



Welcome to the Webinar!
We will start soon....



Horizon Europe – Clean and competitive solutions for all transport modes

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Disclaimer

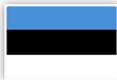
The participation of Israeli entities, as associated country, in Horizon Europe projects, is subject to the signing of the 'Association Agreement' to the programme between Israel and the EU, before the first project's Grant Agreement (GA) is signed.

The presentation of draft topics and the feedback provided shall in under no circumstances bind the European Commission in the final formulation of topics for the call.

The binding call text will be published following the formal decision by the European Commission on the Funding and tender opportunities portal

Participating Countries

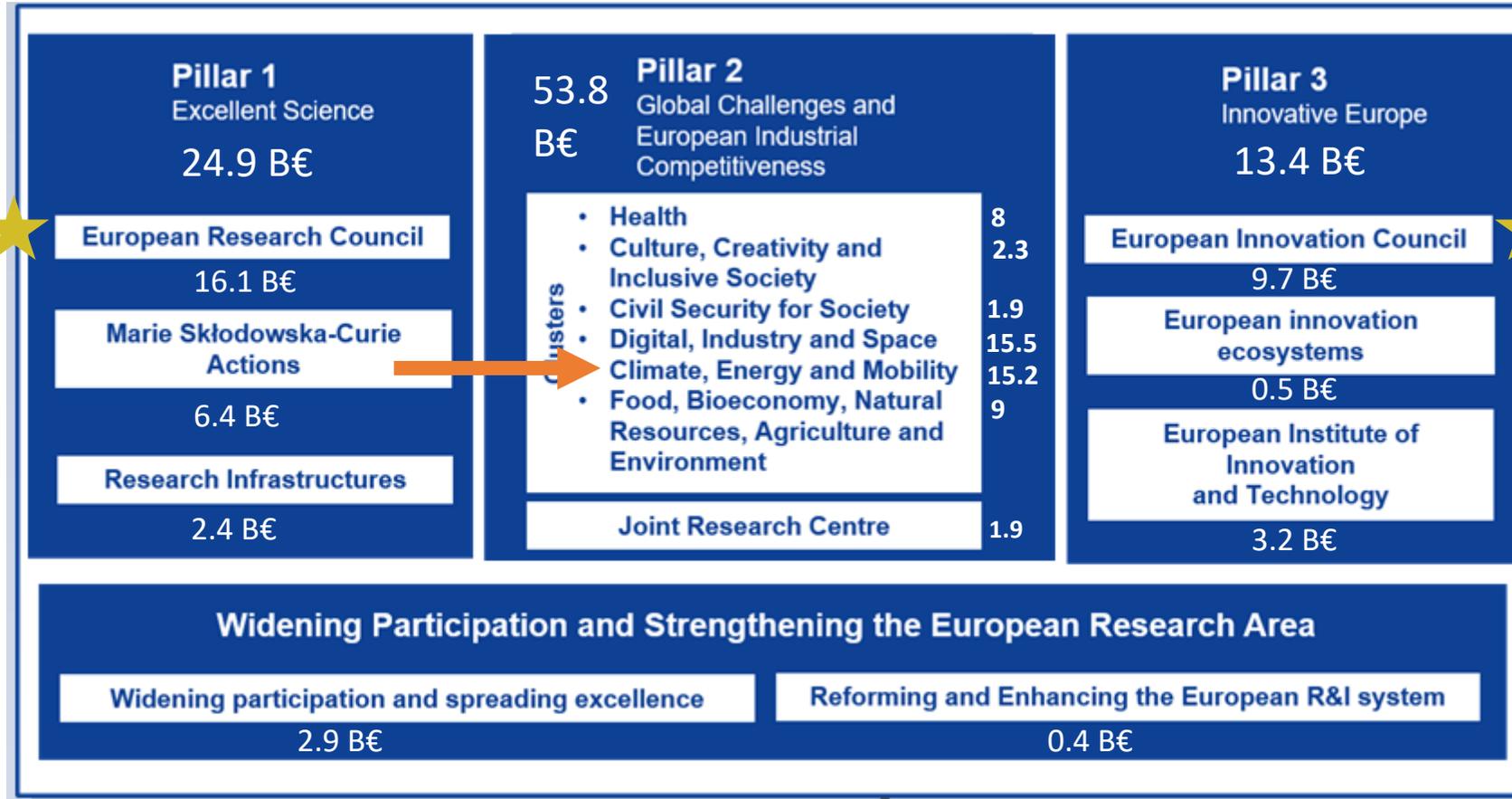
27 Member States (MS)

 Austria (AT)	 France (FR)	 Malta (MT)
 Belgium (BE)	 Germany (DE)	 Netherlands (NL)
 Bulgaria (BG)	 Greece (GR/EL)	 Poland (PL)
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 Cyprus (CY)	 Ireland (IE)	 Romania (RO)
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 Denmark (DK)	 Latvia (LV)	 Slovenia (SI)
 Estonia (EE)	 Lithuania (LT)	 Spain (ES)
 Finland (FI)	 Luxembourg (LU)	 Sweden (SE)

17 Associated Countries (AC)

 Albania (AL)	 Montenegro (ME)
 Armenia (AM)	 Norway (NO)
 Bosnia and Herzegovina (BA)	 Serbia (RS)
 Faroe Islands (FO)	 Switzerland (CH)
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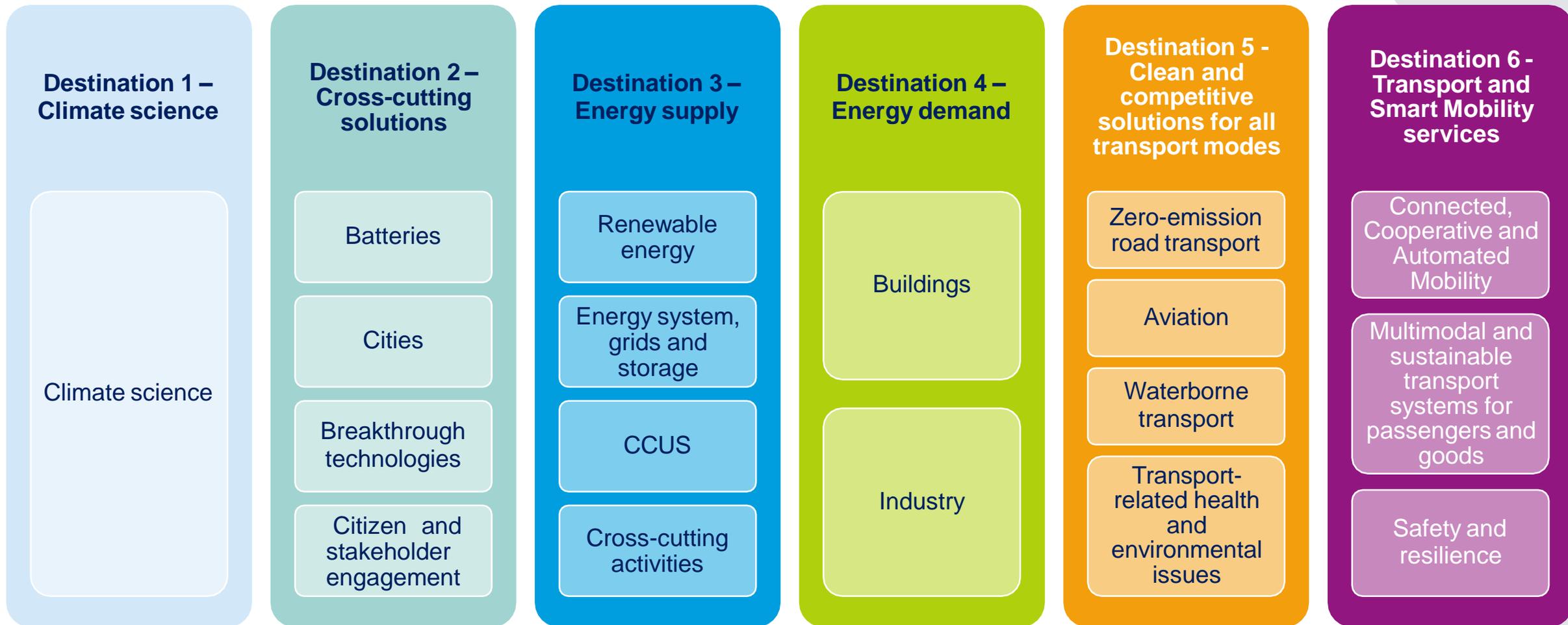
Horizon Europe (2021-2027)



Budget of € 95.517 billion for Horizon Europe

Cluster 5: Climate, Energy and Mobility

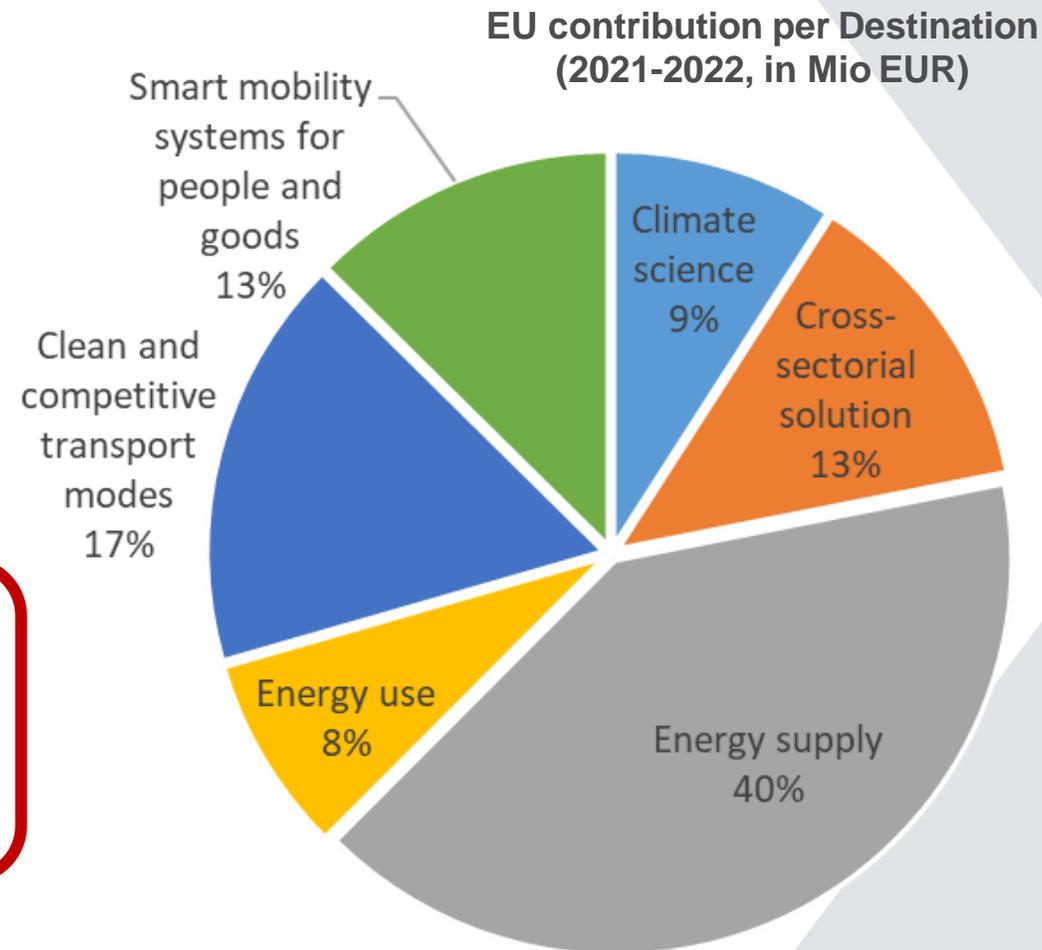
Work programme - overview



Cluster 5: Climate, Energy and Mobility

Budget

	Budget (Mio €)	Share of total	Number of topics	Share of total
Climate science	274	9%	17	9%
Cross-sectorial solution	387.5	13%	25	13%
Energy supply	1226.3	40%	67	36%
Energy use	244	8%	18	10%
Clean and competitive transport modes	511	17%	31	17%
Smart mobility systems for people and goods	380	13%	28	15%
TOTAL	3022.8		186	



Main Types of Action

Action	Funding*	Technology Readiness Level (TRL)	Main Characteristics
RIA – Research & Innovation Action	100% + 25%	Low TRL (4-6)	Basic and applied research , technology development and integration, testing and validation on small-scale prototype in laboratory or simulated environment
IA – Innovation Action	70% + 25%	High TRL (6-8)	Prototyping , testing, demonstrating, piloting, large-scale product validation and market replication
CSA - Coordination & Support Action	100% + 25%		Networking , coordination or support services , policy dialogues and mutual learning exercises and studies

* Non profit – always 100%

Cluster 5 Partnerships

Institutional Partnerships

- Transforming Europe's rail system
- Integrated Air Traffic Management
- Clean Aviation
- Clean Hydrogen

Co-funded Partnerships

- Driving urban transitions to a sustainable future (DUT)
- Clean Energy Transition

Co-programmed Partnerships

- Built4People | People-centric sustainable built environment
- Towards zero-emission road transport (2ZERO)
- Batteries: Towards a competitive European industrial battery value chain for stationary applications and e-mobility
- Zero-emission waterborne transport
- Connected, Cooperative and Automated Mobility (CCAM)

Objectives

The main objectives of this cluster are **to fight climate change, improve the competitiveness of the energy and transport industry** as well as the **quality of the services** that these sectors bring to society.

The **expected impact**, in line with the Strategic Plan, is to contribute *“Towards climate-neutral and environmental friendly mobility through clean solutions across all transport modes while increasing global competitiveness of the EU transport sector”*,

Destination 5 – Clean and competitive solutions for all transport modes



- **Zero-emission road transport:** Transforming road transport to **zero-emission mobility** through a world-class European research and innovation and industrial system, ensuring **that Europe remains world leader** in innovation, production and services in relation to road transport.
- **Aviation:** Accelerating the **reduction of all aviation impacts and emissions** (CO2 and non-CO2, including manufacturing and end-of-life, noise), developing aircraft technologies for deep reduction of greenhouse gas emissions, and **maintaining European aero-industry's global leadership** position.

Destination 5 – Clean and competitive solutions for all transport modes

Destination 5 -
Clean and
competitive
solutions for all
transport modes

Zero-emission
road transport

Aviation

Waterborne
transport

Transport-
related health
and
environmental
issues

- **Waterborne transport:** Accelerate the development and prepare the deployment of **climate neutral and clean solutions** in the shipping sector, **reduce its environmental impact** (on biodiversity, noise, pollution and waste management), improve its **system efficiency**, leverage digital and EU satellite-navigation solutions and contribute to the **competitiveness** of the European waterborne sector.
- **Transport - Health and environment:** Devising more effective ways for **reducing emissions and their impacts** through improved scientific knowledge.



Call for proposal

Call	Opening	Deadline
2021	15 Apr 2021	7 Sep 2021
2022	2 Dec 2021	26 Apr 2022

Zero-emission road transport

HORIZON-CL5-2021-D5-01-01: Nextgen vehicles: Innovative zero emission BEV architectures for regional medium freight haulage

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
7-8	45	3	IA*	7.9.21

Scope: Validation of full electric N2 and/or N3-category vehicle(s), specific regional, suburban and urban freight transport applications seamlessly **integrated into fleets**.

- Demonstrating the capabilities of the proposed architecture in terms of **range, payload, charging requirements, access to connected data etc.**
- Demonstration of high efficiency **powertrains capable** between recharging events.
- Demonstrate at least 200 km average daily operation in **real conditions** over a period of at least 6 months, according to different mission profiles and requirements including **end users from across Europe**.



Zero-emission road transport

HORIZON-CL5-2021-D5-01-01: Nextgen vehicles: Innovative zero emission BEV architectures for regional medium freight haulage

- Define and develop **charging infrastructure solution(s)** and associated strategies.
- Assess the capabilities under real operational conditions and **propose strategies to overcome payload and range limitations**, and innovation **big data acquisition for analyzing** the missions in terms of payload and daily running for maximizing vehicle productivity
- Developing and validating **tools for zero tailpipe emission vehicles integration in fleets** for efficient assignment of tasks.

Expected Outcome:

- Provide innovative, **zero tailpipe emissions vehicles architectures for regional medium freight transport** and distribution full electric N2 and/or N3 category vehicles with **prototype(s) fully validated for a zero-emission driving.**
- Provide fleet managers **tools supporting the integration of zero tailpipe emissions vehicles into fleets and** facilitating the assignment of tasks and routes.

Zero-emission road transport

HORIZON-CL5-2021-D5-01-02: Nextgen EV components: Integration of advanced power electronics and associated controls

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
5-6	20	4	RIA	7.9.21

Scope:

- Development of **power electronics** reducing size and weight for the electric drive for a BEV.
- Circuit concepts and control: **Topologies adapted to advanced WBG** semiconductors and new materials. **Control strategies** and intelligent **monitoring capabilities**, suitable for very high-frequency operation.
- **Interconnected technologies**: robust assembly and materials, better suited for integration and new power semiconductors, alongside the capability for higher temperatures and currents.
- **Joining and connecting technologies**: Power output stages with low impedance connection and increased robustness against temperature cycling, as well as advanced interfaces for modular building blocks.
- Thermal management, simulation/prediction



Zero-emission road transport

HORIZON-CL5-2021-D5-01-02: Nextgen EV components: Integration of advanced power electronics and associated controls

Expected outcome:

- Demonstrate a **cost reduction of power electronic modules and inverters**, to increase the overall affordability of EVs in mass production.
- Significant advancements in **efficiency and thermal performance**.
- Facilitating the **integration of power electronics in batteries and electric motors/axles**.
- Increased reliability and availability of powertrain by **intelligent control and diagnostics techniques**, predictive maintenance of machine and inverter.



Zero-emission road transport

HORIZON-CL5-2021-D5-01-03: System approach to achieve optimised Smart EV Charging and V2G flexibility in mass-deployment conditions

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
5-7	25	3	RIA	7.9.21

Scope:

- Improving **user experience** and **drivers' needs** when charging Evs, under **different scenarios**.
- Analyze, develop and demonstrate power charging system appropriate for mass deployment.
- Analyzing and defining pros and cons of the concept of performing fast charging as an alternative to a pervasive low power charging network.
- Clear framework for use of the **personal data generated**, in line with the General Data Protection Regulation.



Zero-emission road transport

HORIZON-CL5-2021-D5-01-03: System approach to achieve optimised Smart EV Charging and V2G flexibility in mass-deployment conditions

Scope:

- Quantitative parametric models for assessing **the impact of massive EV penetration on the electricity system** (hourly/weekly load, for energy adequacy, grid congestions).
- Quantified **the impact of the different bidirectional charging** profiles on the life of the EV battery and power electronics.
- Considering the **connectivity and interoperability between the vehicle and the different players in the EV charging ecosystem** (charging point operators, electromobility service providers, distribution system operators)
- **Assessing the collection, exchange and management of relevant data** for smart and bidirectional charging. Also assessing and developing **protocols for new/updated standards.**



Zero-emission road transport

HORIZON-CL5-2021-D5-01-03: System approach to achieve optimised Smart EV Charging and V2G flexibility in mass-deployment conditions

Expected outcome:

- Definition of the **optimal smart charging concepts** able to cope with several million of Electric Vehicles (EV) deployed in different environments.
- Development of **smart charging strategies and control mechanisms** that maximise the EV drivers' satisfaction and the efficiency of the whole energy system (renewable electricity energy sources).
- Innovative concepts and **technologies performances to create smart charging solutions**, co-optimising the needs of EV users, of the house/building and of the supplying grid.
- Understanding **the impact on the vehicle and on the charging infrastructure** of smart and bidirectional (V2G) charging approaches and technologies.



Zero-emission road transport

HORIZON-CL5-2021-D5-01-04: LCA and design for sustainable circularity - holistic approach for zero-emission mobility solutions and related battery value chain

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
-	4	1	CSA	7.9.21

Scope:

- Elaborate a consensus LCA approach specific for zero-emission solutions, with an emphasis on light-duty and heavy-duty ZEV and the related battery value chain.
- Evaluating existing LCA and S-LCA needs, methodologies, tools datasets and metrics, to identify and overcome knowledge gaps, to identify development needs in current methodologies and tools, as well as to identify the impact reduction potential for ZEV and batteries.
- Define access to the database.



Zero-emission road transport

Topic	Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
HORIZON-CL5-2022-D5-01-08: Modular multi-powertrain zero-emission systems for HDV (BEV and FCEV) for efficient and economic operation (2ZERO)	7-8	58	5	IA*	26.4.22
HORIZON-CL5-2022-D5-01-09: Nextgen EV components: High efficiency and low cost electric motors for circularity and low use of rare resources (2ZERO)	5-7	20	4	RIA	26.4.22
HORIZON-CL5-2022-D5-01-10: New generation of full electric urban and peri-urban Bus Rapid Transit systems to strengthen climate-friendly mass transport (2ZERO)	7-8	25	1	IA*	26.4.22
HORIZON-CL5-2022-D5-01-11: Stimulating Road Transport research and innovation dissemination and implementation in Europe and around the World	-	2	1	CSA	26.4.22

Aviation

➤ HORIZON-CL5-2021-D5-01-05: Greenhouse gas aviation emissions reduction technologies towards climate neutrality by 2050

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
2-4	25	6	RIA	7.9.21

Scope:

- New **low TRL technologies for reduced life-cycle GHG emissions** that will reach TRL4 by 2030, at the latest
- **Design of new configurations, electrified aircraft and engine architectures, electric systems, integrated metallic, composite and multifunctional aerostructures, advanced flow control and high-lift aerodynamics as well as advancements in flight control systems.**
- Synergies with European Partnership on **Clean Aviation (EPCA)** and Integrated **ATM** partnerships (IATM)
- Research for **understanding the non-CO2 climate impacts.**



Aviation

➤ HORIZON-CL5-2021-D5-01-05: Greenhouse gas aviation emissions reduction technologies towards climate neutrality by 2050

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
2-4	25	6	RIA	7.9.21

Expected Outcome:

- Deliver transformative technologies that will substantially **reduce non-CO2**.
- Deliver transformative **technologies for aircraft engines, systems and structures** that will maximise the **life cycle environmental impact reduction**.
- Explore **new modular aircraft and/or component configurations**, optimised for the lowest possible environmental impact and noise footprint at take-off and landing operations, allowing 24/7 operations.
- The selection of technologies should deliver intermediate benefits and bridge the aviation climate neutrality gap towards 2050.



Aviation

- HORIZON-CL5-2021-D5-01-06: Next generation digital aircraft transformation in design, manufacturing, integration and maintenance

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
2-4	29	5	RIA	7.9.21

Scope:

- Accelerate the **design and manufacturing processes** (including additive manufacturing).
- To cover all aspects of digital aircraft, **from design and manufacturing to operations and recycling**.
- Digital-physical aircrafts for education, research and development.
- **Digital factory** for all tiers and integrators and for all aircraft platform, from components to final assembly line (FAL).
- The topic is in-line with the European new industrial policy and will bring even closer together the European supply chain (including innovative SMEs and start-ups)



Aviation

- HORIZON-CL5-2021-D5-01-06: **Next generation digital aircraft transformation in design, manufacturing, integration and maintenance**

Expected Outcome:

- Deliver transformative **digital technologies allowing entry into service of future European aircrafts**, supporting technologies for future climate-neutral aircraft.
- Deliver new technologies and methodologies for validation and prediction of hardware and software reliability and impact on flight safety for commercial aviation.
- **Reduce the lifecycle greenhouse gas impact of aircraft materials.** Enable a clear path towards a fully circular aircraft.
- Deliver transformative digital and eco-efficient **manufacturing technologies.** Advance further composite manufacturing and maintenance-repair-overhaul (MRO) processes.



Aviation

Topic	Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
HORIZON-CL5-2022-D5-01-12: Towards a silent and ultra-low local air pollution aircraft	2-4	20	5	RIA	26.4.22
HORIZON-CL5-2022-D5-01-13: Digital aviation technologies for new aviation business models, services, emerging global threats and industrial competitiveness	2-4	20	5	RIA	26.4.22
HORIZON-CL5-2022-D5-01-14: European Aviation Research Policy in support to EU policies and initiatives	2-4	5	3	RIA	26.4.22

Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-07: Enabling the safe and efficient on-board storage and integration within ships of large quantities of ammonia and hydrogen fuels

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
6-7	20	2	IA	7.9.21

Scope:

- To develop large and very large **storage solutions for hydrogen and ammonia** on-board.
- Research and innovation with respect to the **efficient and safe on-board storage** and use under real shipping conditions (pressure, temperature, explosion risk and toxicity).
- Design, testing and overall assessment of on-board systems for these fuels, developing concepts and **testing them at lab** scale with **perspective of scaling up**.
- **Structural integration of fuel and energy systems on-board** (safety issues, standards development, storage volumes)
- Consider **bunkering situations** as part of the fuel handling on-board.



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-07: Enabling the safe and efficient on-board storage and integration within ships of large quantities of ammonia and hydrogen fuels

Expected Outcome:

- Demonstration of the feasibility to store and use **hydrogen-based fuels** in a realistic environment on-board.
- Demonstration of the use of these fuels in **high power applications** with long autonomy.
- Demonstration of the applicability, respect to short sea shipping, IWT vessels and passenger ships.
- Development of **technical rules**.



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-08: Enabling the full integration of very high power Fuel Cells (FC) in ship design using co-generation and combined cycle solutions for increased efficiency with multiple fuels

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
5	15	1	RIA	7.9.21

Scope:

- Prove the use of high-temperature FCs in a **co-generation and combined cycle mode**,
 - Either on a ship powered uniquely by FCs.
 - Or on-board a large ship with high power demand together with other power and thermal energy generation and management systems.
- Solutions need to address the **complexity of ship integration** (e.g. the balance of plant components, batteries for dynamic loads and waste heat recovery systems).
- **Develop a high-temperature system** as a large efficient unit and install on-board of a suitable vessel.
- **Demonstrate the superiority of a FC solution over conventional ICEs.**
- The project will address the propulsion architecture and/or the electric system, **it will not address the development of new FCs.**



Enabling climate neutral, clean, smart, and competitive waterborne transport

- HORIZON-CL5-2021-D5-01-08: **Enabling the full integration of very high power fuel cells in ship design using co-generation and combined cycle solutions for increased efficiency with multiple fuels**

Expected Outcome:

- Feasibility and technical demonstration of the **use of high-power fuel cells** in waterborne transport.
- **Proof of scaling up fuel cell installations for all shipping applications**, including main propulsion of a short sea shipping or inland navigation vessel.
- In case of a fuel cell using fossil fuel as input proof of significant efficiency gains in a realistic environment compared to the conventional use of the fuels with consequent reduction in GHG emissions.
- Showing a realistic pathway to the wider use of fuel cell technology in waterborne transport including the assessment of the maturity and resulting mid-term potential of various fuel cell systems.



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-09: CSA identifying waterborne sustainable fuel deployment scenarios

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
-	0.5	1	CSA	7.9.21

Scope:

- Identify and monitor the evolution of different sustainable alternative fuel deployment scenarios (sustainable fuel supplies, operational costs, environmental factors, infrastructure)
- Discussions with sustainable **fuel suppliers** and facilitating the commercial deployment.
- Cooperation with the **H2020 STEERER project**.
- The project will support the waterborne community in the identification of **market trends** with a systematic approach to future scenarios, understanding of uncertainties and critical factors.



Enabling climate neutral, clean, smart, and competitive waterborne transport

- HORIZON-CL5-2021-D5-01-09: **CSA identifying waterborne sustainable fuel deployment scenarios**

Expected Outcome:

- **A full understanding of clean fuel scenarios for different regions** including sensitivity analysis of the different variables, consideration of evolving technologies and their applicability to maritime transport, inland navigation and waterborne operations.
- Development of quantified and dynamic techno-economic models for the uptake of sustainable fuels in a variety of waterborne application cases and for a range of regional conditions, clearly identifying uncertainties and parameters to enable technical and economic viability.
- Support to identify the impacts on ports.



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-10: Innovative on-board energy saving solutions

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
5	20	4	RIA	7.9.21

Scope:

- Potential solutions: reducing thermal, electrical and propulsive loads, optimisation of on-board energy management systems, design based systemic/holistic approaches and/or the use of active/adaptive technologies.
- **Digital solutions** supporting operational strategies and remote monitoring and control.
- Advanced **sensors** integrated with advanced energy management.
- **Cyber security** aspects.



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-10: Innovative on-board energy saving solutions

Scope:

- Potential solutions: waste heat recovery systems, HVAC improvements, new hull forms, advanced propeller and appendages for enhanced hydrodynamics, reduced hull resistance through air lubrication, new automation and control strategies, new coatings employing new high performance materials (in particular lightweight materials such as composites) or enhanced production processes.

Expected Outcome:

- Deliver at the end of the project **deployable energy efficiency solutions** with at least 10% energy savings compared to best available technologies for stand-alone solutions and at least 20% for combined solutions, each on the level of the vessel.



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-11: Hyper powered vessel battery charging system

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
6-7	14	2	*IA	7.9.21

Scope:

- Deliver solutions and technology to minimise high power recharging times at port, explore the applicability of charging solutions to a variety of batteries and their usefulness for different ship types
- **Develop standard interfaces** which ensure a seamless integration of different electric ships into conventional port and ferry terminal operations
- The following aspects need to be addressed: Ease and required connection time, flexibility regarding power levels and energy transfer whilst minimising impacts on electrical grid infrastructure, addressing potential battery degradation during fast charging, impacts on materials through e.g. corrosion and thermal stress.



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-11: **Hyper powered vessel battery charging system**

Expected Outcome:

- At least **two full scale demonstrators in two European ports** showing the practical use for an end-to-end service between these ports.
- **Demonstration and performance-assessment** in a realistic environment of fast multi-MW recharging systems, leading to an increase in the technical and economic viability of battery electric shipping.
- **Market analysis** and feasibility-assessment of the more wide-spread deployment of fast high power electrical charging of vessels in European ports.



Enabling climate neutral, clean, smart, and competitive waterborne transport

- HORIZON-CL5-2021-D5-01-12: Assessing and preventing methane slip from LNG engines in all conditions within both existing and new vessels

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
7	7	1	*IA	7.9.21

Scope:

- Projects will address the current state of the art and the scatter of emissions between different types of LNG-powered engines.
- Assessment, comparison and making available data on operational data on methane slip from existing engine installations.
- Activities will lead to a **better understanding of the parameters involved** in order to develop the most efficient abatement strategies through ICE improvement and/or post-treatment technologies



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-13: Digital Twin (DT) models to enable green ship operations

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
5	7	1	RIA	7.9.21

Scope:

- Addressing the **DT concept** in order to improve energy efficiency and environmental performance from the early design phase of vessels to the end of the life cycle.
- To develop and validate **methodology for assessing environmental impacts and performance improvements through the DT model**, with the definition of KPIs orienting the design choices and manufacturing processes.
- Project will develop **DT models**, addressing different ship systems (e.g. engine and machinery operations, hull/propeller performance and interaction models, electric network management, HVAC, cargo handling) in order to have a significant impact on energy efficiency and on operational performance



Enabling climate neutral, clean, smart, and competitive waterborne transport

➤ HORIZON-CL5-2021-D5-01-13: **Digital Twin models to enable green ship operations**

Expected Outcome:

- Reduced emissions and improved efficiency enabled through development of **digital models and tools** for a wide range of vessel types, ship systems and operational environments.
- **Ensuring the wider applicability of digital models** for different ship types, both **for new constructions and for retrofitting**, through a comprehensive methodology and a transferable system architecture.
- Increase the confidence of investors concerning the expected improvements in energy efficiency and reduced emissions resulting from upgrades and modifications for both new designs and retrofitting.



Enabling climate neutral, clean, smart, and competitive waterborne transport

- HORIZON-CL5-2021-D5-01-14: Proving the feasibility of a large clean ammonia marine engine

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
6-7	10	1	*IA	7.9.21

Scope:

- The aim is to develop, demonstrate and validate a **multi-cylinder internal combustion engine of at least 10 MW power output running on ammonia** as its main fuel, with IMO-Tier III or lower NOx emissions and negligible emissions of SOx, particulates and other harmful substances or odours.
- Projects should demonstrate the engine operating at its rated power in a laboratory or on board of an actual vessel.



Enabling climate neutral, clean, smart, and competitive waterborne transport

- HORIZON-CL5-2021-D5-01-14: **Proving the feasibility of a large clean ammonia marine engine**

Expected Outcome:

- Enable the timely transformation of the existing maritime fleet towards climate neutrality through retrofiting of existing vessels with ammonia-fuelled engines.
- Demonstration and validation of an ammonia-fuelled marine engine with power output in the +10 MW range. **The validation shows safe and reliable operation in realistic scenarios and for a range of load cases.**
- Analysis of pathways to ammonia as a marine fuel through the **establishment of regulations and solutions for health and safety issues.**



Enabling climate neutral, clean, smart, and competitive waterborne transport

Topic	Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
HORIZON-CL5-2022-D5-01-01: Exploiting electrical energy storage systems and better optimising large battery electric power within fully battery electric and hybrid ships	7	16	2	IA*	26.4.22
HORIZON-CL5-2022-D5-01-02: Innovative non-battery electric energy storage systems on-board vessels	5	15	3	RIA	26.4.22
HORIZON-CL5-2022-D5-01-03: Exploiting renewable energy for shipping, in particular focusing on the potential of wind energy	5	18	2	RIA	26.4.22
HORIZON-CL5-2022-D5-01-04: Transformation of the existing fleet towards greener operations through retrofiting	7-8	25	5	IA*	26.4.22
HORIZON-CL5-2022-D5-01-05: Seamless safe logistics through an autonomous waterborne freight feeder loop service	5	15	1	RIA	26.4.22
HORIZON-CL5-2022-D5-01-06: Computational tools for shipbuilding	7-8	7	1	IA	26.4.22

Impact of transport on environment and human health

➤ HORIZON-CL5-2021-D5-01-15: **Development and demonstration of cost affordable and adaptable retrofit solutions for tailpipe and brake polluting emissions**

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
8	10	2	IA	7.9.21

Scope:

- Developing and demonstrating **new and low cost retrofit technologies** for natural gas buses and natural gas and gasoline cars.
- **Raising awareness** of little-known emissions issues and **incentive schemes** to facilitate the adoption of these technologies.
- Assess the **contribution of brake particles on local air and water quality**, possibly including citizen science contributions. to **develop low cost retrofit solutions** and to assess their benefit and usability/operating cost.



Impact of transport on environment and human health

- HORIZON-CL5-2021-D5-01-15: **Development and demonstration of cost affordable and adaptable retrofit solutions for tailpipe and brake polluting emissions**

Scope:

- Retrofit solutions for **reducing exhaust noise**.

Expected Outcome:

- **Cleaner urban air and water quality and reduced health impacts** and damage to historic buildings due to lower emissions from road transport by 2025.
- **Reduced health impact for highly exposed groups** like public transport workers and users (emissions from brakes).
- Affordable and adaptable **retrofit solutions to reduce particle emissions by over 90%** for particles both in terms of numbers and mass (emissions from brakes).
- **Reduced impact by heavy metals on soil and surface and ground waters** (emissions from brakes).



Impact of transport on environment and human health

➤ HORIZON-CL5-2021-D5-01-16: Assessment of noise and particle emissions of L category vehicles from real driving conditions

Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
5-6	5	1	RIA	7.9.21

Scope:

- Assess the behaviour of a large sample of these L vehicles in real driving conditions for both noise and emissions in **comparison with certification tests**.
- Assess the real world **driving behaviour** that can produce particularly high annoyance and effect on health (noise emissions).
- Propose **technical improvements in the standard test procedure** so that the tests could improve measurement technology for detecting nanoparticles.
- Assess how significant the impact of these emissions is on urban environments and health and examine whether the current regulatory limits are sufficient.
- Develop reliable technological solutions for better enforcement of the regulatory measures for detecting noise.



Impact of transport on environment and human health

- HORIZON-CL5-2021-D5-01-16: **Assessment of noise and particle emissions of L category vehicles from real driving conditions**

Expected Outcome :

- **In-depth assessment** of the noise and pollutant emissions of at least 150 L category vehicles.
- **Measures** for mitigating the noise from L category vehicles.
- Development of reliable **detection techniques** for tampered L category vehicles.
- **Best practices** for integrating a growing number of L category vehicles in the urban traffic. without increasing the noise and emission pollution.



Impact of transport on environment and human health

Topic	Expected TRL	Topic Budget [M€]	No. of Projects	Action	Deadline
HORIZON-CL5-2022-D5-01-07: Prevent smog episodes in Europe: Air quality impact of engine-emitted volatile, semi volatile and secondary particles	5	7	3	RIA	26.4.22



Finding Partners

1. Use your network
2. Take part in future brokerage events
3. Search [previously funded projects](#)
4. Use us – send to us a one pager



Prepare a topic-specific one-pager

1. Use an official logo paper, pay attention to graphics as well as content
2. Start with a title that explains exactly what you want so that target crowd will actually read it : *An Israeli SME/Researcher/NGO <hyperlink to your website> ... that specializes in... is looking for an opportunity to join a consortium preparing a proposal under call topic XYZ...*
3. If you have already participated in an EU funded project, mention it immediately after the title – experience makes you very attractive!
4. The first paragraph should explain EXACTLY how is your expertise relevant to the chosen call topic.
 - If you have more then one in mind, prepper several different one-pagers.
 - This is the most interesting paragraph.
 - No potential partner will guess or think for you how you can fit.
5. Only then write about yourself, your expertise and your achievements. This is interesting only if someone found the beginning of this one-pager interesting enough to keep on reading...
6. Lastly Your Full contact details.
7. Send the one-pager to: Ofir.Weltsch@iserd.org.il



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Israel-Europe R&I Directorate

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