

Horisontti Eurooppa Klusteri 5 ja sen työohjelma 2021

Ilmasto, energia ja liikenne

Webinaari 25.3.2021

Business Finland ja Suomen akatemia

HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

Horisontti Eurooppa –hakuinfo (CL5) agenda

- 14:00 Tervetuloa ja päivän ohjelma
Tom Warras, NCP Cluster 5
Euroopan komission strategiset tavoitteet
Reijo Munther, Cluster 5 delegate
Yhteiskunnallinen ulottuvuus
Katja Marjanen, NCP Cluster 2
- 14:30 Ilmastotiede ja ilmaston neutraalius (destinaatio 1)
Heini Günther, NCP Clusters 4-6
- 14:40 Akut ja läpimurtoteknologiat (destinaatio 2)
Reijo Munther, Cluster 5 delegate
- 14:50 Energiantuotanto ja -järjestelmät (destinaatio 3)
Tom Warras, NCP Cluster 5
- 15:15 Rakennusten energiatehokkuus (destinaatio 4)
Pekka Rantala, NCP Cluster 4 (3-5)
- 15:25 Puhdas liikenne: maa/meri/ilma (destinaatio 5), ja
Älykäs liikenne (destinaatio 6)
Tom Warras, NCP Cluster 5
- 15:50 Kysymykset - Tilaisuus päätyy klo 16:00.



Horisontti Eurooppa vv. 2021 – 2027: ~95 mrd. €

25 mrd. €
(26,2 %)

Pilari 1
Huipputason tiede

Euroopan tutkimusneuvosto (ERC)

Marie Skłodowska-Curie –toimet
(MSCA)

Tutkimusinfrastruktuurit

3,4 mrd. €
(3,5 %)

Osallistumispohjan laajentaminen ja eurooppalaisen tutkimusalueen (ERA) vahvistaminen

Osallistumispohjan laajentaminen ja huippuosaamisen levittäminen

53,5 mrd. €
(56 %)

Pilari 2
Globaalit haasteet ja Euroopan teollisuuden kilpailukyky

- Klusterit:**
1. Terveys
 2. Kulttuuri, luovuus ja osallisuutta edistävä yhteiskunta
 3. Kansalaisturvallisuus yhteiskunnassa
 4. Digitaalitalous ja -teknologia, teollisuus ja avaruuus
 - 5. Ilmasto, energia ja liikkuvuus**
 6. Elintarvikkeet, biotalous, luonnonvarat, maatalous ja ympäristö

Yhteinen tutkimuskeskus (JRC)

13,6 mrd. €
(14,2 %)

Pilari 3
Innovatiivinen Eurooppa

Euroopan innovaationeuvosto (EIC)

Euroopan innovaatioekosysteemit

Euroopan Innovaatio- ja teknologian instituutti (EIT)

Miksi minun pitäisi olla kiinnostunut EU-rahoituksesta?

- ✓ **Rahoitus seuraa aina osaamista!**
- ✓ Löydä, tee yhteistyötä ja kehitä **parhaan** akateemisen ja kaupallisteollisen **osaamisen** kanssa.
- ✓ Myötävaikuta tuleviin **standardeihin**, toimintaympäristöön ja regulaatioon.
- ✓ Hanki **riippumaton arvointi** tuotekehityksen eri vaiheisiin (problem-solution & product-to-market-fit)!
- ✓ **Kilpailijasi** hyödyntää EU-rahoitusta joko suoraan (esim. Horizon 2020/EU: TOP 20 –yritykset listalla mm. GE Avio/Italia ja IBM Research/CH) tai yhteistyökumppaneiden avulla.
- ✓ **Jaa innovaatioaihiosi liiketoimintariskiä!**
- ✓ Rakenna kansainvälistä **T&K-verkostoja, arvoketjuja ja kaupallisia kanavia**.
- ✓ Löydä ja hyödynnä yhteistyökumppaneiden osaamispääomaa ja immateriaalioikeuksia sekä esimerkiksi tietoaltaita tai tulevia ohjelmistorajapintoja.

Keskeisimmät rahoitusinstrumentit (avustus)


Research & Innovation Actions (RIA)
100%


European Research Council (ERC)
100%


SME Funding
EIC Accelerator
70% + blended finance

+25% flat-rate


Innovation Actions (IA)
70% / non-profit 100%


Coordination and Support Actions (CSA)
100%


Marie Skłodowska-Curie (MSCA)
Up to 100%



Prizes



PCP/PPI
100%



CoFund
30% - 70%

Technology Readiness Level –asteikko määrittää sinulle sopivan hakutyyppin

TRL 1 – basic principles observed

TRL 2 – technology concept formulated

TRL 3 – experimental proof of concept

TRL 4 – technology validated in lab

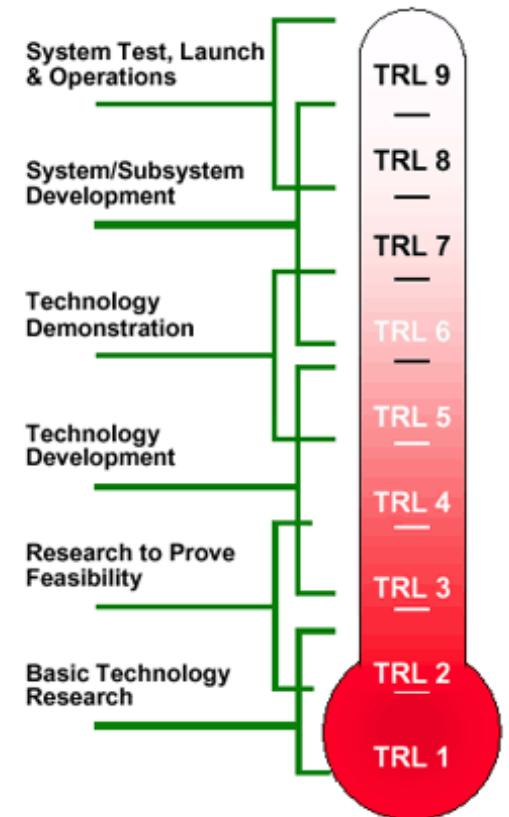
TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)

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

TRL 7 – system prototype demonstration in operational environment ~“**Pilot**”

TRL 8 – system complete and qualified ~“**Large-scale pilot**”

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



Yleisimmät konsortiohankemuodot pähkinänkuoreessa

	Research and Innovation Action (RIA)	Innovation Action (IA)
Public money source	European Commission	European Commission
Focus company	SME, LE	SME, LE
Typical funding/company (EUR)	Depends on the call (0,25-1,0 M)	Depends on the call (0,25-1,0 M)
Funding rate for company	100 % + 25 %	70 % + 25 %
Funding type	Grant	Grant
Business case	Top down (within scope)	Top down (within scope)
Consortium structure	Min 3 from min 3 MS/AC	Min 3 from min 3 MS/AC
Typical coordinator	RTO, LE	RTO, LE (preferably)
Typical duration	36-48 mo	36-48 mo
Typical TRL scope	4-7	5-8
Application dates/cut-offs	Depends on the call	Depends on the call

<i>AC</i>	<i>Assoiated Country (with EU)</i>
<i>LE</i>	<i>Large Enterprise</i>
<i>MS</i>	<i>Member State</i>
<i>RTO</i>	<i>Research and Technology Organization</i>
<i>SME</i>	<i>Small and Medium Sized Company</i>
<i>TRL</i>	<i>Technology Readiness Level (1-9)</i>

Miten mukaan Horisontti Eurooppaan?

EUTI (EU:n tutkimus ja innovaatio-ohjelmien asiantuntija ja kansallinen yhteystoimisto)

KOMITEAJÄSENET & NCP-YHTEYSHENKILÖT
- maksutonta, kaikille tarjolla, julkista neuvontaa

TIETOA,
NEUVONTAA
OPASTUSTA

TYÖOHJELMAN
LUKEMISTA
KANSSASI

KOULUTUSTA
TAPAHTUMIA

OHJAAMISTA
OIKEALLE
“LUUKULLE”

HAKEMUSTEN
KOMMENTOINTIA

TILASTODATAA &
SEURANTATIEOJA

Euroopan komission strategiset tavoitteet

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HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

Relevant programs for 2021–2027 in EU's multiannual financial framework

Horizon Europe
(research and innovation funding)
94 B€

Digital Europe
(deployment of digital technologies)
8 B€

Connecting Europe Facility CEF2
(transp., energy, digital)
21 B€

InvestEU Fund
(loans, guarantees, capital)
Total investm. 3-400 B€

LIFE Programme
(environment and climate action)
5.4 B€

EU4Health
(strengthens health security)
6 B€

Recovery and Resilience Facility RRF
(NextGenerationEU)
864 B€

Horizon Europe (HEU) vision

- Accelerate the twin (green and digital) transition
- Accelerate Europe's recovery, preparedness and resilience. Increase autonomy in value networks
- Increase inclusiveness
- The need for a strong research, education and innovation foundation, grounded in scientific excellence and competitive innovation policies

EU's strategic orientations



Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations



Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems



Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment



Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

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Työohjelman teemat (Cluster 5)

Climate	Energy	Mobility
<ul style="list-style-type: none">• Climate sciences and responses• Batteries• Breakthrough technologies• Citizens and stakeholder engagement• Communities and cities <p>643 M€ 2021–22</p>	<ul style="list-style-type: none">• Renewables• Energy system and grid• Carbon capture, utilisation, storage• Energy efficient buildings• Industrial decarbonisation <p>1.435 M€ 2021–22</p>	<ul style="list-style-type: none">• Zero-emission road transport• Aviation• Waterborne transport• Impact of transport on..• Connected, cooperative and automated mobility• Safety and resilience• Multimodal and sustainable transport systems <p>891 M€ 2021–22</p>

Klusteri 5: Ilmasto, energia, liikkuvuus – 15 mrd.€

Klusteri 5:n työohjelmassa on 6 tavoitekokonaisuutta (destinations), joihin kuuluu 188 hakuotsikkoa (topics). Osa klusterin 11 kumppanuusohjelmista järjestää haut osana työohjelmaa, lopuilla on omat hakumenettelyt.

1. Climate changes
and responses

2. Cross-sectoral
solutions for the
climate transition

3. Sustainable,
secure and
competitive
energy supply

4. Efficient,
sustainable and
inclusive energy
use

5. Clean and
competitive
solutions for all
transport modes

6. Safe, Resilient
Transport and
Smart Mobility
services

- Digitaalisuuden edistäminen ja tavoite ilmastoneutraalista Euroopasta edellyttää isoja muutoksia energiaan ja liikenteeseen liittyvissä toiminnoissa. Ilmastotutkimuksen avulla tuotetaan tietoa mm. ilmastoneutraaliuden saavuttamiseksi tai ilmastomuutoksen ehkäisyn .

Cluster 5 calls 2021–22: Overview of final WP

Huom! Aineisto perustuu 24.2.21 työohjelmaan. Budjettiluvut ovat ajan tasalla, mutta on tiedossa, että **haut eivät avaudu 15.4.** kuten tässä aineistossa lukee. Ensimmäisten hakujen päivämäärät siirtyvät eteenpäin.

D1 Climate sciences and responses for the transformation (136 + 51 + 87 M€)			
Call	Deadline	Area	Topics
21-D1-01	7.9.21	CSR	9
22-D1-01-	I 10.2.22		
two-stage	II 27.9.22	CSR	3
22-D1-02	10.2.22	CSR	5

D2 Cross-sectoral solutions for the climate transition (231 + 138 M€)			
Call	Deadline	Area	Topics
21-D2-01	19.10.21	BAT	7
21-D2-01	19.10.21	BT	4
21-D2-01	19.10.21	CC	4
21-D2-01	19.10.21	CS (DUT)	1
22-D2-01	6.9.22	BAT	10
		CS	
22-D2-01	6.9.22	(CIVITAS)	1

(66 + 38 + 54 + 86 M€)

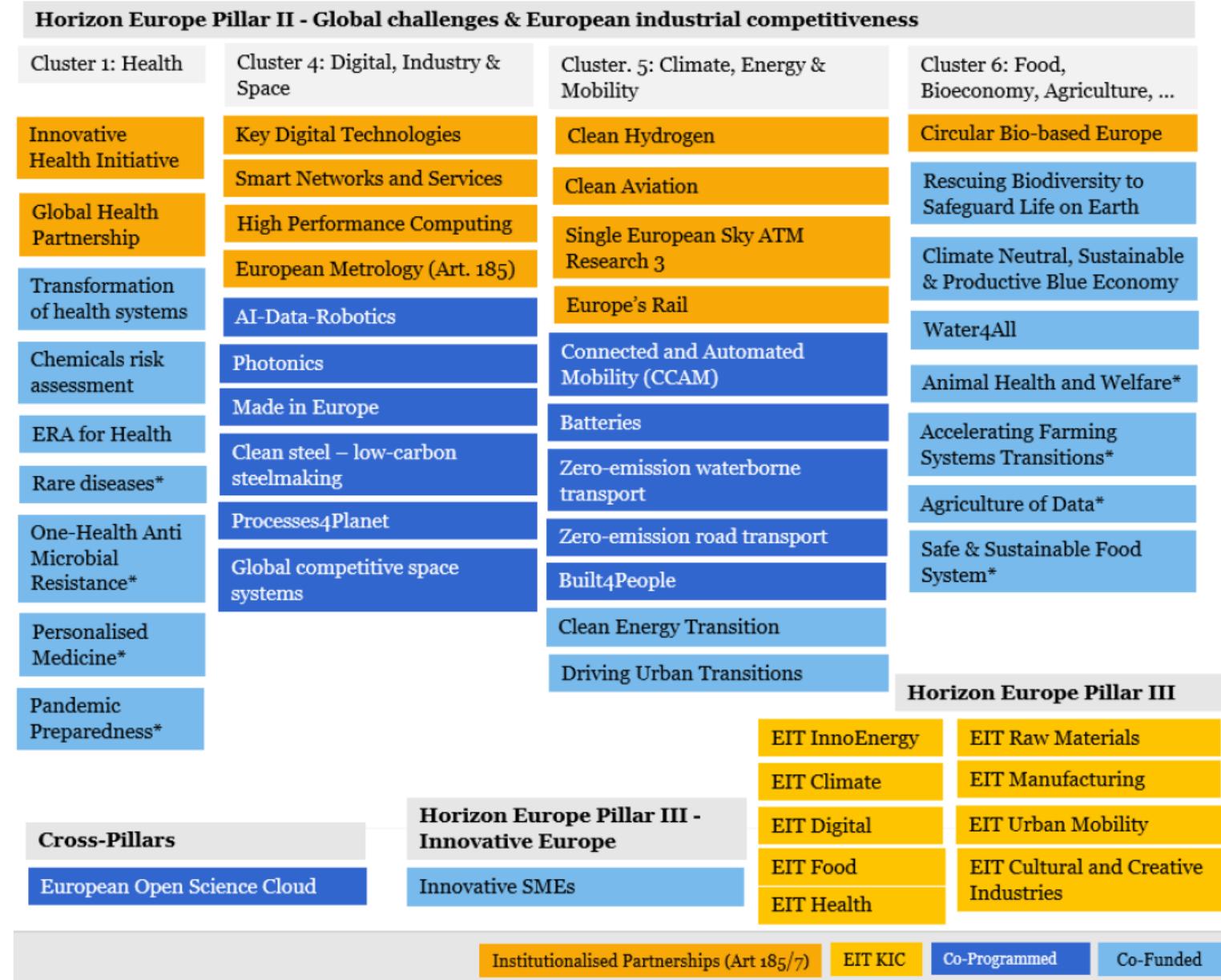
D3 Sust. secure & competitive energy supply (304 + 280 + 381 + 99 + 127 M€)			
Call	Deadline	Area	Topics
21-D3-01	26.8.21	RES	4
21-D3-01	26.8.21	ESGS	10
21-D3-01	26.8.21	CCUS	2
21-D3-01	26.8.21	CC	2
21-D3-01	26.8.21	CC (CETP)	1
21-D3-02	5.1.22	RES	16
22-D3-01	23.2.22	RES	7
22-D3-01	23.2.22	ESGS	7
22-D3-01	23.2.22	CCUS	1
22-D3-02	27.10.22	RES	8
22-D3-03	10.1.23	RES.	9

D4 Efficient, sustainable, inclusive energy use			
Call	Deadline	Area	Topics
21-D4-01	19.10.21	BEE	3
21-D4-01	19.10.21	IND	2
21-D4-02	25.1.22	B4P	3
22-D4-01	6.9.22	BEE	3
22-D4-01	6.9.22	IND	2
22-D4-02	24.1.21	B4P	5

D5 Clean solutions for all transport modes (258 + 253 M€)			
Call	Deadline	Area	Topics
21-D5-01	7.9.21	ZERT	4
21-D5-01	7.9.21	AVI	2
21-D5-01	7.9.21	WAT	8
21-D5-01	7.9.21	THE	2
21-D5-01	7.9.21	CC	1
22-D5-01	26.4.22	WAT	6
22-D5-01	26.4.22	THE	1
22-D5-01	26.4.22	ZERT	4
22-D5-01	26.4.22	AVI	3

D6 Safe, resilient transport and smart mobility services (167 + 122 + 91 M€)			
Call	Deadline	Area	Topics
21-D6-01	19.10.21	CCAM	6
21-D6-01	19.10.21	MSTS	3
21-D6-01	19.10.21	SAFE	4
22-D6-01	12.1.22	CCAM	5
22-D6-01	12.1.22	SAFE	3
22-D6-02	6.9.22	MSTS	7

Overview of 49 candidate **European Partnerships** according to Horizon Europe structure



SSH

Integration of social sciences and humanities in Cluster 5

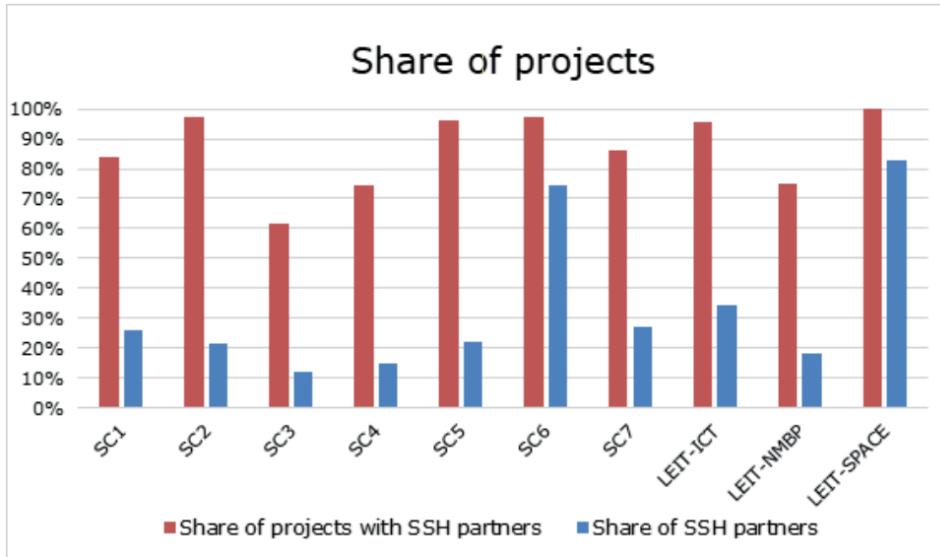
Yhteiskuntatieteiden ja humanististen alojen
merkitys 5-klusterin hauissa

Katja Marjanen, NCP Cluster 2 Culture, creativity and inclusive society
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HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

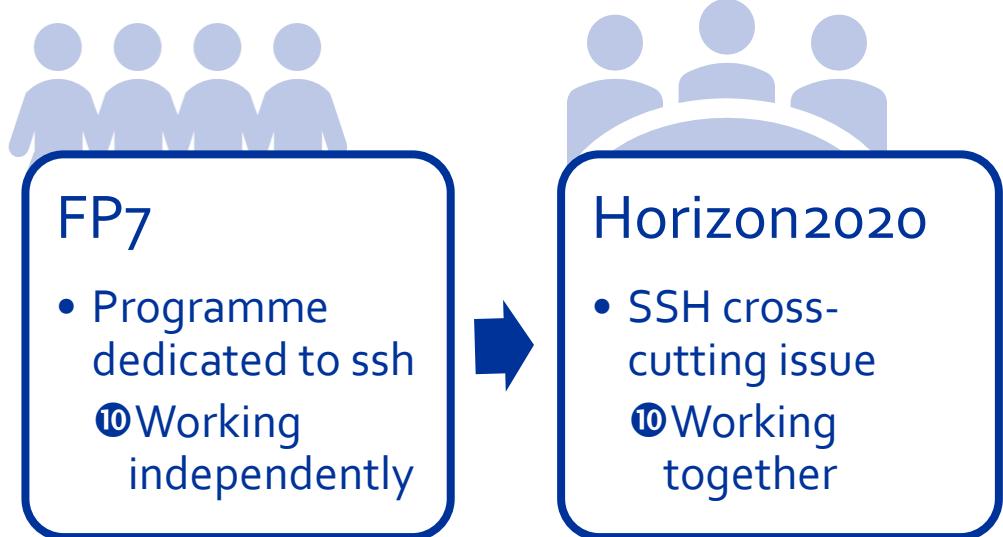
Why is SSH relevant for you?



SSH-integration matters:

1. You will include new perspectives and therefore improve the quality of your project
2. In H2020 majority of funded projects included ssh partners

Integration of social sciences and humanities



What & why?

- Societal challenges too complex
- Not overcome by a single scientific discipline
- Technical solutions not enough.
- Lasting societal impacts rely on insights from social sciences and the humanities.
- Improved integration of SSH expected to strengthen societal impact, broaden citizen engagement and lead to a better future.

Integration of social sciences and humanities: What's new in Horizon Europe?

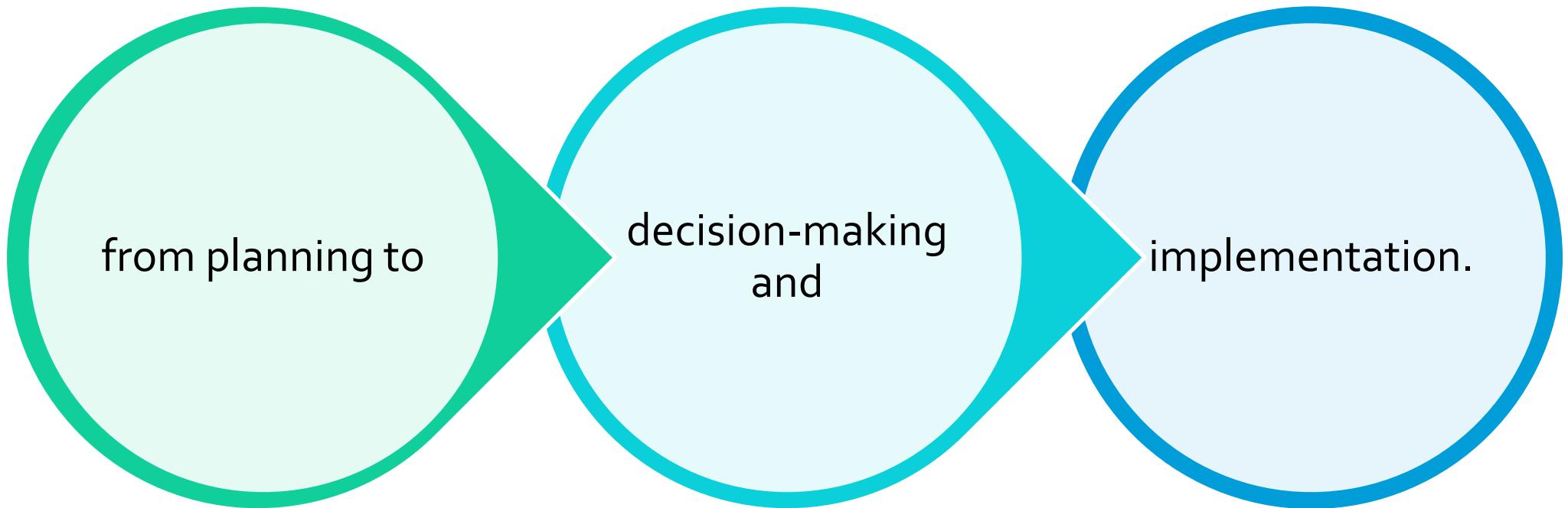
SSH integration was already a cross-cutting principle under Horizon 2020

- SSH-flagging of topics
- Yearly monitoring of SSH integration

In Horizon Europe SSH integration will be

- More holistic (applying across the entire program and over the entire cycle)
- More explicit (expected societal impacts clearly set out)
- More forceful (explicitly evaluated and followed-up)

SSH in Cluster 5: Engaging and enabling citizens to participate in the clean energy transition:



SSH integration: Check the description in the work programme

This topic requires the **effective contribution of SSH disciplines** and the **involvement of SSH experts, institutions** as well as the inclusion of **relevant SSH and gender expertise**, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

- HORIZON-CL5-2021-D1-01-04: Enhanced integrated assessment in pursuit of global climate goals
- HORIZON-CL5-2021-D1-01-06: Supporting and standardising climate services
- HORIZON-CL5-2022-D1-01-03-two-stage: Social science for land-use strategies in the context of climate change and biodiversity challenges
- HORIZON-CL5-2022-D1-02-04: Supporting the formulation of adaptation strategies through improved climate predictions in Europe and beyond
- HORIZON-CL5-2022-D1-02-05: Let nature help do the job: Rewilding landscapes for carbon sequestration, climate adaptation and biodiversity support

How to do SSH integration successfully



Include partners with **relevant ssh competence**

Read carefully what kind of is asked for in the call text
Do not “tick the box” but include only relevant expertise that is needed for the project



Include ssh partners **already in the writing phase**

This will ensure that you get the right expertise already in the project planning phase
The application will be more convincing



Do not leave this to the last minute:
it needs time and good planning

Making sure that interdisciplinary project are successful needs communication and might need a bit more time.

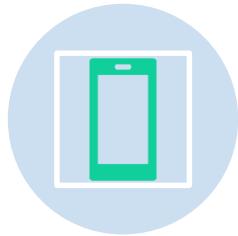
Where to find SSH partners



OWN NETWORKS,
OWN UNIVERSITY



PARTICIPANT
PORTALS PARTNER
SEARCH



NET4SOCIETY
PLATFORM



BROKERAGE EVENTS



ASK NCPS FOR
ADVICE

D1

Destinaatio 1 (2021)

Ilmastotiede ja keinot
ilmastoneutraaliuden saavuttamiseksi

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HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

Cluster 5: Climate, Energy, Mobility – 15 mrd. € (2021-2027)

WP 2021-2022; 6 Destinations

1. Climate sciences and responses for the transformation towards climate neutrality

2. Cross-sectoral solutions for the climate transition

3. Sustainable, secure and competitive energy supply

4. Efficient, sustainable and inclusive energy use

5. Clean and competitive solutions for all transport modes

6. Safe, Resilient Transport and Smart Mobility services for passengers and goods

CL5 Destination 1 background:

- To contribute to HE Strategic key orientations (KSOs) Cluster 5 will deliver on six expected impacts
- Each expected impact has been transformed into a specific Destination

IMPACT

➤ Transition to a climate-neutral and resilient society and economy enabled through advanced climate science, pathways and responses to climate change (mitigation and adaptation) and behavioural transformations.



CL5 DESTINATION 1

1. Climate sciences and responses for the transformation towards climate neutrality

Destination 1 helps identify effective and efficient responses to climate change

- concentrates on activities related to climate science and modelling

Destination 1: Climate sciences and responses for the transformation towards climate neutrality

Enabling the transition to a climate-neutral and resilient society and economy through:

- improving the knowledge of the Earth system
- ability to predict and project its changes under different natural and socio-economic drivers
- **Expected overall impact is to contribute to the “*Transition to a climate-neutral and resilient society and economy*” enabled through**
 - *advanced climate science, pathways and responses to climate change (mitigation and adaptation) and behavioural transformations*

Actions will contribute to

- *Advancing knowledge and providing solutions in following areas: Earth system science; pathways to climate neutrality; climate change adaptation including climate services; social science for climate action; and better understanding of climate-ecosystems interactions.*
- *key international assessments concerning climate change and environment*
- *strengthening the European Research area on climate change*
- *Increasing the transparency, robustness, trustworthiness and practical usability of the knowledge base on climate change for use by policy makers, practitioners, other stakeholders and citizens.*

CL5 Destination 1 commonalities (check call text)

- 'do no significant harm' principle
- Coordination and synergies between activities supported under Destination 1, as well as in other Destinations and Clusters, and in particular complementarities with Cluster 4 and Cluster 6 should be taken into account -> plan adequate resources for the work
- Collaboration with other projects, synergies with other funding programmes etc.
- Beneficiaries encouraged to take advantage of relevant national or European research infrastructures
- International cooperation encouraged
- Collaboration between the scientific community and policy- and decision-makers
- Contribution of SSH disciplines/involvement of SSH expertise – nearly all topics
- Social innovation
- Building on existing knowledge, going beyond state-of-the-art

International cooperation

collaboration

SSH

Coordination and synergies with other projects & programs

existing research infrastructures

Destination 1: Climate sciences and responses for the transformation towards climate neutrality

Call CL5-2021-D1-01, opening 15.4.21 (tbc), closing 7.9.21 (tbc)

indicative budget 136 M€ for 9 topics, 7 RIA + 2CSA:

- 2021-D1-01-01: Improved understanding of greenhouse gas fluxes and radiative forcers, including carbon dioxide removal technologies (RIA) **24M€ (8M€/project)**
- 2021-D1-01-02: Modelling the role of the circular economy for climate change mitigation (RIA) **15M€ (5M€/project)**
- **2021-D1-01-03: Maximising the impact and synergy of European climate change research and innovation (CSA) 8 M€ (3-4 M€)**
- 2021-D1-01-04: Enhanced integrated assessment in pursuit of global climate goals (RIA) **15M€ (5M€/project)**
- 2021-D1-01-05: Better understanding of the interactions between climate change impacts and risks, mitigation and adaptation options (RIA) **20M€ (6-7M€/project)**
- **2021-D1-01-06: Supporting and standardising climate services (CSA) 10M€ (10M€/project)**
- 2021-D1-01-07: Improved economic methods for decision-making on climate and environmental policies (RIA) **6M€ (3M€/project)**
- 2021-D1-01-08: Restoration of natural wetlands, peatlands and floodplains as a strategy for fast mitigation benefits; pathways, trade-offs and co-benefits (RIA) **20M€ (6-7M€/project)**
- 2021-D1-01-09 : The contribution of forest management to climate action: pathways, trade-offs and co-benefits (RIA) **18M€ (6M€/project)**

D2

Destinaatio 2 Akut ja läpimurtoteknologiat

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HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

DESTINATION 2: Cross-sectoral solutions for the climate transition

Call CL5-2021-D2-01, opening 15.4.21, closing 19.10.21, indicative budget 231 M€ for 16 topics, here the 11 RIA's:

- CL5-2021-D2-01-01: Sustainable processing, refining and recycling of raw materials [21 M€]
- CL5-2021-D2-01-02: Advanced high-performance Generation 3b (high capacity / high voltage) Li-ion batteries supporting electro mobility and other applications [24 M€]
- CL5-2021-D2-01-03: Advanced high-performance Generation 4a, 4b (solid-state) Li-ion batteries supporting electro mobility and other applications
- CL5-2021-D2-01-04: Environmentally sustainable processing techniques applied to large scale electrode and cell component manufacturing for Li ion batteries [20 M€]
- CL5-2021-D2-01-05: Manufacturing technology development for solid-state batteries (SSB, Generations 4a - 4b batteries) [26 M€]
- CL5-2021-D2-01-06: Sustainable, safe and cost-efficient sorting, dismantling and second use before recycling processes [30 M€]
- CL5-2021-D2-01-08: Emerging technologies for a climate neutral Europe [20 M€]
- CL5-2021-D2-01-09: Methane cracking to usable hydrogen and carbon
- CL5-2021-D2-01-10: Technologies for non-CO₂ greenhouse gases removal
- CL5-2021-D2-01-11: Direct atmospheric carbon capture and conversion
- CL5-2021-D2-01-12: Fostering a just transition in Europe (*Citizens and stakeholder engagement*)

Batteries
(indicated with green text)

Break-through

Batteries European Partnership

- While R&I has to be conducted on all parts of the value chain, advanced materials development and battery cell design & manufacturing are seen as the key activities for which a well-structured coordination will allow Europe to develop the most differentiating technologies



- The Partnership should therefore allocate a **substantial part of its resources** on these segments of the value chain, along with circular economy aspects

Towards a competitive European industrial battery value chain for stationary applications and e-mobility – Objectives:

- Provide the European Industry with differentiating technologies, supporting the development of an innovative, competitive and sustainable battery manufacturing industry in Europe
- Develop sustainable and affordable battery solutions for clean mobility
- Enable a cost-effective integration of renewable energy sources in the power grid

Batteries European Partnership Association (BEPA) – why join the partnership:

- to provide concrete inputs to the Horizon Europe Work Programmes, and as part of the elaboration process, to get an early understanding of the R&I topics that will be proposed;
- to network with the most high-quality entities of the European battery sector;
- to participate in the association's governance, also in the design of the association's scope of actions (e.g. match-making activities, support to specific research fields, coordination with EU/national initiatives, etc.)

D3

Destinaatio 3

Energiantuotanto:

Uusiutuva energia, energiajärjestelmät ja verkko, CCUS

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HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

Energy in Horizon Europe

Destination 3 Sustainable, secure and competitive energy supply

- Global leadership in renewable energy
- Energy systems, grids and storage
- Carbon capture, utilisation and storage CCUS

Expected impact: More efficient, clean, sustainable, secure and competitive energy supply through new solutions for smart grids and energy systems based on more performant renewable energy solutions.

Destination 4 Efficient, sustainable and inclusive energy use

- Highly energy-efficient and climate-neutral EU building stock
- Industrial facilities in energy transition

Aim: Technological and socio-economic breakthroughs for the building stock by 2050
Aim: Increased energy-efficiency in industry and reducing GHG and air pollutant emissions

Hydrogen and fuel cells → Clean Hydrogen Partnership (2022->)

Clean Energy Transition Co-funded Partnership (separate calls)

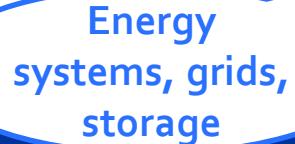
- Coordinates funding from at least 25 national/regional energy R&I programs (cf. SET-PLAN)

DESTINATION 3: Sustainable, secure and competitive energy supply



Call CL5-2021-D3-01, opening 15.4.21, closing 26.8.21, indicative budget 304 M€ for 19 topics, here 3 RIA's and 7 IA's:

- CL5-2021-D3-01-01: Demonstration of wave energy devices to increase experience in real sea condition [IA, 15 M€]
- CL5-2021-D3-01-04: Novel tandem, high efficiency Photovoltaic technologies targeting low cost production with earth abundant materials [RIA, 20 M€]
- CL5-2021-D3-01-05: Energy Sector Integration: Integrating and combining energy systems to a cost-optimised and flexible energy system of systems [IA, 30 M€]
- CL5-2021-D3-01-06: Increasing energy system flexibility based on sector-integration services to consumers (that benefits system management by DSOs and TSOs) [IA, 25 M€]
- CL5-2021-D3-01-07: Reliability and resilience of the grid: Measures for cybersecurity, vulnerabilities, failures, risks and privacy [IA, 15 M€]
- CL5-2021-D3-01-08: Electricity system reliability and resilience by design: High-Voltage, Direct Current (HVDC)-based systems and solutions [RIA, 15 M€]
- CL5-2021-D3-01-09: Demonstration of super-conducting systems and elpipes [IA, 15 M€]
- CL5-2021-D3-01-10: Demonstration of advanced Power Electronics for application in the energy sector [IA, 10 M€]
- CL5-2021-D3-01-12: Establish the grounds for a common European energy data space [IA, 32 M€]
- CL5-2021-D3-01-16: Cost reduction of CO₂ capture (new or improved technologies) [RIA, 30 M€] (CCUS)



DESTINATION 3: Sustainable energy supply

Call CL5-2021-D3-02, opening 2.9.21, closing 5.1.22, indicative budget 280 M€ for 16 topics all for renewable energy, 12 RIA's and 4 IA's:

- CL5-2021-D3-02-01: AU-EU Water Energy Food Nexus
- CL5-2021-D3-02-02: Next generation of renewable energy technologies [RIA, 33 M€]
- CL5-2021-D3-02-03: Hybrid catalytic conversion of renewable energy to carbon-neutral fuels [RIA, 10 M€]
- CL5-2021-D3-02-04: Physics and aerodynamics of atmospheric flow of wind for power production [RIA, 18 M€]
- CL5-2021-D3-02-05: Wind energy in the natural and social environment [RIA, 10 M€]
- CL5-2021-D3-02-06: Novel approaches to concentrated solar power (CSP) [RIA, 9 M€]
- CL5-2021-D3-02-07: Stable high performance Perovskite Photovoltaics [RIA, 15 M€]
- CL5-2021-D3-02-08: Cost-effective micro-CHP and hybrid heating systems [RIA, 10 M€]
- CL5-2021-D3-02-09: Carbon-negative sustainable biofuel production [RIA, 15 M€]
- CL5-2021-D3-02-10: Innovative foundations, floating substructures and connection systems for floating PV and ocean energy devices [RIA, 10 M€]
- CL5-2021-D3-02-11: Development of hydropower equipment for hidden hydropower [RIA, 10 M€]
- CL5-2021-D3-02-12: Innovation on floating wind energy deployment optimized for deep waters and different sea basins (Mediterranean Sea, Black Sea, Baltic Sea, North-east Atlantic Ocean) [IA, 50 M€]
- CL5-2021-D3-02-13: Demonstration pilot lines for alternative and innovative PV technologies (Novel c-Si tandem, thin film tandem, bifacial, CPV, etc.) [IA, 45 M€]
- CL5-2021-D3-02-14: Demonstration of large-scale CHP technologies for a shift to the use of biogenic residues and wastes [IA, 10 M€]
- CL5-2021-D3-02-15: Solutions for more sustainable geothermal energy [RIA, 10 M€]
- CL5-2021-D3-02-16: Innovative biomethane production as an energy carrier and a fuel [IA, 20 M€]

All renewables

D4

Destinaatio 4 (2021)

Tehokas, kestävä ja monipuolinen energian käyttö

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HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

Cluster 5: Climate, Energy and Mobility ~15.1 B€

1. Climate sciences and responses for the transformation towards climate neutrality

2. Cross-sectoral solutions for the climate transition

3. Sustainable, secure and competitive energy supply

4. Efficient, sustainable and inclusive energy use

5. Clean and competitive solutions for all transport modes

6. Safe, Resilient Transport and Smart Mobility services for passengers and goods

Destination 4 – Efficient, sustainable and inclusive energy use

- ✓ Making Europe the first **digitally led circular, climate-neutral and sustainable economy** through the transformation of its mobility, energy, construction and production systems.
- ✓ Promoting an open strategic autonomy by leading the development of **key digital and enabling technologies, sectors and value chains** to accelerate and steer the digital and green transitions through human-centred technologies and innovations.
- Technological and socio-economic breakthroughs for achieving climate neutrality and the transition to **zero pollution of the building stock by 2050**, based on inclusive and people-centric R&I (more detailed information below).
- Increased energy efficiency in industry and reducing industry's Greenhouse Gas (GHG) and air pollutant emissions through recovery, upgrade and/or conversion of industrial excess (waste) heat and through electrification of heat generation (more information below).

#EnergyEfficiency #ClimateNeutrality #SustainableLiving #NewDesign #Arts
#Thermal_Energy_in_Industry

Highly energy-efficient and climate neutral EU building stock

- HORIZON-CL5-2021-D4-01-01: Advanced energy performance assessment and certification (**IA: 2 x 3 – 5 M€ | TRL: -> 6 – 7**)
- HORIZON-CL5-2021-D4-01-02: Industrialisation of deep renovation workflows for energy-efficient buildings (**IA: 2 x 5 – 8 M€ | TRL: -> 8**)
- HORIZON-CL5-2021-D4-01-03: Advanced data-driven monitoring of building stock energy performance (**IA: 2 x 3 – 5 M€ | TRL: -> 8**)

Industrial facilities in the energy transition

- HORIZON-CL5-2021-D4-01-04: Full-scale demonstration of heat upgrade technologies with supply temperature in the range 90 - 160°C (**IA: 2 x 8 M€ | TRL: -> 7 – 8**)
- HORIZON-CL5-2021-D4-01-05: Industrial excess (waste) Heat-to-Power conversion based on organic Rankine cycles (**IA: 1 x 10 – 14 M€ | TRL: -> 6 – 7**)

Highly energy-efficient and climate neutral EU building stock

- HORIZON-CL5-2021-D4-02-01: Demonstrating integrated technology solutions for buildings with performance guarantees (Built4People, **IA: 2 x 5 – 7,5 M€ | TRL: -> 6 – 7**)
- HORIZON-CL5-2021-D4-02-02: Cost-effective, sustainable multi-functional and/or prefabricated holistic renovation packages, integrating RES and including re-used and recycled materials (Built4People, **IA: 2 x 9 – 11 M€ | TRL: -> 7**)
- HORIZON-CL5-2021-D4-02-03: Strengthening European coordination and exchange for innovation uptake towards sustainability, quality, circularity and social inclusion in the built environment as a contribution to the new European Bauhaus (Built4People, **CSA: 1 x 1 M€**)

HORIZON-CL5-2021-D4-02-01: Demonstrating integrated technology solutions for buildings with performance guarantees (Built4People)

Example of topic contents

Innovation Action (60 %) | IA: 2 x 5 – 7,5 M€ | TRL: -> 6 – 7 | Opening 2 Sep 2021 | DL 25 Jan 2022

Expected outcome: Demonstrated viability of, and proven integrated technology solutions for, performance guarantees and performance-based contracts to increase buildings energy performance.

Enhanced consumer trust in guarantees of performance and related contracts. Increased number of market actors, especially SMEs. Enhanced awareness of end users.

Scope: Design and demonstrate innovative integrated technology solutions based on state-of-the-art components (envelope, heating, ventilation and air-conditioning, cooling, automation and control, renewable energy, etc.).

Investigate the viability of performance-based business models. Develop business models that suit new industrialised design and production methods, and include enhanced energy and resource. Ensure that those business models make use of digital tools.

Co-Programmed European Partnership Built4People (B4P)

The B4P partnership's common vision is high quality, low carbon and **highly energy and resource efficient built environment** driving the societal and economic transition towards sustainability



A multi-annual **Strategic Research and Innovation Agenda (SRIA)** has been provided as a preliminary basis for the development of the co-operation between the EC and the Construction sector and for defining the annual priorities in line with the **Strategic Plan for Horizon Europe**

Specific
Objective

& 54 anticipated outputs...

HE Partnership Built4People (B4P)

Why to participate

- **follow-up** of EU research and innovation
- to take part in **agenda-setting and thematic priorities**
- **networking** for consortium building and entering value chains
- A way for starting **internationalization** and have access to new domestic and international partners
- Support for **risk-sharing**

How to participate

- Participate in the partnerships calls
- Follow info-sessions and open consultancies,
- Use the Finnish involved organizations as ambassadors
- Become a Partner in the PPP associations



D5

Destinaatio 5 Puhdas liikenne: maa/meri/ilma

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HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

DESTINATION 5: Puhtaat ja kilpailukykyiset ratkaisut kaikkiin liikennemuotoihin

Päästötön tieliikenne – kuuluu **2ZERO-kumppanuusohjelmaan**

- Zero-emission road transport

Ilmailiikenne – Aviation

Vesiliikenne – kuuluu **ZEWWT-kumppanuusohjelmaan**

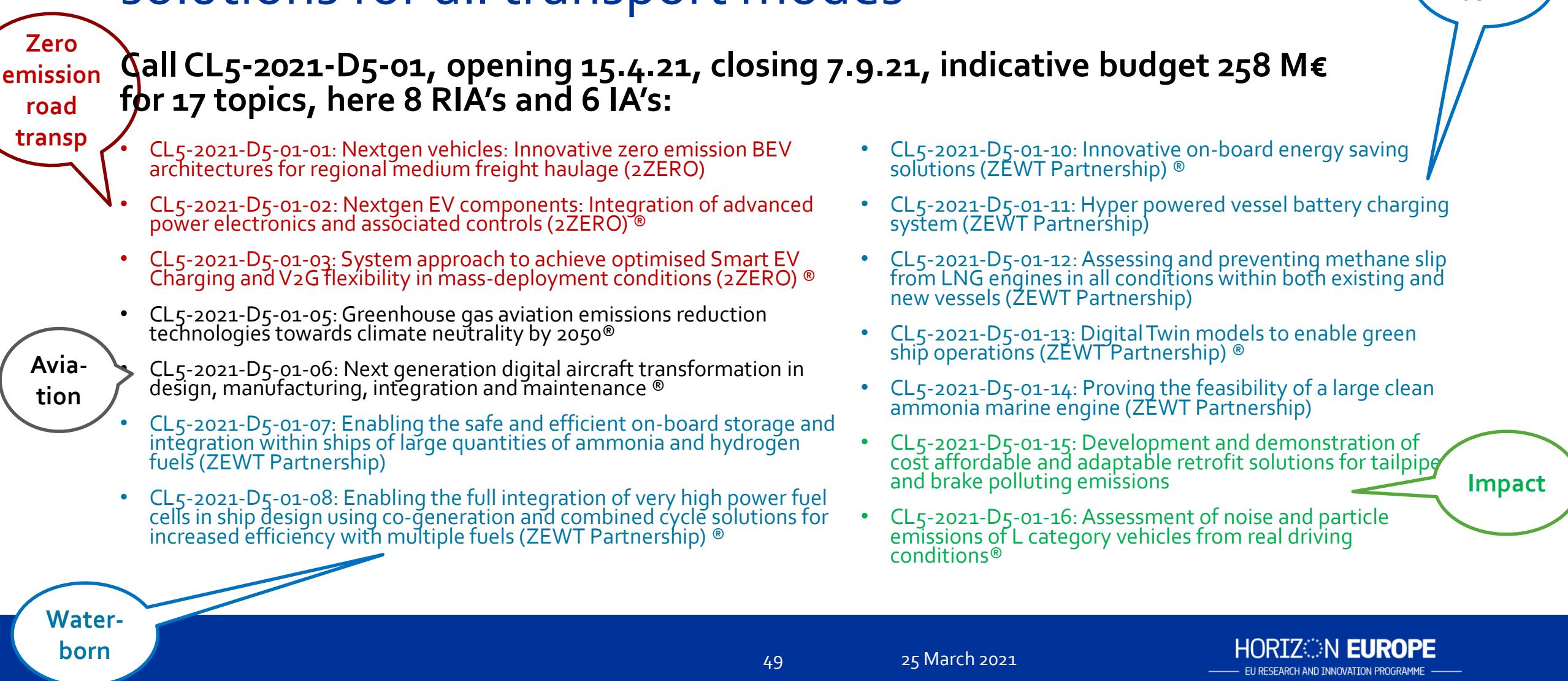
- Zero-emission waterborne transport
- Enabling climate neutral, clean, smart, and competitive waterborne transport

Impact of transport on environment and human health

- Reduction of polluting emissions, noise and overall environmental impact of transport

Rautatieliikenteen kumppanuusohjelma **Europe's rail** oma työohjelma 2021

DESTINATION 5: Clean and competitive solutions for all transport modes



Towards Zero-emission Road Transport (2ZERO)

Co-programmed Partnership, successor of Green Vehicles Initiative cPPP

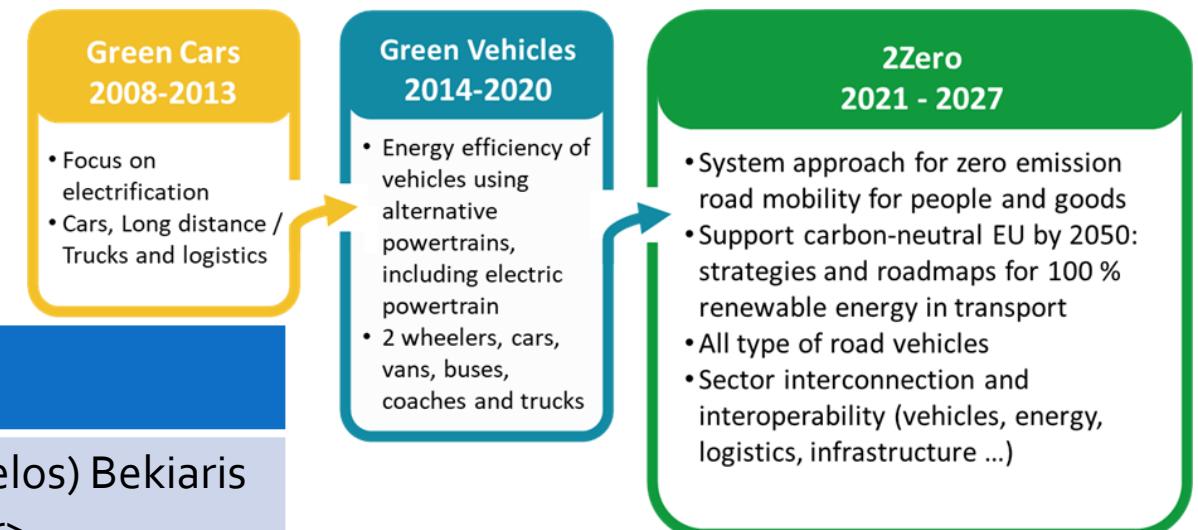
OBJECTIVES

- Develop **zero-emission, affordable user centric solutions** (technologies and services) for road-based mobility
- Develop technologies/solutions to **reduce all emission sources** (e.g. tires and brakes), **noise and improve air quality**
- Develop and demonstrate affordable, user-friendly **charging infrastructure technology and V2G interaction**
- Develop **innovative use cases** for integration of **zero-emission vehicles** and infrastructure
- Support the development of **life-cycle tools and skills** and deployment of innovative concepts

EXPECTED IMPACTS

- Support Europe as carbon-neutral continent by 2050
- Technology leadership supporting economic growth and job creation all over Europe
- Wide deployment of zero-emission, affordable user centric solutions
- CO₂ emission reduction and air quality improvements

Kumpp.ohjelma	Valmisteleva organis.	Yhteyshenkilö
2ZERO	EGVI Eur.Green Vehicles Initiative	Evangelos (Angelos) Bekiaris abek@certh.gr



Zero-Emission Waterborne Transport

Co-programmed Partnership

Calls

Research call topics are announced annually in the Cluster 5 Work Programmes. The topics are based upon expert input and public consultations undertaken by the Waterborne TP.

- In response to the call topics interested organisations form consortia and submit proposals which are then independently evaluated. Following evaluation, a project is assigned a percentage of funding from the European Union with the rest of the funding and resources coming from the members of the project consortium.

Would your organisation be interested to be part of the transition towards zero-emission waterborne transport, or you would have questions, please contact the Waterborne TP by sending an e-mail to: info@waterborne.eu

- <https://www.waterborne.eu/partnership>

Task: to provide and demonstrate zero-emission solutions for all main ship types and services before 2030, which will enable zero-emission waterborne transport before 2050. Also:

- Develop and demonstrate deployable technological solutions which will be applicable for the decarbonisation and the elimination of other harmful emissions of main ship types and services;
- Facilitate the implementation of economically viable European new technologies and concepts regarding zero-emission waterborne transport, to strengthen the competitiveness of European industries in growing green ship technology markets;
- Facilitate the development and implementation of regulations and policies at national and international level, including the development of standards to enable the implementation of technological solutions for zero-emission waterborne transport by 2030 at the latest;
- Facilitate the uptake of innovative zero-emission waterborne transport technologies and solutions within the European waterborne sector.

Objective is to deliver the Single European Railway Area bringing to the market an integrated, sustainable and digital rail system of systems

Kumppanuusohjelman avauksena *Transforming projects –pilotit 2021->*

R&D&I for delivering New rail Services integrated in a mobility and logistic ecosystem

- TP n°5: Smart Integration for door-to-door Mobility
- TP n°8: Rail as the backbone of a green freight logistic chain

R&D&I for delivering Optimised rail and urban Operations

- TP n°1: Connected and open rail framework for the European mobility
- TP n°9: Network Management Planning and Control
- TP n°7: Environmentally Friendly and Attractive Sustainable Mobility

R&D&I for delivering Innovative Assets leveraging technological breakthroughs

- TP n°2: Assets for Automated and/or Autonomous and/or remotely piloted Operations
- TP n°4: Smart Asset Management and maintenance of the future
- TP n°6: Non-traditional and Emerging Transport Models and Systems
- TP n°3: Railways Digital Twin, Simulation & Virtualisation

EU:n suuntaviivat liikkumisen digitalisaatiolle (M.Rautavirta, LVM 2021)

EU:n tavoitteita vuoteen 2050:

- Raideliikenteen osuus tavaraliikenteestä tuplattava
- Nopeat junayhteyden kolminkertaistettava
- 75 % maantieliikenteestä joko kiskoilla tai sisävesillä
- Automaation mahdollistamiseksi käytettävien teknologioiden päivitys: 5G, satelliittidata, yhtenäinen järjestelmääkkitehtuuri

Tavoite: *An enabling environment for such game-changing mobility technologies is key, so that the EU can become a prime deployment destination for innovators, start-ups and technology developers.*

D6

Destinaatio 6

Älykäs turvallinen liikenne: connected automated mobility, multimodal freight, safety - resilience

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HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME

Destinaatio 6: Turvallinen ja luotettava liikenne sekä älykkään liikkuvuuden järjestelmät matkustajille ja rahoille

Älyliikenne – kuuluu CCAM-kumppanuusohjelmaan

- Connected, cooperative, automated mobility
- User-centric technologies and services, including digital technologies and advanced satellite navigation services

Smart mobility services for passengers and goods

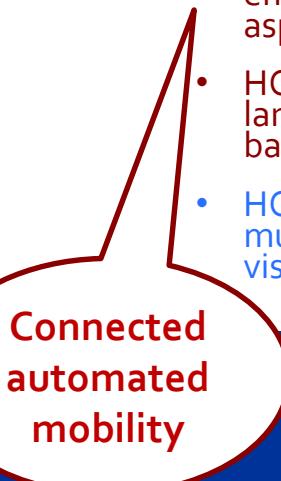
- Multimodal freight
- Safe, seamless, smart, inclusive, resilient, climate neutral and sustainable mobility systems for people and goods

Safety and resilience – per mode

DESTINATION 6: Safe, Resilient Transport and Smart Mobility services for passengers and goods

Call CL5-2021-D6-01, opening 15.4.21, closing 19.10.21, indicative budget 167 M€ for 13 topics, here 7 RIA's and 6 IA's:

- HORIZON-CL5-2021-D6-01-01: More powerful and reliable on-board perception and decision-making technologies addressing complex environmental conditions (CCAM Partnership)
- HORIZON-CL5-2021-D6-01-02: Common approaches for the safety validation of CCAM systems (CCAM Partnership) ®
- HORIZON-CL5-2021-D6-01-03: Physical and Digital Infrastructure (PDI), connectivity and cooperation enabling and supporting CCAM (CCAM Partnership)
- HORIZON-CL5-2021-D6-01-04: Cyber secure and resilient CCAM ®
- HORIZON-CL5-2021-D6-01-05: Analysis of socio-economic and environmental impacts and assessment of societal, citizen and user aspects for needs based CCAM solutions (CCAM Partnersh) ®
- HORIZON-CL5-2021-D6-01-06: Framework for better coordination of large-scale demonstration pilots in Europe and EU-wide knowledge base (CCAM Partnership) ®
- HORIZON-CL5-2021-D6-01-07: More efficient and effective multimodal freight transport nodes to increase flexibility, service visibility and reduce the average cost of freight transport
- HORIZON-CL5-2021-D6-01-08: New delivery methods and business/operating models to green the last mile and optimise road transport
- HORIZON-CL5-2021-D6-01-09: Climate resilient and environmentally sustainable transport infrastructure, with a focus on inland waterways
- HORIZON-CL5-2021-D6-01-10: Testing safe lightweight vehicles and improved safe human-technology interaction in the future traffic system®
- HORIZON-CL5-2021-D6-01-11: Radical improvement of road safety in low and medium income countries in Africa®
- HORIZON-CL5-2021-D6-01-12: Controlling infection on large passenger ships ®
- HORIZON-CL5-2021-D6-01-13: Safe automation and human factors in aviation – intelligent integration and assistance



Connected
automated
mobility

Multi-modal



Safety,
resilience

Connected, cooperative, automated mobility (CCAM)

Host: ERTRAC

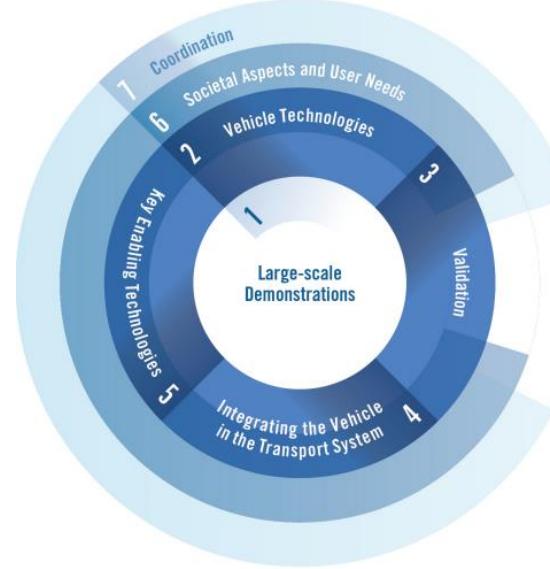
Contact: xavier.aertsens@ertrac.org

- Co-programmed partnership
- The network of stakeholders interested to take part: 400 contacts already
- a new CCAM Association is created – joining the Association is a proof of commitment
- Many membership categories, fee between 1000 – 5000 €/a

Finland: Traficom

Contact: eetu.pilli-sihvola@traficom.fi

- Call topics for 2021–22 in CL5 WP



D6 Safe, resilient transport and smart mobility services

Call	Deadline	Area	Topics
21-D6-01	19.10.21	CCAM	6
22-D6-01	19.1.22	CCAM	5

Partnership Programme planned in seven contents clusters

1. Large Demonstrations: Pilots, FOTs, Living Labs

Kiitos mielenkiinnosta!

Ota yhteyttä – NCP auttaa!

EUTI (EU:n tutkimus ja innovaatio-ohjelmien asiantuntija ja kansallinen yhteystoimisto)

[KOMITEAJÄSENET & NCP-YHTEYSHENKILÖT](#)
- maksutonta, kaikille tarjolla, julkista neuvontaa

TIETOA,
NEUVONTAA
OPASTUSTA

TYÖOHJELMAN
LUKEMISTA
KANSSASI

KOULUTUSTA
TAPAHTUMIA

OHJAAMISTA
OIKEALLE
"LUUKULLE"

HAKEMUSTEN
KOMMENTOINTIA

TILASTODATAA &
SEURANTATIETOJA

HORIZON EUROPE

EU RESEARCH AND INNOVATION PROGRAMME