



POSSIBILITIES OF NATIONAL AND INTERNATIONAL COOPERATION IN THE FIELD OF HYDROGEN ENERGY-RELATED MATERIALS AND TECHNOLOGIES

Project 14

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OUTLINE

- ❖ HORIZON 2020 PROGRAMME
- ❖ MES CALLS (HORIZON 2020 reimbursement funds)
- ❖ FCH JU
- ❖ HORIZON EUROPE PROGRAMME (Cluster 4 and cluster 5)
- ❖ BILATERAL COOPERATION
- ❖ FIT-4-NMP PROJECT

HORIZON 2020 PROGRAMME

- ▶ The total number of funded projects about hydrogen energy related materials and technologies (2014-2020) - 912 (more than 37000)

Domain of application	Number of funded projects
Fundamental research	54
Industrial technologies	91
Transport and mobility	41
Health	21
Society	25
Climate change and environments	81
Energy	99
Food and natural resources	19

Analytical instrument

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-dashboard>

Project database with main project deliverables

[https://cordis.europa.eu/search?q=contenttype%3D%27project%27%20AND%20\(programme%2Fcode%3D%27H2020%27\)%20AND%20\(%27hydrogen%27\)&p=1&num=10&srt=Relevance:decreasing](https://cordis.europa.eu/search?q=contenttype%3D%27project%27%20AND%20(programme%2Fcode%3D%27H2020%27)%20AND%20(%27hydrogen%27)&p=1&num=10&srt=Relevance:decreasing)

DEMONSTRATION OF LARGE SCALE (MIN 20 MW) ELECTROLYSER FOR CONVERTING RENEWABLE ENERGY TO HYDROGEN (11 M,7 participants)

Organization	Country
McPhy Energy Deutschland GmbH	Germany
MCPHY ENERGY ITALIA SOCIETA A RESPONSABILITA LIMITATA	Italy
MCPHY ENERGY	France
INDUSTRIE DE NORA SPA-IDN	Italy
NOURYON INDUSTRIAL CHEMICALS B.V.	Netherlands
NV NEDERLANDSE GASUNIE	Netherlands
HINICIO SA	Belgium
BIOMETHANOL CHEMIE NEDERLAND B.V.	Netherlands

HYDROGEN CARRIERS FOR STATIONARY STORAGE OF EXCESS RENEWABLE ENERGY (1 PROJECT, 2 M, 10 PARTICIPANTS)

Country	Number of participations	%	Funding
Norway	1	10,0%	€ 116 500
France	2	20,0%	€ 427 200
Italy	4	40,0%	€ 589 830
Germany	3	30,0%	€ 865 700

Organization	Country	City	Funding	Organization profile
GKN SINTER METALS ENGINEERING GMBH	Germany	RADEVORMWALD	€ 364 100	http://ec.europa.eu/research/participants/portal/desktop/en/organisations/org_profile.html?pic=991531964
STUEHFF GMBH	Germany	GEESTHACHT	€ 353 500	http://ec.europa.eu/research/participants/portal/desktop/en/organisations/org_profile.html?pic=906251601
ENGIE	France	COURBEVOIE	€ 291 300	http://ec.europa.eu/research/participants/portal/desktop/en/organisations/org_profile.html?pic=999964562
UNIVERSITA DEGLI STUDI DI TORINO	Italy	TORINO	€ 231 800	http://ec.europa.eu/research/participants/portal/desktop/en/organisations/org_profile.html?pic=999861936
TECNODELTA SRL	Italy	CHIVASSO	€ 169 900	http://ec.europa.eu/research/participants/portal/desktop/en/organisations/org_profile.html?pic=986337614
FONDAZIONE BRUNO KESSLER	Italy	TRENTO	€ 148 130	http://ec.europa.eu/research/participants/portal/desktop/en/organisations/org_profile.html?pic=999625450

PARTNER SEARCH

http://ec.europa.eu/research/participants/portal/desktop/en/organisations/org_profile.html?pic=999964562

Partner search: **ENGIE** PIC: 999964562

📍 France - COURBEVOIE 🏢 Private for profit organisation 41 projects funded

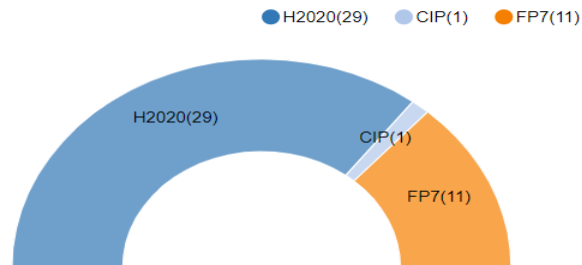
Description

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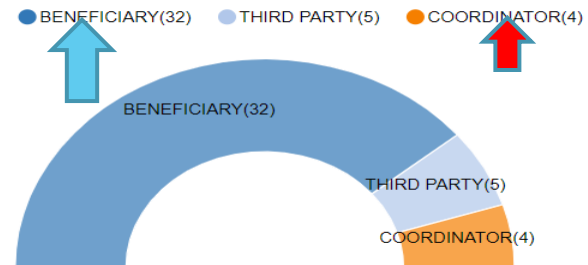
Tags/Keywords

- ▶ Energy collection, conversion and storage, renewable energy
- ▶ Renewable energy sources - general
- ▶ Energy systems (production, distribution, application)
- ▶ Energy systems, smart energy, smart grids, wireless energy transfer
- ▶ Fuel cell technology

Programmes



Roles



Projects list

Results: 41 📄

TITLE	ACRONYM	PROGRAM	PROJECT ID	ACTIONS
Advanced materials and Reactors for ENergy storage th-rough Ammonia	ARENHA	H2020	862482	<input type="button" value="Contact project"/>
Advancing Sustainability of Process Industries through Digital and Circular Water Use Innovations	AquaSPICE	H2020	958396	<input type="button" value="Contact project"/>
An innovative approach for renewable energy storage by a combination of hydrogen carriers and heat storage	HyCARE	H2020	826352	<input type="button" value="Contact project"/>

FUEL CELLS AND HYDROGEN JOINT UNDERTAKINGS

▶ 133 had been funded (<https://www.fch.europa.eu/page/fch-ju-projects>)

within 4 main pillars

energy

transport

overarching

cross-cutting (educational project TeachHy)

29 November, 2021- 3 December 2021 European Hydrogen week (registration is open)

FCH publications (<https://www.fch.europa.eu/publications>)

[Study on Fuel Cells Hydrogen Trucks](#)

[Hydrogen-powered aviation](#)

[Life Cycle Assessment of Hydrogen and Fuel Cell](#)

[Technologies](#)

"HYDROGEN BASED ENERGY STORAGE: STATUS & RECENT DEVELOPMENTS", November 26, 2021

UKRAINE IN HORIZON EUROPE

- ✓ Application form from Ministry of Education of Science of Ukraine had been submitted
- ✓ Several rounds of technical consultation had been arranged
- ✓ Agreement had been signed during summit Ukraine- EU on October 12, 2021, next step - ratification by Verkhovna Rada
- ✓ For all open calls in 2021 participation of Ukrainian organizations are eligible as for associated country
- ✓ The same will be eligible for the first calls of 2022 (deadlines in January and February of 2022)

Horizon 2020 follow up:

- ❑ Уряд ухвалив зміни до Положення про конкурсний відбір наукових, науково-технічних робіт та проєктів, які фінансуються за рахунок зовнішнього інструменту допомоги Європейського Союзу для виконання зобов'язань України в Рамковій програмі Європейського Союзу з наукових досліджень та інновацій «Горизонт 2020».
- ❑ Рішення ухвалено 28 квітня 2021 року, постановою Кабінету Міністрів України в частині розширення напрямів спрямування коштів спеціального фонду, отриманих за рахунок відповідного зовнішнього інструменту допомоги Європейського Союзу. (<https://mon.gov.ua/ua/news/zmineno-poryadok-konkursu-naukovih-robit-ta-innovacijnih-proyektiv-yaki-finansuyutsya-v-mezhah-dopomogi-yes-ukrayini-u-programi-gorizont-2020-rishennya-uryadu>)
- ❑ November 11, 2021 call had been published (<https://mon.gov.ua/ua/news/mon-ogoloshuye-start-konkursu-proyektiv-yaki-finansuyutsya-za-rahunok-zovnishnogo-instrumentu-dopomogi-yes>)

deadline – December 20, 2021, special presentation
<https://www.dropbox.com/s/dg82rflnctng76/konkurs.prezent.2021.23.09.pdf?dl=0>

HORIZON EUROPE STRUCTURE

Horizon
Europe



CLUSTER 4: DIGITAL, INDUSTRY, SPACE

➤ DESTINATION 1 - CLIMATE NEUTRAL, CIRCULAR AND DIGITISED PRODUCTION

(green, flexible and advanced manufacturing, advanced digital technologies for manufacturing, - made in Europe partnership; new way to build, accelerating disruptive change in construction - Built4People partnership, hubs for circularity, a steppingstone towards climate neutrality and circularity in industry, enabling circularity of resources in the process industries, including waste and CO₂/CO - processes4Planet partnership)

➤ DESTINATION 2 - INCREASED AUTONOMY IN KEY STRATEGIC VALUE CHAINS FOR RESILIENT INDUSTRY

(novel paradigms to establish resilient and circular value chains - Processes4Planet Partnership, raw materials for EU open strategic autonomy and successful transition to a climate-neutral and circular economy, green and sustainable materials, materials for the benefit of society and the environment and materials for climate-neutral industry, materials and data cross-cutting actions, improving the resilience and preparedness of EU businesses, especially SMEs and Startups,

➤ DESTINATION 3 - WORLD LEADING DATA AND COMPUTING TECHNOLOGIES (Data sharing in the common European data spaces , Strengthening Europe's data analytics capacity and etc.)

➤ *special attention to KSO - key strategic orientations from Horizon Europe Strategic Plan*

https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-4-digital-industry-and-space_en

CLUSTER 4: DIGITAL, INDUSTRY, SPACE

▶ **DESTINATION 4 - DIGITAL AND EMERGING TECHNOLOGIES FOR COMPETITIVENESS AND FIT FOR THE GREEN DEAL**

(ultra-low power processors, European Innovation Leadership in Electronics , European Innovation Leadership in Photonics -Photonics Partnership, 6G and foundational connectivity technologies, Innovation in AI, Data and Robotics, **European leadership in Emerging Enabling Technologies**, Flagship on Quantum Technologies: a Paradigm Shift, 2- D materials)

▶ **DESTINATION 5 - OPEN STRATEGIC AUTONOMY IN DEVELOPING, DEPLOYING AND USING GLOBAL SPACE-BASED INFRASTRUCTURES, SERVICES, APPLICATIONS AND DATA**

(Foster competitiveness of space systems , Reinforce EU capacity to access and use space and etc.)

▶ **DESTINATION 6 - A HUMAN-CENTRED AND ETHICAL DEVELOPMENT OF DIGITAL AND INDUSTRIAL TECHNOLOGIES**

(Leadership in AI based on trust, Intellectual properties, etc.)

➤ *special attention to KSO - key strategic orientations from Horizon Europe Strategic Plan*

https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-4-digital-industry-and-space_en

CLUSTER 5. CLIMATE, ENERGY AND MOBILITY

- ▶ DESTINATION 1-CROSS-SECTORAL SOLUTIONS FOR THE CLIMATE TRANSITION
- ▶ DESTINATION 2 - SUSTAINABLE, SECURE AND COMPETITIVE ENERGY SUPPLY
- ▶ DESTINATION 3 - EFFICIENT, SUSTAINABLE AND INCLUSIVE ENERGY USE
- ▶ DESTINATION 4 - CLEAN AND COMPETITIVE SOLUTIONS FOR ALL TRANSPORT MODES
- ▶ DESTINATION 5 - SAFE, RESILIENT TRANSPORT AND SMART MOBILITY SERVICES FOR PASSENGERS AND GOODS
- ▶ *European Partnership on Clean Hydrogen had been established (Activities specifically targeting fuel cells and hydrogen, clean aviation)*
- ▶ *European Commission's Green Deal all actions related to **hydrogen and fuel cells** funded under this work programme shall report directly or indirectly on an annual basis in a secure online data collection platform managed by the Clean Hydrogen Joint Undertaking*

HORIZON-CL5-2021-D3-03-02. NEXT GENERATION OF RENEWABLE ENERGY

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 33.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-4 by the end of the project – see General Annex B.

Partner search

Organisations are looking for collaborating partners for this topic

95

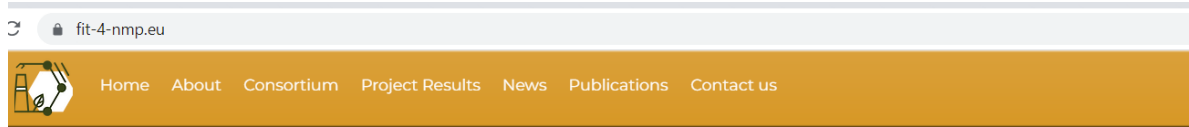
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Production of renewable hydrogen directly from renewable energy sources is within the scope of the topic.

Deadline – February 22, 2022

<https://ec.europa.eu/info/fundingtenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2021-d3-03-02>

COMMUNICATION WITH CURRENT PROJECTS: FIT-4-NMP



Strategic and targeted support to incentivise talented newcomers to NMP projects under Horizon Europe

Grant agreement ID: 958255
Start date 1 January 2021
End date 31 December 2023
Overall budget € 1 500 000
Coordinated by INTELLIGENTSIA
CONSULTANTS SARL
(Luxembourg)
10 partners
NASU from Ukraine
<https://www.fit-4-nmp.eu/>

Organize innovation workshops between talented newcomers and NMP Top Innovators;

- Provide hands-on support to talented newcomers to prepare NMP proposals for Horizon Europe;
- Facilitate networking for talented newcomers at major European conferences and regional brokerage events;
- Provide training to talented newcomers on technology-transfer, proposal writing, and use of European networking portals.

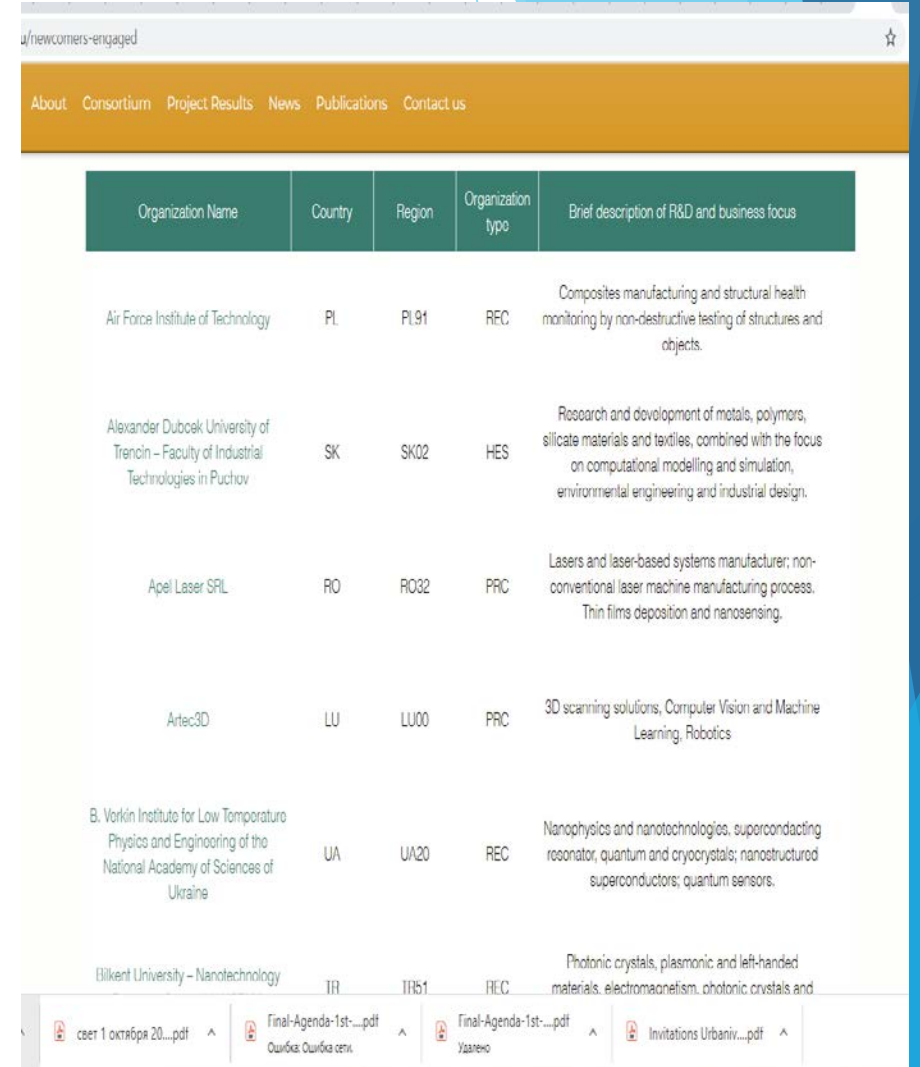
FIT-4-NMP will be undertaken by a strong consortium with partners located among many of the EU member states with the lowest participation in H2020 NMBP. Also, these partners represent “umbrella” organizations with extensive networks to innovative NMP organizations and talented newcomers in their regions.

COMMUNICATION WITH CURRENT PROJECTS: FIT-4-NMP

SUBMISSION OF IDENTIFICATION FORM:

- general information about an organisation;
- main activities relevant to NMP;
- R&D achievements & interests relevant to NMP;
- European & International level NMP-relevant R&D projects and proposals (other than H2020 NMP);
- national & regional level NMP-relevant R&D projects and proposals;
- choose NMP domain from proposed list;
- contacts

One form for one organization!



u/newcomers-engaged

About Consortium Project Results News Publications Contact us

Organization Name	Country	Region	Organization type	Brief description of R&D and business focus
Air Force Institute of Technology	PL	PL91	REC	Composites manufacturing and structural health monitoring by non-destructive testing of structures and objects.
Alexander Dubcek University of Trencin – Faculty of Industrial Technologies in Puchov	SK	SK02	HES	Research and development of metals, polymers, silicate materials and textiles, combined with the focus on computational modelling and simulation, environmental engineering and industrial design.
Apel Laser SRL	RO	RO32	PRC	Lasers and laser-based systems manufacturer; non-conventional laser machine manufacturing process. Thin films deposition and nanosensing.
Artec3D	LU	LU00	PRC	3D scanning solutions, Computer Vision and Machine Learning, Robotics
B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine	UA	UA20	REC	Nanophysics and nanotechnologies, superconducting resonator, quantum and cryocrystals; nanostructured superconductors; quantum sensors.
Etilkent University – Nanotechnology	TR	TR51	REC	Photonic crystals, plasmonic and left-handed materials, electromagnetism, photonic crystals and

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Green hydrogen & syngas for industrial application like direct iron reduction – *Deutsches Zentrum für Luft- und Raumfahrt*

Partner sought (type-role)/ Technology/Expertise needed

Partner sought (type-role):

- Iron & steel manufacturing industrial players.
- Green hydrogen production companies.
- Industrial partner with long term interest in direct iron reduction with green hydrogen and syngas.
- Engineering design & system integration companies.

Technology:

- Direct Iron Reduction process.
- Green hydrogen production and intergration into industrial processes.

Expertise needed:

- Partners for a comprehensive improvement & demonstration of direct reduction plant for flexibly operation with green hydrogen and syngas.
- Intergration into existing iron and steel making plants.

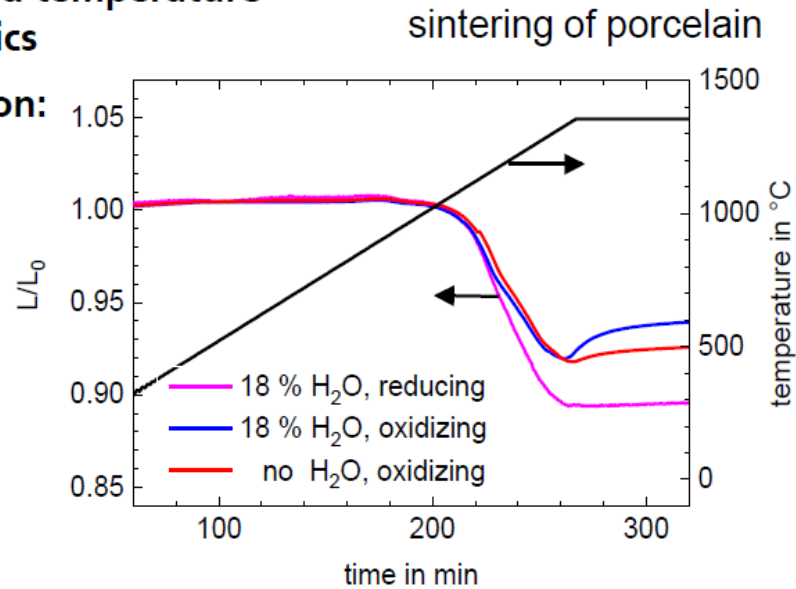


OBJECTIVE

- Hydrogen leads to changes in the process atmosphere and temperature especially for powder-metallurgical processes incl. ceramics
- Atmosphere and temperature have significant influence on:
 - sintering behavior
 - material properties
 - aging of insulation & equipment

TOPIC to be addressed

- Design & adaptation of heating processes in industrial furnaces
- In-situ characterization & development of thermo-process equipment with respect to atmosphere stability and sensor development
- Adaptation of processes to minimize material & energy losses using experimental data in combination with FE-simulation and AI-methods



THANK YOU FOR YOUR ATTENTION !

Dr. Iryna Bilan

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