Fuel Cells and Hydrogen 2 Joint Undertaking

2014 Call for Proposals

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September 2014

New Energy World JU
fuel cells & hydrogen for sustainability

Joint Undertaking - Key Features: Strong Partnership with Focused Objective

The **European Union** represented by the European Commission

European **Industry Grouping** for the Fuel Cells and Hydrogen Joint Technology Initiative (NEW-IG)

New European **Research Grouping** on Fuel Cells and Hydrogen (N.ERGHY)

To accelerate the development of technology to establish the technology base for commercialisation

Adoption procedure of FCH 2 JU under Horizon 2020

European Commission:

- Proposal for a Regulation: 10 July 2013

European Parliament:
(Committee of Regions & Economic and Social Committee**):**

- ITRE Committee: 23 January 2014
- EP Plenary vote: 15 April 2014

Council of the European Union:

- Adoption: 6 May 2014

Official Journal

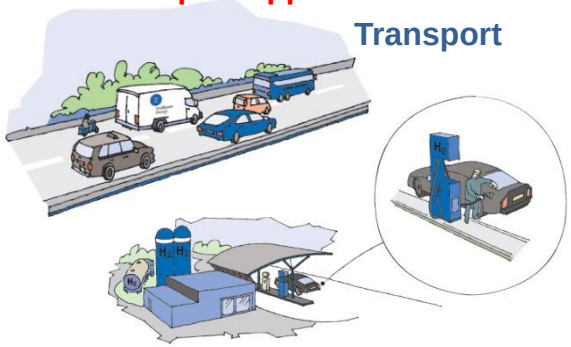
- Publication: 7 June 2014 (No 559/2014)
- Entering into force (20 days after publ.): 27 June 2014

FCH 2 JU objectives

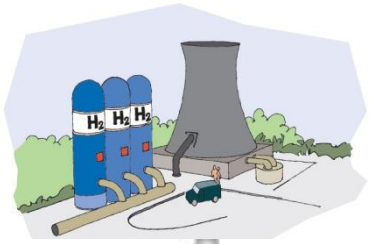
Reduction of production costs of long lifetime FC systems to be used in transport applications

Increase of the electrical efficiency and durability of low cost FCs used for power production

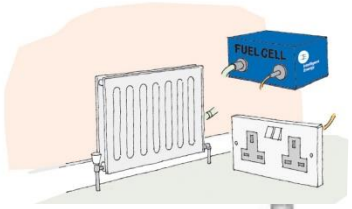
Transport



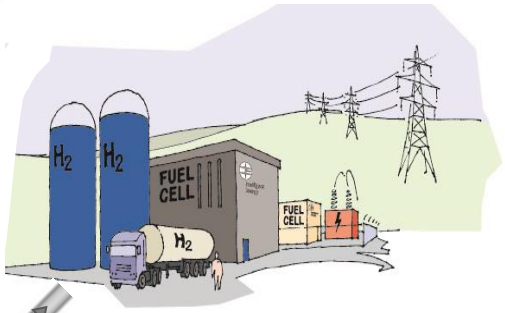
Industrial applications



Residential CHP



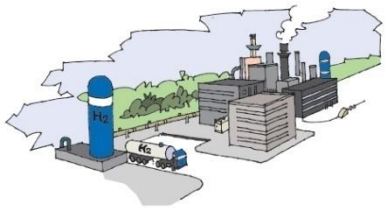
Feed to electricity grid



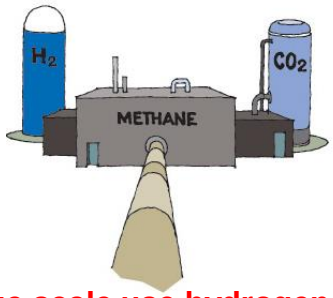
Reduce the use of critical raw materials

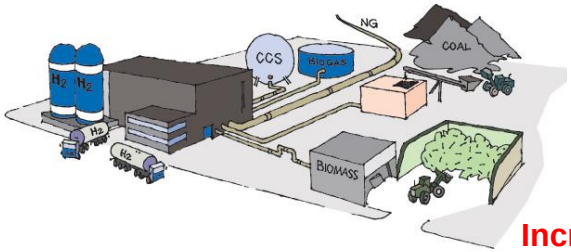
Existing natural gas, electricity and transport infrastructures

By-product from Chemical Industry



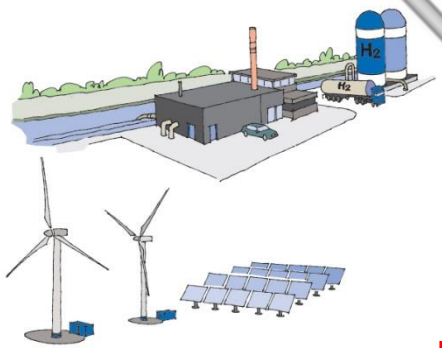
Methanisation feed to natural gas grid





Natural gas, biogas, coal, biomass

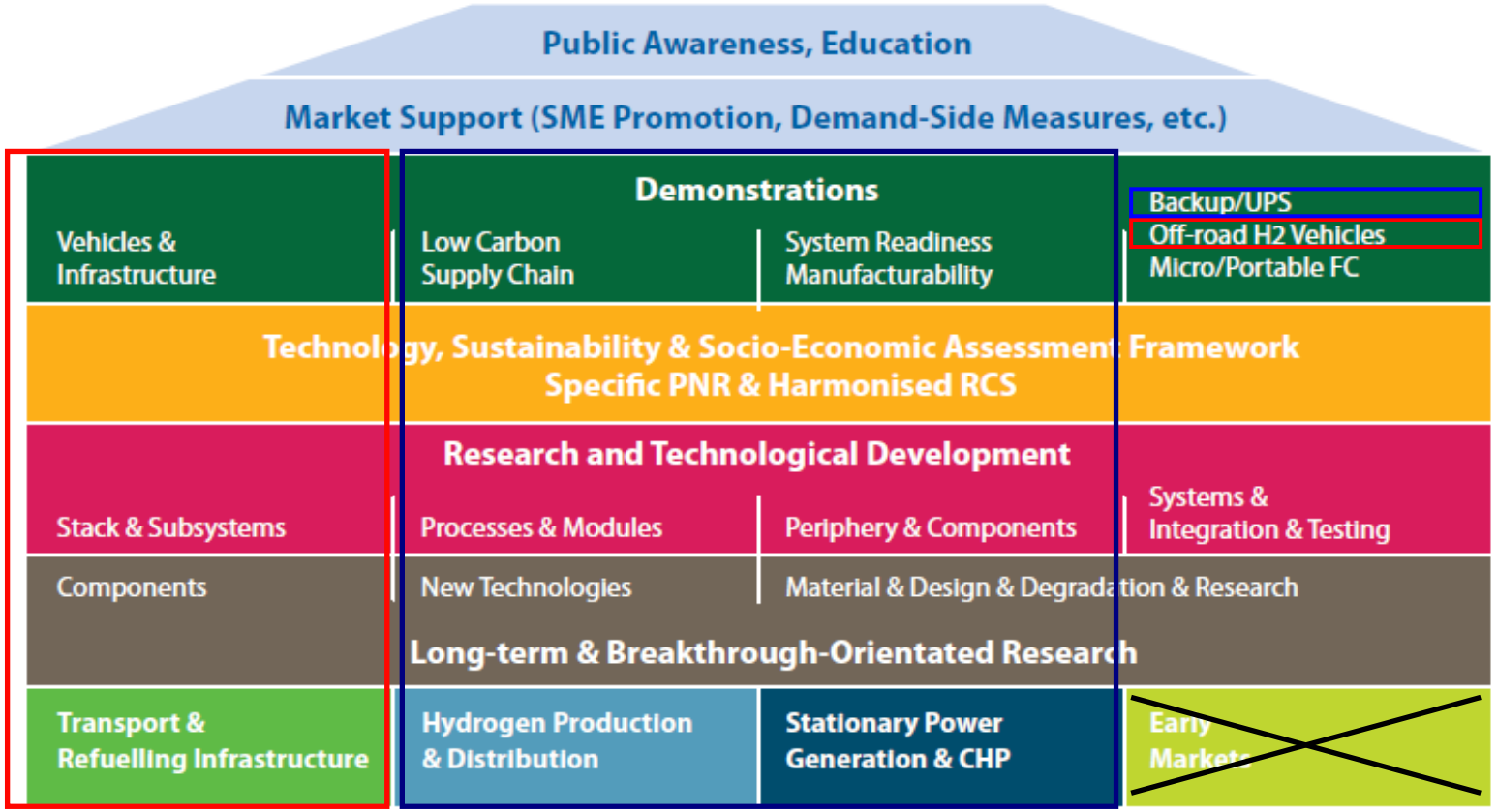
Increase the energy efficiency of low cost production of hydrogen from water electrolysis and renewable sources



Renewable generation, storage and 'buffering'

Large scale use hydrogen to support integration of renewable energy sources into the energy systems

Activity areas Vs Pillars



2 Pillars (Transport & Energy)

+

Cross-cutting

+

Overarching projects

Transport pillar

- Technologies for Transportation Systems
  - Road Vehicles
    - Car & Bus demonstration projects
    - Improvement of fuel cell
    - APUs for trucks or recreational vehicles
    - Two wheelers under discussion
  - Non-road mobile vehicles and machinery
    - Deployment of Forklifts and material handling vehicles
  - Refueling infrastructure
  - Maritime, rail and aviation application
    - APUs for different applications and propulsion for boats

Energy pillar

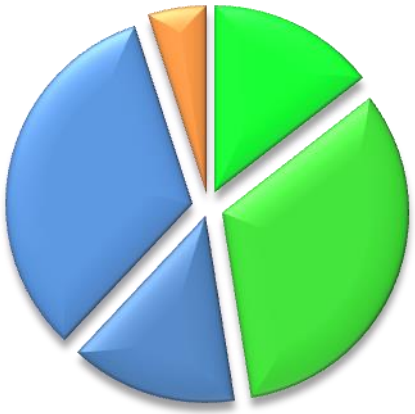
- Technologies for Energy Systems
  - Hydrogen production from renewable electricity
    - Large green hydrogen production systems compatible for (smart) grid integration
    - Large scale hydrogen storage and injection of hydrogen in the natural gas grid
    - Re-electrification
  - Hydrogen production with low carbon footprint from other resources and waste hydrogen recovery
  - Fuel cell systems for combined heat and/or power on industrial, local, domestic scales and small applications
  - Hydrogen storage, handling and distribution

Other

- Overarching Projects
- Cross-cutting research activities
  - Social acceptance and public awareness
  - Education and training
  - Safety
  - Pre-Normative Research
  - Building databases for environmental, economical, socio-economic subjects
  - Identification and development of financial mechanisms to support market introduction
  - Support portable applications & other niche market fuel cell solutions
  - socio-economic research to determine environmental and societal impact
  - Recycling of FCH technologies
  - Other supporting activities

Budget distribution

Funding distribution	Research and Innovation		Innovation		Total	
Transports Systems	94 (±5)	14.5%	213 (±10)	33%	307	47.5%
Energy Systems	94 (±5)	14.5%	213 (±10)	33%	307	47.5%
Cross-cutting activities					32	5%
Total	192	29%	426	66%	646	100%



Multi-Annual Work Programme 2014-2020

- Transports Systems R&I
- Transports Systems I
- Energy Systems R&I
- Energy Systems I
- Cross-cutting activities

Annual Work Programme 2014

- Launch: 9 July 2014
- Information Day: 10 July 2014, Auditorium Madou (Brussels)
- Registration via web-site
- Deadline: **6 November 2014** – Evaluation December 2014 (Experts?)
- Indicative budget: 93M€

Pillar	Action Type	# Topics	Indicative budget (M€)
Transport	5 RIA + 1 IA	6	10
	IA	1	32
Energy	RIA	8	16
	IA	3	25.5
Overarching	IA	1	5
Cross-cutting	2 CSA + 1 RIA	3	4.5
Totals		22	93

Types of Actions

Research and Innovation Actions, RIA – NO RfP definition but description in the WP annexes

actions with Research and Development activities at the core of the project intending to establish new scientific and technical knowledge and/or explore the feasibility of a new or improved technology, product, process, service or solution

- may include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment

- may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment

•up to *100% funding rate*

"Pure" Innovation Actions, IA – RfP definition

"Innovation action' means an action primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication"

•up to 70% funding rate (100% for non-profit legal entities)

Overlaps

'prototyping', 'testing', 'demonstrating' and 'piloting' *not necessarily specific to innovation activities; they could be used to describe research and development activities (100% funding);*

•*In the case of a **Research and Innovation action**, these activities are undertaken on a small scale prototype, in a laboratory or simulated environment*

•***Innovation projects** may include limited research and development activities.*

Type of project expected, funding and Technology Readiness Level scale indicated in the WP topics

Types of Actions *cont.*

Coordination and Support Action

Actions consisting primarily of accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure and may also include complementary activities of strategic planning, networking and coordination between programmes in different countries.

•up to 100% funding rate

Specific types of action - *rules should be exhaustively set in the Work Plan*

Programme co-fund: *an action funded through a grant, the main purpose of which is supplementing individual calls or programmes funded by entities, other than Union bodies, managing research and innovation programmes; may also include complementary activities of networking and coordination between programmes in different countries* ***(ERA-NET, European Joint Programme actions).***

Inducement and recognition prizes:

Three main aims:
- *Stimulate groundbreaking technologies*
- *Mobilize private research and innovation investments*
- *Generate public enthusiasm for new technologies*

Subject to contests:
- *Directly foreseen in the Work Programme*
- *Organized by a beneficiary of a CSA*

Technology readiness levels (TRL)

According to MAWP: mainly above TRL=3 (basic research under other EU programmes)

TRL 1 – basic principles observed

TRL 2 – technology concept formulated

TRL 3 – experimental proof of concept

TRL 4 – technology validated in lab

TRL 5 – technology validated in relevant environment *(industrially relevant environment in the case of key enabling technologies)*

TRL 6 – technology demonstrated in relevant environment *(industrially relevant environment in the case of key enabling technologies)*

TRL 7 – system prototype demonstration in operational environment

TRL 8 – system complete and qualified

TRL 9 – actual system proven in operational environment *(competitive manufacturing in the case of key enabling technologies; or in space)*

Transport pillar
FCH-02 2014

Topic	Type of Action	Ind. Budget MEURO
1.1: Standardization of components for cost-efficient fuel cell systems for transportation applications	Innovation (IA)	10
1.2: Cell and stack components, stack and system manufacturing technologies and quality assurance	Research & Innovation (RIA)	
1.3: Development of advanced fuel cell systems and system components		
1.4: Hydrogen storage standardisation and components optimization for mass production		
1.5: Development of cost effective and reliable hydrogen refuelling station technologies and systems for fuel cell vehicles		
1.6: Engineering studies for large scale bus refuelling		
1.7: Large scale demonstration of refuelling infrastructure for road vehicles	Innovation (IA)	32

Transport pillar IA

Topic 1.1: Standardization of components for cost-efficient fuel cell systems for transportation applications

Challenge

- Standardization of interfaces and components to reduce cost to accelerate market introduction of automotive fuel cell technology

Scope

- Identify and select components or subsystems
- Align specifications and interfaces
- Define test protocols
- Transfer to industry codes & standards and regulations

Impact

- Standardization of Balance-of-Plant components will lead to cost reduction and likely, commercialisation.

Other information

- *One project maximum. 3-4 years. Indicative budget of 2-3 million €*

Transport pillar RIA

Topic 1.2: Cell and stack components, stack and system manufacturing technologies and quality assurance

Challenge

- Improve manufacturability, production efficiency and production cost of automotive fuel cell stacks

Scope

- Improvements to existing, validated designs for cells
- Improvements in cell and stack manufacturing, assembly and QA methods
- Simplification of design and manufacturing methods of cell components, cells, stacks and/or stack modules
- Testing and validation of critical manufacturing sub-processes

Impact

- Cost reductions of more than 500 €/kW down to 150 €/kW at FC system level
- Manufacturing methods in terms of yield and cost, reducing stack scrap rate
- Decreased materials consumption or/and achieve a higher power density

Other information

- *One project maximum. 3 years. Indicative budget of 4-6 million €*

Transport pillar RIA

Topic 1.3: Development of advanced fuel cell systems and system components

Challenge

- Improvement of functionality, efficiency, manufacturability and cost of automotive application fuel cell technology.

Scope

- Develop low cost fuel cell system components adopting latest system and component level engineering methodologies.
- Provide advanced analysis and concepts for further system simplification, ease of manufacturing and cost reduction at typical automotive volumes

Impact

- Verification of components on test stations
- Validation of components on the level of a fuel cell system
- Prototyping demonstration in a relevant end-to-end environment

Other information

- *4-5 years. Indicative budget of 3-4 million €*

Transport pillar RIA

Topic 1.4: Hydrogen storage standardisation and components optimization for mass production

Challenge

- Meet cost and performance targets of onboard hydrogen storage systems for fuel cell powered vehicles (light and heavy duty).
- Standardisation of systems, processes and components to accelerate market introduction of automotive hydrogen storage technology.

Scope

- Identify and select onboard storage system components
- Align specifications and interfaces
- Define test procedures
- Transfer to industry standards, codes and regulations

Impact

- Hydrogen storage components for standardization on a world-wide level
- Accepted test procedures for selected components
- cost reduction to 800 €/kg H2 stored

Other information

- *One project maximum. 3-4 years. Indicative budget of 3-5 million €*

Topic 1.5: Development of cost effective and reliable hydrogen refuelling station components and systems for fuel cell vehicles

Challenge

- Solve the hydrogen refuelling infrastructure currently part-wise unsatisfactory reliability
- Reduce the relatively high CAPEX of HRSs related to costly components and high HRS complexity.

Scope

- R&D, engineering, prototype manufacturing and/or laboratory testing of key components or complete HRS systems
- R&D and optimization of multiple key components (compression, storage, cooling and refuelling, regulation and control)
- R&D and design of larger scale complete HRS systems

Impact

- Newly developed and laboratory or pilot validated HRS key components and/or complete HRS systems fulfilling MAWP 2017 targets.

Other information

- *One project maximum. 3years. Indicative budget of 4-6 million €*

Transport pillar RIA

Topic 1.6: Engineering studies for large scale bus refuelling

Challenge

- Need of HRS at scale for commercial bus depots (75-300 buses)

Scope

- Detailed engineering design studies for a minimum of five representative bus depots operating at least 75-150 fuel cell buses
- Options for supplying hydrogen to bus depots (off-site and on-site production)
- Assess administrative and practical burdens which large fuelling systems
- Implications of local regulations, codes and standards on the designs

Impact

- Identification of the factors which lead to the lowest costs of hydrogen supply at a range of specific bus depots
- Provide a mechanism to down-select depots for detailed design work if enough regions are interested
- Indicative layouts for the preferred depot design

Other information

- *One project maximum. 1.5-2 years. Indicative budget of 1-2.5 million €*

Topic 1.7: Large scale demonstration of refuelling infrastructure for road vehicles

Challenge

- Improve FCEV technology.
- Strengthen customer acceptance.
- Deployment of a refuelling infrastructure for initially limited vehicle fleet

Scope

- Roll-out of a minimum of 100 FCEVs and 23 HRS.
- Focus on FCEVs which use a fuel cell system as the main power source and 700 bar hydrogen storage systems but range extenders or other storage possible

Impact

- develop, deliver and operate hydrogen refuelling infrastructure and a fleet of FCEVs
- Contribute to coordination of“H2Mobility” initiatives at the European scale

Other information

- *One project maximum. 4-6 years. Maximum funding of 32 million €*

Overarching topics
FCH-02 2014

Topic	Type of Action	Ind. Budget MEURO
3.1: Hydrogen territories	Innovation (IA)	5

Overarching projects IA

Topic 3.1: Hydrogen territories

Challenge

- Demonstrate pioneer hydrogen economy models at territories levels where there is a strong political commitment
- Prove the viability and feasibility of hydrogen economy concept in off-grid areas (isolated territories).

Scope

- Develop and deploy replicable, balanced and integrated fuel cell and hydrogen solutions in both energy and transport fields
- Near/fully autonomous hydrogen buildings/quarters/districts
- Integration of hydrogen refuelling infrastructures and provision of vehicle fleets powered by hydrogen

Impact

- Increase the energy efficiency of isolated territories and the mobility efficiency with lower emissions of pollutants and CO2.

Other information

- *One project maximum. 5 years. Maximum funding of 5 million €*

Energy pillar
FCH-02 2014

Topic	Type of Action	Ind. Budget MEURO
2.1: Research in electrolysis for cost effective hydrogen production	Research & Innovation (RIA)	16
2.2: Decentralized H2 production from clean CO2-containing biogas		
2.3: Stationary fuel cell system diagnostics		
2.4: Production of stationary FCs with reduced quality control costs		
2.5: Innovative FC systems at intermediate power range for distributed CHP		
2.6: Development of centrifugal hydrogen compressor technology		
2.7: Stand-alone H2 purification systems for new hydrogen pathways		
2.8: Improvement of electrolyser design for grid integration		
2.9: Significant improvement of installation and service for FC systems by Design-to-Service	Innovation (IA)	25.5
2.10: Large scale electrolysers providing grid services - supply to multiple markets		
2.11: Large scale FC power plant demonstration in industrial/commercial markets		

Energy pillar RIA

Topic 2.1: Research in Electrolysis for cost effective H2 production

Challenge

- Cost of H2 competitive with that of SMR – halve CAPEX, red. e^- by 10%
- Covers Alkaline, PEM, AEM, SOEC

Scope (KPIs of Water Electrolysis study)

- Simplification of system, size reduction, material reduction, scalability
- New components for improved partial load and dynamic behaviour
- Reduced degradation under partial loads

Impact

- Electrolytic H2 competitive with SMR
- Validation of improvements in cost through breakthroughs in materials, components, systems

Indicative Funding; No. of projects

- EU contribution of 2 – 3 Meuro; 1 project; 4 years

Other information

- TRL 3→5, Eligibility criterion: >1 member of IG or RG

Energy pillar RIA

Topic 2.2: Decentralized hydrogen production from clean CO2-containing biogas

Challenge

- Removal of biogas upgrading step (cleaning from sulphur, removal of CO2) to reduce CAPEX and OPEX and increase η of H2 production

Scope

- Proof of concept of optimised system; demo of techno-economic viability
- Develop catalysts and reactors less susceptible to fouling or poisoning
- Build and operate continuously 50-250 kgH2/day reactor with η 72%
- BoP and burner suitable for operation with lower cv streams

Impact

- Demonstration of CO2-containing reforming on-site
- Reduced H2 cost, improved η of 72% reforming landfill/anaerobic gas

Indicative Funding; No. of projects

- EU contribution of 2.5 – 3 Meuro; 1 project; 3 years

Other information

- TRL 3→6

Energy pillar RIA

Topic 2.3: Stationary FC system diagnostics: development of online monitoring and diagnostics systems for reliable and durable FC system operation

Challenge

- Develop low cost and reliable monitoring techs for stationary FC apps that would allow effective detection & prevention before irreversible damage

Scope

- Develop low cost, on-line monitoring & diagnostics system for existing FCs
- Prevent damages by detecting failure modes (contamination, degradation,..)
- Focus on low cost and easy integration to existing systems

Impact

- Demonstration of system in > 2 different stacks, validation of methodology
- > 5 failure modes detectable (air, fuel starvation, cell cracks, leakages,..)
- <3% increase in overall system cost

Indicative Funding; No. of projects

- EU contribution of 1.5 – 2 Meuro; 1 project, 2-3 years

Other information

- TRL 3-4→5, Eligibility criterion: >1 member of IG or RG

Energy pillar RIA

Topic 2.4: Robust manufacturing of stationary FCs with reduced quality control costs

Challenge

- Stabilisation of manufacturing process & automation of quality control even @ pilot scale, specially for stack qualification
- Adopt and implement quality and process control steps and equipment

Scope

- Develop state of the art quality control tools, transferring touch-less, in-line characterisation methods to FC components manufacturing
- Reduce quality control costs to battery manufacturing levels
- Validate in pilot or series manufacturing line, equipment available for sale

Impact

- Manufacturing process yield > 95%, single step > 98%
- Robustness against variations in raw material & processing parameters

Indicative Funding; No. of projects

- EU contribution of 1.5 – 2 Meuro; 1 project; 2-3 years

Other information

- TRL 5→7, Eligibility criterion: >1 member of IG or RG

Energy pillar RIA

Topic 2.5: Innovative fuel cell systems at intermediate power range for distributed CHP generation

Challenge

- Develop & manufacture new generation of FCs with improved competitiveness

Scope

- Build and validate prototypes of new FC products for CHP apps in 10-100kW
- >3,000 h operation of developed FC systems
- Develop value chains and innovative business models
- Co-generation of H2; heat recovery for co- & poly-generation

Impact

- Electrical η ↑ 10% to reach 57%, total η > 82%
- Improve stack lifetime ↑ 50% reaching 30,000 hours, cost ↓ 30%
- Maintenance interval ↑100% to 2 years per planned shut down

Indicative Funding; No. of projects

- EU contribution of 3.5 Meuro; 2 projects; 3 years

Other information

- TRL 4→5, build upon experience of previous projects

Energy pillar RIA

Topic 2.6: Development of centrifugal hydrogen compressor technology

Challenge

- Develop reliable, cost effective, energy eff. centrifugal compression technology for high mass flow rates (>3,000 m^3/hr)

Scope

- Design and test a centrifugal compressor from 20 to 500 bar; η ↑, cost ↓
- Material should take into account H2 properties
- Validate concept on-site, including η and cost, at least at single stage level

Impact

- Enable manufacturing of large H2 compression systems
- Energy consumption < 4kWh/kg H2 for 20-500 bar compression

Indicative Funding; No. of projects

- EU contribution of 3 Meuro; 1 project; 3 years

Other information

- TRL 3→5

Energy pillar RIA

Topic 2.7: Stand-alone H2 purification systems for new H2 pathways

Challenge

- Develop efficient and low cost stand-alone systems for the purification of H2 coming from industrial H2 pipelines and undergrounds storage caverns

Scope

- Develop and optimise proof-of-concept of H2 purification techs – PEM FC purity levels
- Large scale; stand-alone; close to zero waste
- Low energy consumption, low CAPEX, OPEX (cost of purification 0.15 Euro/kg)

Impact

- H2 losses < 10%
- CAPEX down to 350 Euro/(ton H2/day)

Indicative Funding; No. of projects

- EU contribution of 2 – 3 Meuro; 1 project; 2-3 years

Other information

- TRL 3-4→5-6

Energy pillar RIA

Topic 2.8: Improvement of electrolyser design for grid integration

Challenge

- Provide grid services: start-stop & dynamic operation, high η across load curve
- Reduce CAPEX to 30% by 2020; improvements in stack design, BoP, system eng.

Scope

- Identification & assessment of specs for providing grid services
- System & component optimisation for dynamic operation; understanding of degradation under dynamic operation
- Control system for interaction with grid and RES
- Identification of optimal economics depending on local tariffs and regulations

Impact (2020 KPIs)

- 52 kWh/kg H2 for alkaline, CAPEX 630 Euro/kW; 48kWh/kg H2 for PEM, CAPEX 1,000 Euro/kW; fully grid integrated operation; testing at full scale

Indicative Funding; No. of projects

- EU contribution of 2 – 3 Meuro; 3 years

Other information

- TRL 6+ → 7+, Eligibility criterion: >1 member of IG or RG

Energy pillar IA

Topic 2.9: Significant improvement of installation and service for fuel cell systems by Design-to-Service

Challenge

- Obtain simple to maintain, regulations compliant FC systems
- Elaborate lean after-sales structures that integrate lessons from field demos

Scope

- Reduce service cost including cost of spare parts
- Simplify services to be accomplished by normally trained installers with standard tools
- Reduce down time and on-site technical intervention time

Impact

- µ-CHP: service cost <600Euro/kW/yr, < 4h service time, interval >1 yr
- Mid-CHP: service cost <550/kW/yr, < 8h service time, interval >1-2 yr
- Large CHP: service cost <290Euro/kW/yr, < 300h service time, interval >2yr

Indicative Funding; No. of projects

- EU contribution of 1.5 Meuro, max. 3 projects (1 per FC technology); 3 years

Other information

- TRL 6 → 7

Energy pillar IA

Topic 2.10: Demonstrating the feasibility of central large scale electrolysers in providing grid services and hydrogen distribution and supply to multiple high value markets

Challenge

- Grid balancing services through operation at times of excess or lack of RES e^-
- Large scale demo at sites offering multiple value markets

Scope

- Deploy >1 MW (justified) electrolyser and supporting H2 distribution systems
- 55-60 kWh/kg H2; CAPEX 930 for alkaline and 1,570 for PEM (Euro/kW)
- Commercial contracts to demonstrate benefits from various benefit streams
- Operation > 2 years; tech neutral approach; consortia covering complete chain

Impact

- Confirm capturing of revenue from grid balancing services and supply to various markets; tecno-economic analysis
- Assessment of legislative and RCS implications; recommendations on policy

Indicative Funding; No. of projects

- EU contribution of 14 (1 project) to 16 (2 projects) MEURO; 4 years

Other information

- TRL 5 → 7, Eligibility criterion: >1 member of IG or RG

Energy pillar IA

Topic 2.11: Large scale FC power plant demonstration in industrial/commercial market segments

Challenge

- Achieve market entry of FCs in commercial/industrial segments (50kW-10MW) through realisation of large demos for confidence building & ↓ TCO

Scope

- 50kW-several MW in CHP using biogas, NG or H2; create partnerships
- Validate units in commercial apps; end-users gaining experience
- Develop business plans and service strategies
- Clearly spelled roles for all involved entities

Impact

- Reduce CAPEX <7,000 Euro/kW (<1MW) to < 4,000 Euro/kW (>1MW)
- Reduce use of primary fuel by electrical η > 45%, total η > 70%
- Build trust among stakeholders, participation of consumers, create jobs

Indicative Funding; No. of projects

- EU contribution of 2.5 (<1 MW, 2 projects) to 9 (>1MW, 1 project) MEURO

Other information

- TRL > 7, Eligibility criterion: >1 member of IG or RG; 5 years

Cross-Cutting

TOPIC	TYPE OF ACTION	BUDGET
FCH-04.1-2014: Educational initiatives	Coordination and Support (CSA)	4.5 million EUR
FCH-04.2-2014: Develop strategies to raise public awareness of fuel cell and hydrogen technologies	Coordination and Support (CSA)	
FCH-04.3-2014: Pre-normative research on vented deflagrations in containers and enclosures for hydrogen energy applications	Research & Innovation (RIA)	

Cross-Cutting

FCH-04.1-2014: Educational initiatives

Challenge

- Establish a **network of academic, and other relevant institutions** for education and training in fuel cell and hydrogen.
- Develop and make available **high-quality** and **harmonized** teaching and experimental **materials**.

Scope

- **Graduate and post-graduate** teaching and the equivalent level of vocational training - **continuous professional development**.
- Building on **previous and on-going projects**: TrainHy, HyProfessionals, HyFacts, HyResponse, KnowHy, and others (e.g. US DoE).

Impact

- Network of universities
- Training materials
- Coverage of a reasonable number of EU languages.
- Mutual recognition using European Credit Transfer System (ECTS).
- Web-site and e-learning platform for hosting teaching materials.
- Delivery of pilot courses during the project duration.

Other information

- CSA; 1 project of EUR 1 to 1.5 million and max. duration of 4 years.

Cross-Cutting

FCH-04.2-2014: Develop strategies to raise public awareness of fuel cell and hydrogen technologies

Challenge

- **Make the public (and other stakeholders) aware** of the potential of Fuel Cell and Hydrogen technologies in order to prepare a **commercial market entry**.

Scope

- Increase **public awareness** of fuel cell and hydrogen technologies (in particular to future potential clients).
- Consortium to include **energy transition**, **marketing** and **communication** experts, and **web communication agency**.
- Develop and use of an **internet platform**, **innovative communication tools** and the **social media** to communicate FCH tech. to targeted audiences.

Impact

- Overview study on potential long-term macro benefits.
- Dissemination of the results of the study.
- Supply a one-stop-shop for information on FCH via internet.
- Technical content suitable for the general public
- Supply of demonstrational items (other than vehicles)
- Organisation of public debates in different Member States.

Other information

- CSA; Project active in a minimum of 10 MS, with preferably different languages. 1 project EUR 2 million with expected duration of 3 years.

Cross-Cutting

FCH-04.3-2014: PNR on vented deflagrations in containers and enclosures for hydrogen energy applications

Challenge

- **Hydrogen-energy systems and applications** are commonly designed and integrated into **containers and/or small enclosures**.
- Specific attention where best to apply safety barriers in order to **ensure the highest level of safety for hydrogen energy applications**.

Scope

- Conduct **PNR** on hydrogen-air vented deflagrations in real-scale containers to prepare an **International Standard on "hydrogen explosion venting mitigation systems".**
- Improve the understanding of the **structural response of containers** exposed to a vented explosion.

Impact

- Input to an International Standard on "hydrogen explosion venting mitigation systems".
- Prediction of hydrogen explosion effects for certification and planning purposes by developing, verifying and validating analytical and CFD predictive models.

Other information

- RIA; 1 project of indicative funding EUR 1.5 million and expected duration 3 years

H2020 Rules for Participation

Three main objectives:

Innovation, Simplification and Coherence

(single set of rules, funding rates, indirect cost model etc)

Single set of rules

- Covering all H2020 research and innovation actions

- Keeping flexibility where needed

Single Funding Rate

FP7

Maximum reimbursement rates	Research and technological development activities (*)	Demonstration activities	Other activities
Network of excellence	50% 75% (**)		100%
Collaborative *project*(****)	50% 75% (**)	50%	100%
Coordination and support action			100% (***)

(*) Research and technological development includes scientific coordination.
(**) For *beneficiaries* that are *non-profit public bodies*, secondary and higher education establishments, *research organisations* and *SMEs*
(***) The reimbursement of indirect eligible costs, in the case of coordination and support actions, may reach a maximum 7% of the direct eligible costs, excluding the direct eligible costs for subcontracting and the costs of resources made available by third parties which are not used on the premises of the *beneficiary*.
(****) Including research for the benefit of specific groups (in particular SMEs)

HORIZON 2020

One project = One rate

- For all beneficiaries and all activities in the grant

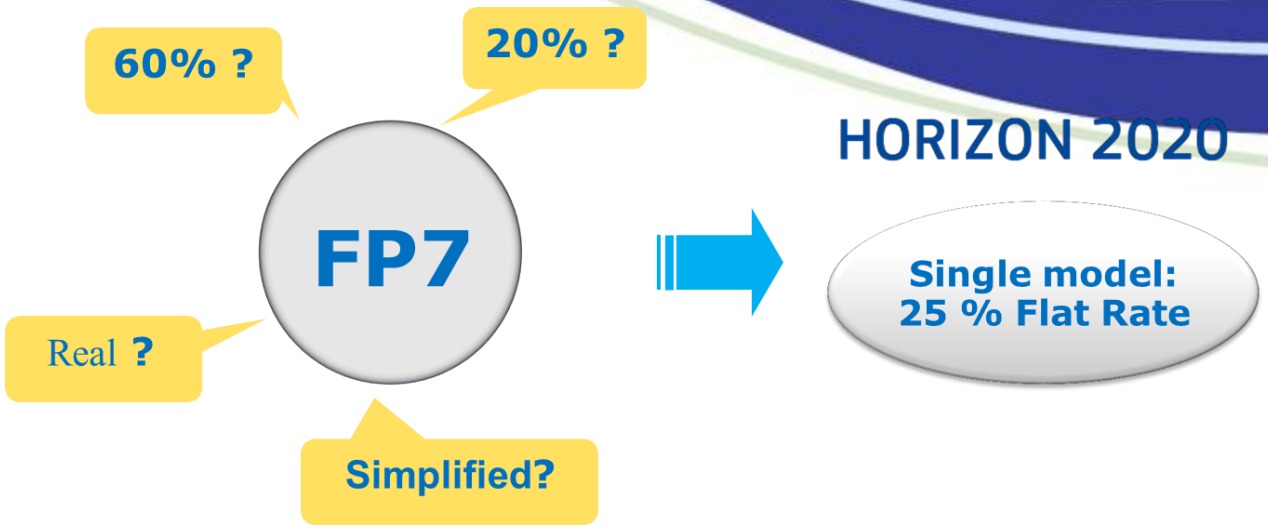
- Defined in the Work Programme / Work Plan:

•Up to 100 % of the eligible costs

•but limited to a maximum of 70 % for innovation projects (exception for non-profit organisations – maximum of 100%)

Single Indirect Cost Model

New funding model – what impact on EU contribution?



An example

FP7 *Majority of HES & RTOs*	Direct costs	Indirect costs	Total costs	% EU contribution	EU contribution
Flat-rate (60%)	100	60	**160**	75%	**€ 120**

HORIZON 2020	Direct costs	Indirect costs	Total costs	% EU contribution	EU contribution
100/25 Funding	100	25	**125**	100%	**€ 125**

Time to Grant

Speeding up the process

A maximum TTG of 8 months

5 months
for informing all applicants on scientific evaluation

3 months
for signature of GA

*Some **exceptions** apply, including complex actions or where requested by applicants*

Grant Preparation rather than negotiation:

- Each proposal evaluated 'as it is', not as 'what could be'
- Final GA based to maximum extent possible on Part B of the proposal (and annexes, if applicable)

Legal entity validated in parallel

No more paper:

e-communication & e-signature of grants

Other Simplification Efforts

Similar evaluation criteria with FP7

- Excellence – Impact – Quality and efficiency of the action

Simpler time-recording requirements

- No time-sheets for personnel working full time on a single project

Fewer Certificates on Financial Statements and fewer but targeted audits

- CFS only if total amount of the grant for the beneficiary as reimbursement of actual costs or average personnel costs is ≥ EUR 325.000 at the time of the payment of the balance
- Audit strategy focused on risk and fraud prevention

Controls and Audits

Financial viability

- Restricted to coordinators for projects ≥ €500 k€

Audit certificates

- Only for final payments/per beneficiary /for actual costs ≥ €325 000 €
- Optional Certificates on average personnel costs

Ex-post audits

- Provisions in **Horizon 2020 Regulations!**
- Commission's audits up to two years after payment of the balance
- Audit strategy focused on risk and fraud prevention

Guarantee Fund

- Continuity with FP7

Conditions for Participation

Minimum conditions:

Standard 'collaborative' actions (RIA/IA)

At least three legal entities each established in a different Member State or an Associated Country*

Coordination and support actions

One legal entity established in a Member State or in an Associated Country

Additional Conditions:

In the work plan: Number of participants, nature of participants etc

Forms of Funding:

We keep the Grant Agreements !

**See Annex A of the General Annexes for list of countries eligible for funding*

The importance of the Annual Work Plan

Annual Work Plan, AWP may:

Restrict eligibility of participants from third countries (e.g. security concerns, reciprocity)

Introduce additional eligibility criteria

Number of participants, type of participant (IG/RG members) and place of establishment

Lay down further details for the application of the award criteria, and specify weighting and thresholds – normally in general annexes

Specify third countries that are eligible for funding

Specify the funding rate for an action

Identify beneficiaries for grants without a call for proposals

International Cooperation

Participation

Open for all legal entities established in third countries and for international organisations

Restrictions only possible if:

introduced in the annual work plan (for reciprocity reasons and/or for security reasons)

Funding *(to be assessed by experts during evaluation)*

Third country identified already in the Annual Work Plan or

Participation deemed by the FCH2 JU essential in the action or

When provided under a bilateral scientific and technological agreement

Intellectual Property Rights, IPR

We keep:

Ownership

- for the participant who generates results,
- joint-ownership only in specific circumstances

Protection

where appropriate

Exploitation

General obligation to exploit the results

Dissemination

principle maintained

Transfer and exclusive licences outside the EU/Associated Countries

the grant agreement may foresee right to object if a participant has received funding

Access rights

for implementation and for exploitation purposes (also for affiliated entities established in MS/AC)

Intellectual Property Rights, IPR *cont.*

What is *NEW:*

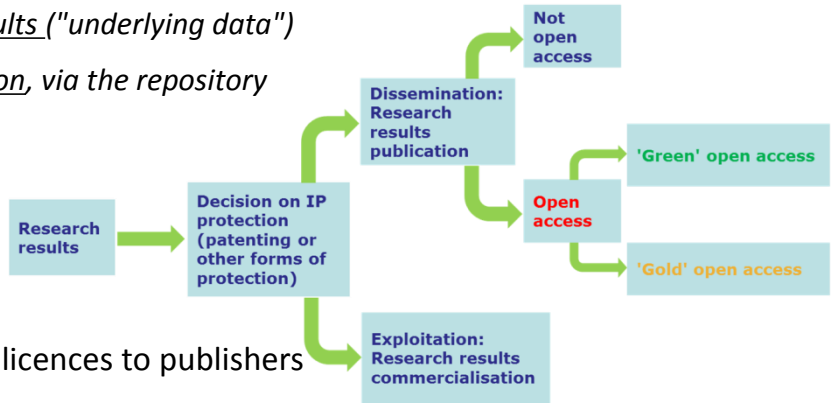
Additional exploitation/dissemination obligations

(as a separate document requested by the Annual work plan, AWP)

Open access (OA): obligatory for scientific publications

Each beneficiary must ensure OA to all peer-reviewed scientific publications relating to its results:

- *Deposit a machine-readable copy of the published version or final peer-reviewed manuscript accepted for publication in a repository of the researchers choice (possibly OpenAIRE compliant)*
- *Ensure OA on publication or at the latest within 6 months*
- *Aim to deposit at the same time the research data needed to validate the results ("underlying data")*
- *Ensure OA to the bibliographic metadata that identify the deposited publication, via the repository*



Costs for OA publishing:

Eligibility of OA publishing costs during the grant (as in FP7)

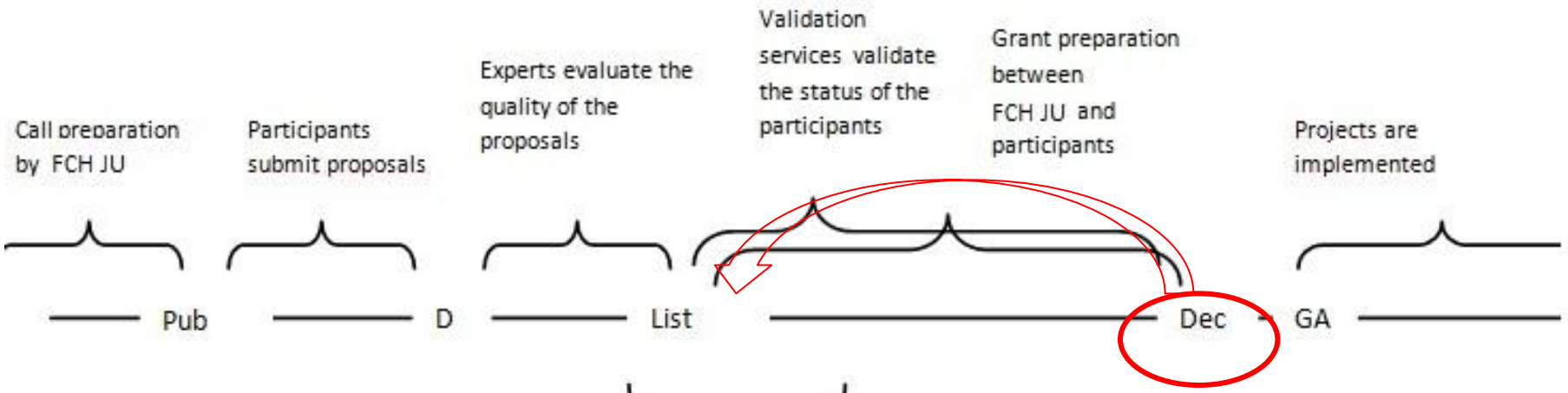
Licencing:

Encouragement to authors to retain their copyright and grant adequate licences to publishers

Pilot on Open Research Data – FCH2 JU is not part of it !

FCH JU projects can participate on a voluntary basis…

Overview of process



Difference to H2020 rules !

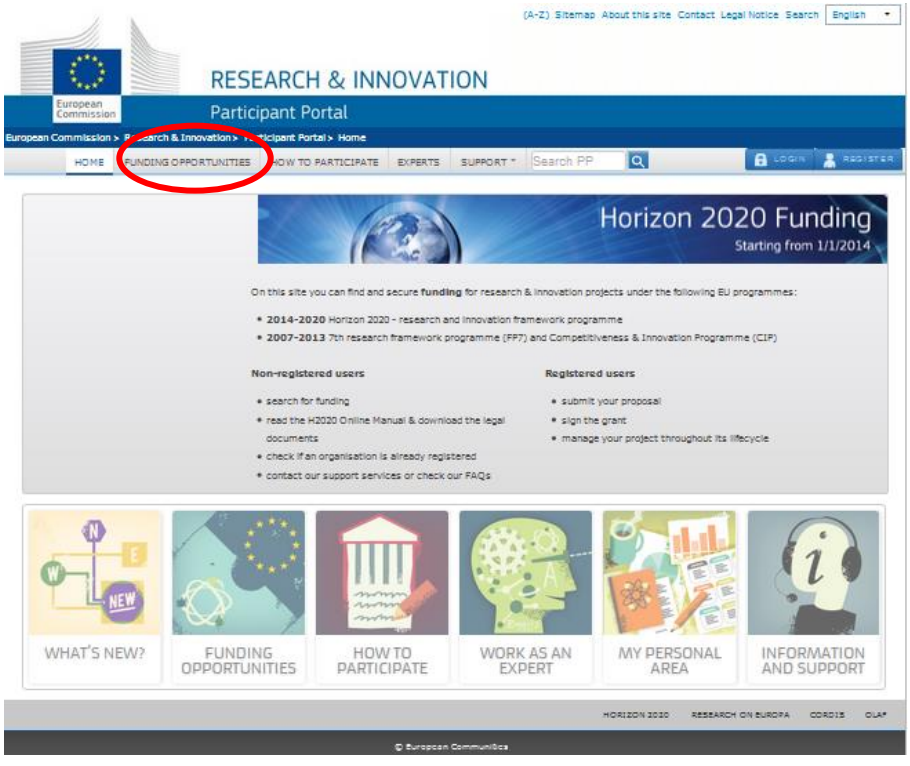
Pub = call is published
D = call deadline
List = ranked list (end of evaluation)
Dec = FCH JU selection/award decision
GA = grant agreement signature

Participant Portal

Funding Opportunities

NEW user-friendly Participant Portal

http://ec.europa.eu/research/participants/portal/desktop/en/home.html



Funding Opportunities page gives a short overview of the information and some **priority highlights** of H2020

- left hand menu: go directly to the **calls** of specific parts of H2020 or click on "Search topics" and **search** funding opportunities just with free **keywords, without having to know the structure of the programme**

Participant Portal

Calls

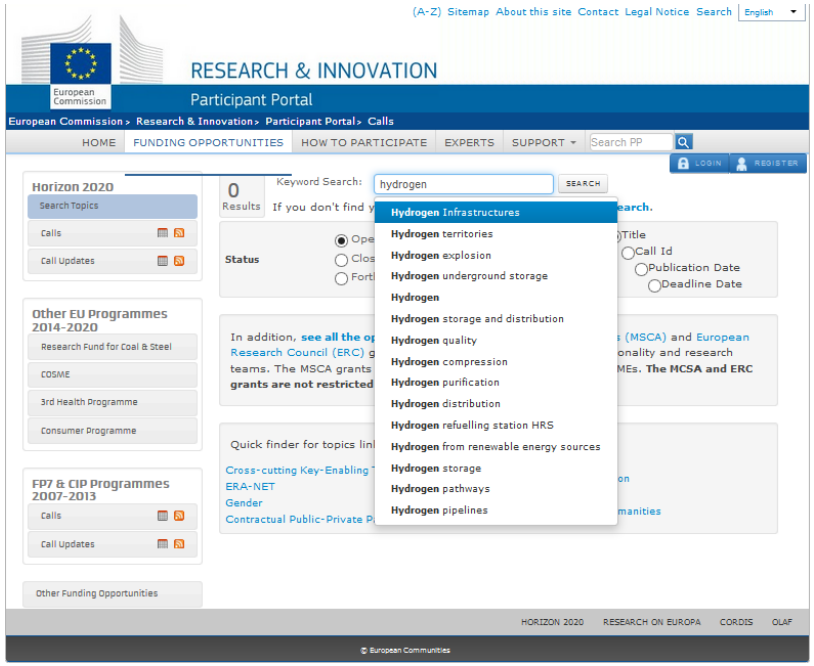
Calls are presented as

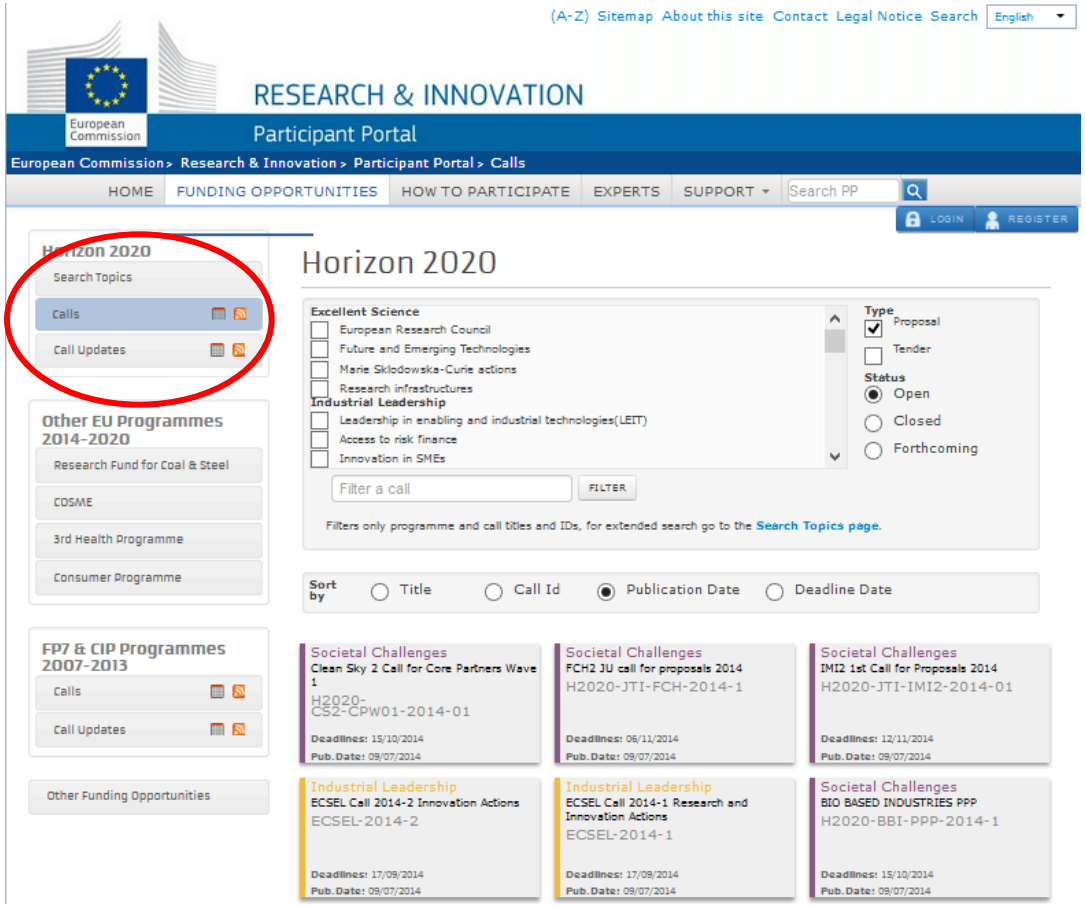
clickable "cards" that lead to the call details.

When landing on the page the user will see all the open calls in the order of their publishing dates (possibility to see forthcoming and open calls when filtering accordingly) The user can also filter calls by programmes and themes)

Newcomers:

searching for call topics by **free keywords without having to know the structure of the programme**





Principles

Getting started

- A call is a list of distinct, separate topics
- <u>A proposal is submitted to one and only one topic</u>
- A topic is linked to one and only one call (the same topic applicable in two years will be considered as two distinct topics)
- A topic can have only one action type ("funding schemes"; e.g. R&I actions, CSA)
- A topic can have only one deadline

<u>First access</u> to the system from each Topic's page

Draft and submitted proposals to be accessed <u>later</u> from the "My Proposals" page

Structure of proposal

Part A

- General information
  Abstract, panel and fixed keyword (if relevant),
  New: declarations, checklist questions
- Participants and contact persons: data is read-only from the Organisation Registry (URF/PDM)
- Budget table – specific per action types
- New: Ethics Issues Table: structured, reference to Part B
- Call specific questions: limited set of specific questions related to the call (IG/RG membership!)
- The system offers validation checks & any problems are listed at the end of the administrative part.

Part B and Annexes

- Templates per calls/topics – downloadable from the system!
- Page limit may apply per attachments. The check is based on pages of the pdf document.
- Watermark to be applied to mark the pages above the limit
- General constraints: 10 MB, PDF
- The complete proposal package receives an e-receipt upon submission.
- New: Separate template for the 'Plan for exploitation and dissemination of results'!

(if applicable, possibility to include additional activities and/or investments along the project to increase impact of results, as part of beneficiaries' business plans)

Front Office
Grant management services

Horizon 2020

Participant Portal integrated services

Submission services

Legal entity services

Grant Management Services

No e-mail

No mail

No blue ink signature

- **Coherent**
- **Transparent**
- **Integrated**
- **Improved services**

Proposal	Legal entity data	Grant Preparation	Financial reporting	Scientific reporting

More information

Call Material http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-jti-fch-2014-1.html

FCH JU official website:
http://www.fch-ju.eu/

European Industry Grouping for a FCH-JTI (NEW-IG):
http://www.fchindustry-jti.eu

New European Research Grouping on FCH (N.ERGHY):
http://www.nerghy.eu

Thank you for your attention !