, advisory body of the FCH 2 JU gathering representatives from Member States and Associated Countries
<b>TA</b>	Temporary Agent

<b>TRL</b>	Technology Readiness Level
<b>TRUST</b>	Technology Reporting Using Structured Templates (Data collection platform)
<b>UN</b>	United Nations

## 5. Annex: Horizon 2020 Indicators for Joint Undertakings

- Table I shows the Horizon 2020 KPIs which apply to JUs, both under Industrial Leadership and Societal Challenges (Horizon 2020 Key Performance Indicators (Annex II - Council Decision 2013/743/EU)).
- Table II presents all indicators for monitoring of cross-cutting issues which apply to JUs (Annex III - Council Decision 2013/743/EU).
- In tables I and II, the numbers attributed to the indicators correspond with those in the Horizon 2020 indicators approved by the RTD Director-General and agreed by all the Research family DGs (according to Annexes II and III - Council Decision 2013/743/EU). The missing numbers correspond to KPIs not applicable to the JUs.
- KPIs and Indicators that correspond to those approved by the RTD Director-General are presented with a white background in the tables. They are aligned to what has been discussed between the Common Support Centre and the JUs. KPIs and monitoring indicators in tables I and II, which do not correspond to those approved by the RTD Director-General, are presented with a green background in the tables.
- Table III presents the KPI specific for FCH 2 JU.

**TABLE I: Horizon 2020 Key Performance Indicators<sup>71</sup> common to all JUs**

		Key Performance Indicator	Definition/Responding to Question	Type of Data Required	Data to be Provided by	Baseline at the Start of Horizon 2020 (latest available)	Target at the End of Horizon 2020	Automated
INDUSTRIAL LEADERSHIP	12	SME - Share of participating SMEs introducing innovations new to the company or the market (covering the period of the project plus three years);	Based on Community Innovation Survey (?). Number and % of participating SMEs that have introduced innovations to the company or to the market;	Number of SMEs that have introduced innovations;	HORIZON 2020 beneficiaries through project reporting	n.a. [ <u>new approach</u> under Horizon 2020]	50%	Yes
	13	SME - Growth and job creation in participating SMEs	Turnover of company, number of employees	Turnover of company, number of employees;	Horizon 2020 beneficiaries through project reporting	n.a. [ <u>new approach</u> under Horizon 2020]	To be developed based on FP7 ex-post evaluation and /or first Horizon 2020 project results	Yes
SOCIETAL CHALLENGES	14	Publications in peer-reviewed high impact journals	The percentage of papers published in the top 10% impact ranked journals by subject category.	Publications from relevant funded projects (DOI: Digital Object Identifiers); Journal impact benchmark (ranking) data to be collected by commercially available bibliometric databases.	Horizon 2020 beneficiaries through project reporting; Responsible Directorate/Service (via access to appropriate bibliometric databases)	n.a. [ <u>new approach</u> under Horizon 2020]	[ <u>On average, 20 publications per €10 million funding (for all societal challenges)</u> ]	Yes

<sup>71</sup> (based on Annex II to Council Decision 2013/743/EU)

		Key Performance Indicator	Definition/Responding to Question	Type of Data Required	Data to be Provided by	Baseline at the Start of Horizon 2020 (latest available)	Target at the End of Horizon 2020	Automated
	15	Patent applications and patents awarded in the area of the JTI	Number of patent applications by theme; Number of awarded patents by theme	Patent application number	Horizon 2020 beneficiaries through project reporting; Responsible Directorate/Service (via worldwide search engines such as ESPACENET, WOPI)	n.a. [ <u>new approach</u> under Horizon 2020]	On average, 2 per €10 million funding (2014 - 2020) RTD A6	Yes
	16	Number of prototypes testing activities and clinical trials <sup>72</sup>	Number of prototypes, testing (feasibility/demo) activities, clinical trials	Reports on prototypes, and testing activities, clinical trials	Horizon 2020 beneficiaries through project reporting	n.a. [ <u>new approach</u> under Horizon 2020]	[ <u>To be developed on the basis of first Horizon 2020 results</u> ]	Yes
	17	Number of joint public-private publications in projects	Number and share of joint public-private publications out of all relevant publications.	Properly flagged publications data (DOI) from relevant funded projects	Horizon 2020 beneficiaries through project reporting; Responsible Directorate/Service (via DOI and manual data input-flags)	n.a. [ <u>new approach</u> under H202]	[ <u>To be developed on the basis of first Horizon 2020 results</u> ]	Yes
	18*	New products, processes, and methods launched into the market	Number of projects with new innovative products, processes, and methods,	Project count and drop down list allowing to choose the type processes, products, methods,	Horizon 2020 beneficiaries through project reporting	n.a. [ <u>new approach</u> under Horizon 2020]	[ <u>To be developed on the basis of first Horizon 2020 results</u> ]	Yes

<sup>72</sup> Clinical trials are IMI specific

		Key Performance Indicator	Definition/Responding to Question	Type of Data Required	Data to be Provided by	Baseline at the Start of Horizon 2020 (latest available)	Target at the End of Horizon 2020	Automated
EVALUATION	NA	Time to inform (TTI) <u>all applicants</u> of the outcome of the evaluation of their application from the final date for submission of completed proposals	To provide applicants with high quality and timely evaluation results and feedback after each evaluation step by implementing and monitoring a high scientific level peer reviewed process	Number and % of information letters sent to applicants within target Average TTI (calendar days) Maximum TTI (calendar days)	Joint Undertaking	FP7 latest know results?	153 calendar days	Yes
	NA	Redress after evaluations	To provide applicants with high quality and timely evaluation results and feedback after each evaluation step by implementing and monitoring a high scientific level peer reviewed process	Number of redresses requested	Joint Undertaking	FP7 latest know results?		
GRANTS	NA	Time to grant (TTG) measured (average) from call deadline to signature of grants	To minimise the duration of the granting process aiming at ensuring a prompt implementation of the Grant Agreements through a simple and transparent grant preparation process	Number and % of grants signed within target Average TTG in calendar days Maximum TTG in calendar days	Joint Undertaking	n.a. [new approach under Horizon 2020]	TTG < 243 days ( as %of GAs signed)	Yes
	NA	Time to sign (TTS) grant agreements from the date of informing successful applicants (information letters)		Number and % of grants signed within target Average TTG in calendar days Maximum TTG in calendar days	Joint Undertaking	n.a. [new approach under Horizon 2020]	TTS 92 calendar days	Yes

		<b>Key Performance Indicator</b>	<b>Definition/Responding to Question</b>	<b>Type of Data Required</b>	<b>Data to be Provided by</b>	<b>Baseline at the Start of Horizon 2020 (latest available)</b>	<b>Target at the End of Horizon 2020</b>	<b>Automated</b>
<b>PAYMENTS</b>	NA	Time to pay (TTP) (% made on time) -pre-financing - interim payment -final payment	To optimize the payments circuits, both operational and administrative, including payments to experts	Average number of days for Grants pre-financing, interim payments and final payments;  Average number of days for administrative payments;  Number of experts appointed	Joint Undertaking	FP7 latest know results?	-pre-financing (30 days)  - interim payment (90 days)  -final payment ((90days)	Yes
<b>HR</b>	NA	Vacancy rate (%)		% of post filled in, composition of the JU staff <sup>73</sup>	Joint Undertaking	n.a. [new approach under Horizon 2020]		
<b>JU EFFICIENCY</b>	NA	Budget implementation/execution: 1. % CA to total budget 2. % PA to total budget	Realistic yearly budget proposal, possibility to monitor and report on its execution, both in commitment (CA) and payments (PA), in line with sound financial management principle	% of CA and PA	Joint Undertaking		100% in CA and PA	Yes
	NA	Administrative Budget: Number and % of total of late payments	Realistic yearly budget proposal, possibility to monitor and report on its execution in line with sound financial management principle	Number of delayed payments  % of delayed payments (of the total)	Joint Undertaking			Yes

<sup>73</sup> Additional indicators can be proposed/discussed with R.1 and/or DG HR



**NOTES:**

18\* This indicator is not a legally compulsory one, but it covers several additional specific indicators requested for more societal challenges by the services in charge.

**TABLE II: Indicators for monitoring Horizon 2020 Cross-Cutting Issues<sup>74</sup> common to all JUs**

	Cross-cutting issue	Definition/Responding to Question	Type of Data Required	Data to be Provided by	Data to be Provided in/to	Direct Contribution to ERA	Automated
2	Widening the participation	2.1 Total number of participations by EU-28 Member State	Nationality of Horizon 2020 applicants & beneficiaries (number of )	Horizon 2020 applicants & beneficiaries at the submission and grant agreement signature stage	JU AAR RTD Monitoring Report	YES	Yes
		2.2 Total amount of EU financial contribution by EU-28 Member State (EUR millions)	Nationality of Horizon 2020 beneficiaries and corresponding EU financial contribution	Horizon 2020 beneficiaries at grant agreement signature stage	JU AAR RTD Monitoring Report	YES	Yes
NA		Total number of participations by Associated Countries	Nationality of Horizon 2020 applicants & beneficiaries (number of )	Horizon 2020 applicants & beneficiaries at the submission and grant agreement signature stage	JU AAR RTD Monitoring Report	YES	Yes
NA		Total amount of EU financial contribution by Associated Country (EUR millions)	Nationality of Horizon 2020 beneficiaries and corresponding EU financial contribution	Horizon 2020 beneficiaries at grant agreement signature stage	JU AAR RTD Monitoring Report	YES	Yes
3	SMEs participation	3.1 Share of EU financial contribution going to SMEs (Enabling & industrial tech and Part III of Horizon 2020)	Number of Horizon 2020 beneficiaries flagged as SME;  % of EU contribution going to beneficiaries flagged as SME	Horizon 2020 beneficiaries at grant agreement signature stage	JU AAR RTD Monitoring Report		Yes

<sup>74</sup> (based on Annex III to Council Decision 2013/743/EU)

	Cross-cutting issue	Definition/Responding to Question	Type of Data Required	Data to be Provided by	Data to be Provided in/to	Direct Contribution to ERA	Automated
6	Gender	6.1 Percentage of women participants in Horizon 2020 projects	Gender of participants in Horizon 2020 projects	Horizon 2020 Beneficiaries through project reporting	JU AAR	YES	Yes
		6.2 Percentage of women project coordinators in Horizon 2020	Gender of MSC fellows, ERC principle investigators and scientific coordinators in other Horizon 2020 activities	Horizon 2020 beneficiaries at the grant agreement signature stage	JU AAR	YES	Yes
		6.3 Percentage of women in EC advisory groups, expert groups, evaluation panels, individual experts, etc.	Gender of memberships in advisory groups, panels, etc.	Compiled by Responsible Directorate/Service/Joint Undertaking based on existing administrative data made available by the CSC	JU AAR	YES	
7	International cooperation	7.1 Share of third-country participants in Horizon 2020	Nationality of Horizon 2020 beneficiaries	Horizon 2020 beneficiaries at the grant agreement signature stage	JU AAR RTD Monitoring Report	YES	Yes
		7.2 Percentage of EU financial contribution attributed to third country participants	Nationality of Horizon 2020 beneficiaries and corresponding EU financial contribution	Horizon 2020 beneficiaries at the grant agreement signature stage	JU AAR RTD Monitoring Report	YES	Yes
9	Bridging from discovery to market <sup>75</sup>	9.1 Share of projects and EU financial contribution allocated to Innovation Actions (IAs)	Number of IA proposals and projects properly flagged in the WP; follow up at grant level.	Project Office – at GA signature stage he/she will be required to flag on SYGMA. Responsible Directorate/Service (WP coordinator)/Joint Undertaking - via tool CCM2	JU AAR RTD Monitoring Report		Yes

<sup>75</sup> This indicator (9.2) is initially intended to monitor the Digital Agenda (its applicability could be only partial)

	Cross-cutting issue	Definition/Responding to Question	Type of Data Required	Data to be Provided by	Data to be Provided in/to	Direct Contribution to ERA	Automated
		9.2 Within the innovation actions, share of EU financial contribution focussed on demonstration and first-of-a-kind activities	Topics properly flagged in the WP; follow-up at grant level	Responsible Directorate/Service (WP coordinator)/Joint Undertaking - via tool CCM2	JU AAR RTD Monitoring Report		Yes
	NA	Scale of impact of projects (High Technology Readiness Level)	Number of projects addressing TRL <sup>76</sup> between...(4-6, 5-7)?	Joint Undertaking	JU AAR RTD Monitoring Report		
11	Private sector participation	11.1 Percentage of Horizon 2020 beneficiaries from the private for profit sector	Number of and % of the total Horizon 2020 beneficiaries classified by type of activity and legal status	Horizon 2020 beneficiaries at grant agreement signature stage	JU AAR RTD Monitoring Report		Yes
		11.2 Share of EU financial contribution going to private for profit entities (Enabling & industrial tech and Part III of Horizon 2020)	Horizon 2020 beneficiaries classified by type of activity; corresponding EU contribution	Horizon 2020 beneficiaries at grant agreement signature stage	JU AAR RTD Monitoring Report		Yes
12	Funding for PPPs	12.1 EU financial contribution for PPP (Art 187)	EU contribution to PPP (Art 187)	Responsible Directorate/Service/	JU AAR		Yes
		12.2 PPPs leverage: total amount of funds leveraged through Art. 187 initiatives, including additional activities, divided by the EU contribution	Total funding made by private actors involved in PPPs - in-kind contribution already committed by private members in project selected for funding	Joint Undertaking Services	JU AAR RTD Monitoring Report		

<sup>76</sup> TRL: Technology Readiness Level

	Cross-cutting issue	Definition/Responding to Question	Type of Data Required	Data to be Provided by	Data to be Provided in/to	Direct Contribution to ERA	Automated
			- additional activities (i.e. research expenditures/investment of industry in the sector, compared to previous year)		JU annual accounts (part of)		
13	Communication and dissemination	13.3 Dissemination and outreach activities other than peer-reviewed publications - [Conferences, workshops, press releases, publications, flyers, exhibitions, trainings, social media, web-sites, communication campaigns (e.g. radio, TV)]	A drop down list allows to choose the type of dissemination activity. Number of events, funding amount and number of persons reached thanks to the dissemination activities	Horizon 2020 Beneficiaries through project reporting	JU AAR RTD Monitoring Report	YES	Yes
14	Participation patterns of independent experts	14.2 Proposal evaluators by country	Nationality of proposal evaluators	Responsible Directorate/Service/Joint Undertaking in charge with the management of proposal evaluation	JU AAR		
		14.3 Proposal evaluators by organisations' type of activity	Type of activity of evaluators' organisations	Responsible Directorate/Service/Joint Undertaking in charge with the management of proposal evaluation	JU AAR	YES	
NA	Participation of RTOs and Universities	Participation of RTO <sup>77</sup> s and Universities in PPPs (Art 187 initiatives)	Number of participations of RTOs to funded projects and % of the total Number of participations of Universities to funded projects and % of the total % of budget allocated to RTOs and to Universities	Horizon 2020 beneficiaries at the grant agreement signature stage	JU AAR RTD Monitoring Report	YES	Yes

<sup>77</sup> RTO: Research and Technology Organisation

	Cross-cutting issue	Definition/Responding to Question	Type of Data Required	Data to be Provided by	Data to be Provided in/to	Direct Contribution to ERA	Automated
NA	Ethics	The objective is ensuring that research projects funded are compliant with provisions on ethics efficiently	% of proposals not granted because non-compliance with ethical rules/proposals invited to grant (target 0%); time to ethics clearance (target 45 days) <sup>78</sup>	Responsible Directorate/Service/Joint Undertaking	JU AAR RTD Monitoring Report		
NA	Audit	Error rate	% of common representative error; % residual error	CAS	JU AAR RTD Monitoring Report		Yes
NA		Implementation of ex-post audit results	Number of cases implemented; in total €million; % of cases implemented/total cases	CAS	JU AAR RTD Monitoring Report		Yes

**Notes:**

\* Horizon 2020 applicants - all those who submitted Horizon 2020 proposals

\* Horizon 2020 beneficiaries - all those who have signed a Horizon 2020 Grant Agreement

\*Responsible Directorate - DG RTD Directorates and R&I DGs family in charge with management of Horizon 2020 activities

\*Services -Executive Agencies and other external bodies in charge with Horizon 2020 activities

\*Project officer - is in charge of managing Horizon 2020 projects in Responsible Directorate/Service including Executive Agencies

---

<sup>78</sup> Data relates to pre-granting ethics review. This time span runs in parallel to granting process.

**TABLE III: Key Performance Indicators specific to FCH 2 JU**

Key Performance Indicator	Objective	Data to be Provided by	Baseline at the Start of Horizon 2020	Target at the End of Horizon 2020	Automated
Share of the fund allocated to the following research activities: - renewable energy - end user energy-efficiency - smart grids - storage		JU	Result of FP7		
Demonstrator projects hosted in MSs and regions benefiting from EU structural funds		JU	Result of FP7		