



European  
Commission

# Enabling Smart and Green Logistics

**Contribution of research  
and innovation projects  
implemented by CINEA**



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European Climate, Infrastructure and Environment Executive Agency (CINEA)  
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PDF ISBN 978-92-9405-022-9 doi: 10.2926/504474 HZ-04-23-917-EN-N

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# Foreword

I am delighted to present this new brochure showcasing freight transport and logistics projects supported by CINEA, the European Climate, Infrastructure and Environment Executive Agency.

This rapidly evolving and growing sector enables the free movement of goods, which is one of the fundamental principles of the European Union. Efficient freight and logistics services govern the day-to-day operations of supply chains that underpin the intra-EU and international flow of goods and materials. This is key for the competitiveness and growth of the European economy. Mirroring global trends, the European freight and logistics sector has demonstrated steady growth over the past decade. This trend is set to continue.

However, while this growth brings jobs and economic prosperity, it also comes with challenges, such as congestion and high costs for the environment. As the transport sector is responsible for a quarter of total greenhouse gas emissions (GHG), we must make our transport system, including freight and logistics services, more sustainable – in line with the European Green Deal’s aim to reduce transport-related GHG emissions by 90% in the EU by 2050. The transport system should also be safe and offer resilience in case of local, regional, or global disruptions.

The European Commission’s [“Sustainable and smart mobility strategy”](#) offers the blueprint for actions that will help to achieve this ambition. The strategy aims at “greening” the freight transport sector by identifying and rolling

out technical and organisational solutions to significantly reduce emissions, while maintaining a resilient, competitive, and high performing freight and logistics sector.

In CINEA, we are responsible for the implementation of a €477.9 million portfolio of EU research and innovation (R&I) projects – funded under the EU’s flagship research programmes, Horizon 2020 and Horizon Europe – aiming at smarter, less polluting and more energy-efficient freight transport and logistics operations.

This brochure provides a snapshot of a representative sample of these projects and their results. This includes innovations in supply chain management and urban logistics, last-mile delivery robots, automated delivery vehicles,

and data sharing modelling, among others. We are proud of the work of our beneficiaries and are confident that these projects will make an important contribution towards more efficient, resilient, and greener freight transport and logistic operations.

I hope you find this brochure interesting and informative!

**Paloma Aba Garrote**  
**CINEA Director**





# Introduction

The logistics and freight transport sector is a key enabler for the free flow of goods throughout the EU, underpinning trade and fostering economic growth. Timely freight transport is vital to the prosperity of many businesses across Europe and for the delivery of basic goods to citizens, as witnessed during the Covid-19 pandemic.

## Opportunities and challenges

However, the sector is associated with local pollution and greenhouse gas emissions, due to its traditional high dependence on fossil fuels. In addition, freight vehicles also contribute to congestion, road accidents and noise. It is also in a process of profound transformation driven by the on-demand economy, e-commerce and digitalisation, as well as by the uptake of zero-emissions vehicles and new mobility services.

After the initial slowdown during the pandemic, the sector has rapidly recovered and is currently growing at a fast pace. In terms of tonne-kilometres (tkm), European road freight transport increased by 6.5 % from 2020 to 2021.<sup>1</sup> While this creates opportunities to maintain and improve competitiveness, significant challenges need to be addressed in the years to come:

- **Environmental challenges:** the EU is transitioning to a more sustainable and low-carbon economy. Transport is responsible for around one quarter of Europe's greenhouse gas emissions. The decarbonisation of the sector is at the centre of the EU Green Deal goals.

- **Technological challenges:** such as handling and sharing of vast amounts of sensitive data necessary for optimising transport flows, but which require a high computational power as well as strict security standards. .
- **Societal challenges:** requiring a thorough analysis of the impacts of technologies such as automated vehicles on both public perception and acceptance as well as on the labour market, where new skills and requalification of the existing workforce will be required.
- **Regulatory challenges:** such as developing and putting in place the frameworks that are necessary for the introduction of new solutions and technologies, which are sometimes disruptive (AI applications, automated transport operations and vehicles, etc).
- **Geographical and political challenges:** reducing the vulnerability of international supply chains to physical and political developments (e.g., pandemics, natural hazards, climate-induced route changes, trade sanctions, export controls, “re-shoring” of strategic sectors, etc).

*“Even though EU greenhouse gas emissions (GHG) have decreased continuously over the last decade, CO<sub>2</sub> emissions from heavy-duty vehicles increased every year since 2014, dropping only in 2020 because of the COVID-19 pandemic. And while the efficiency of heavy-duty vehicles transport (vehicles and logistics) has improved, it has not reduced total GHG. This is because increases in demand for freight transport have outpaced efficiency gains”<sup>2</sup>*

**European Environmental Agency**

## R&I at the forefront to respond to challenges

These challenges are complex, sometimes interrelated and cannot be tackled by one-size-fits-all solutions. They should rather be tackled by deploying sets of complementary and mutually reinforcing solutions. For instance, multimodal freight operations have a clearly proven potential for reducing environmental impacts. Similarly, horizontal cooperation between different stakeholders in the logistics chain can bring greater gains in terms of efficiency, lower operational costs and reduced environmental impacts. Automated transport and advanced transshipment technologies can decrease operating costs and increase safety.

Yet, many of these solutions have not been fully matured. They are not yet fully exploited or are regarded as difficult or costly to implement. That is why the EU dedicates significant financial support to unleash the full potential of the technological and organisational innovations in the freight and logistics domain.

This brochure presents an overview of the contribution of research and innovation (R&I) projects in the following four areas:

- Horizontal cooperation and multimodal operations
- New trade routes/Trans-European Networks (TEN-T)
- New concepts & technologies
- Automation

## Exploiting synergies

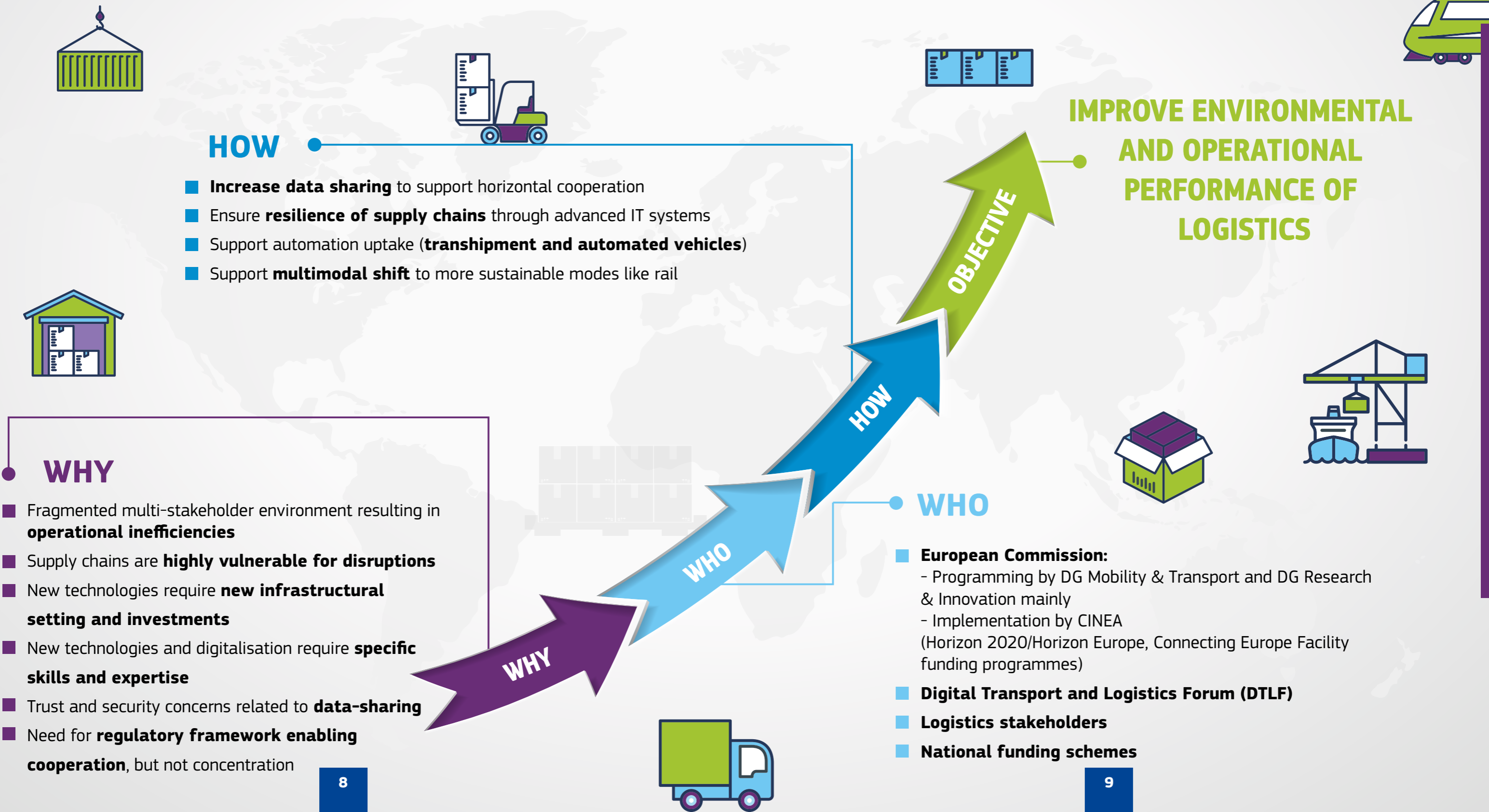
These projects also pave the way towards large scale deployment. There is much potential to facilitate the deployment of research results in the logistics field through EU funding programmes, such as the Connecting Europe Facility (CEF). CEF focuses on building a modern infrastructure in the EU, including for more efficient and sustainable transport freight and logistics.

This calls for reinforced efforts from stakeholders and programmes to further exploit and scale-up the results of EU funded R&I projects. In addition, EU policy needs to closely monitor the economic, technological, geo-political and organisational trends, and when necessary, react and adapt.

<sup>1</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Road\\_freight\\_transport\\_statistics&oldid=583881](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Road_freight_transport_statistics&oldid=583881)

<sup>2</sup> Briefing: [Reducing Greenhouse Gas Emissions from Heavy-Duty Vehicles in Europe, European Environment Agency, 2022](#)

# Enabling smart and green logistics - the R&I pathway



## HOW

- **Increase data sharing** to support horizontal cooperation
- Ensure **resilience of supply chains** through advanced IT systems
- Support automation uptake (**transshipment and automated vehicles**)
- Support **multimodal shift** to more sustainable modes like rail

## IMPROVE ENVIRONMENTAL AND OPERATIONAL PERFORMANCE OF LOGISTICS

## WHY

- Fragmented multi-stakeholder environment resulting in **operational inefficiencies**
- Supply chains are **highly vulnerable for disruptions**
- New technologies require **new infrastructural setting and investments**
- New technologies and digitalisation require **specific skills and expertise**
- Trust and security concerns related to **data-sharing**
- Need for **regulatory framework enabling cooperation**, but not concentration

## WHO

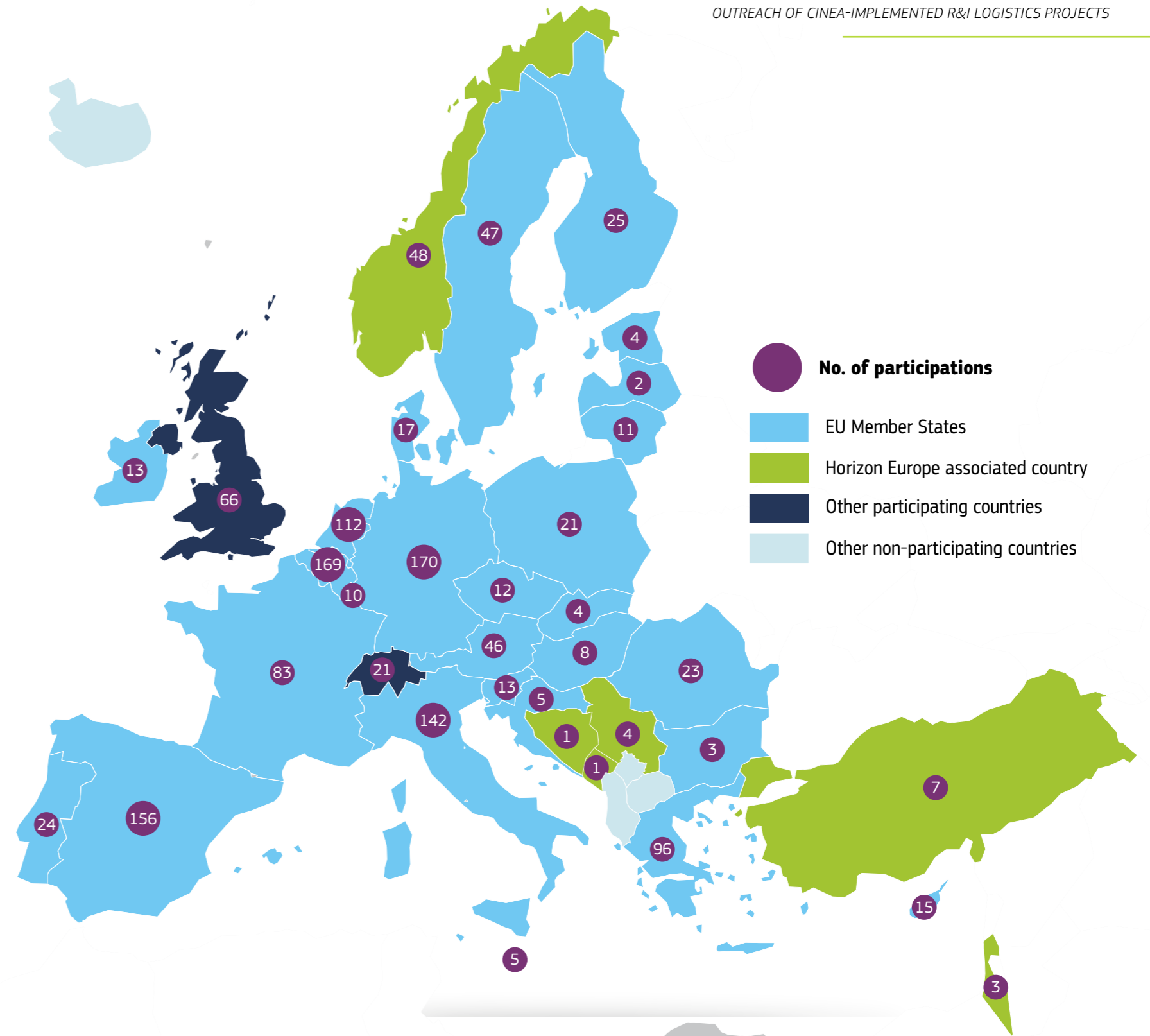
- **European Commission:**
  - Programming by DG Mobility & Transport and DG Research & Innovation mainly
  - Implementation by CINEA (Horizon 2020/Horizon Europe, Connecting Europe Facility funding programmes)
- **Digital Transport and Logistics Forum (DTLF)**
- **Logistics stakeholders**
- **National funding schemes**

# Outreach of CINEA- implemented R&I logistics projects

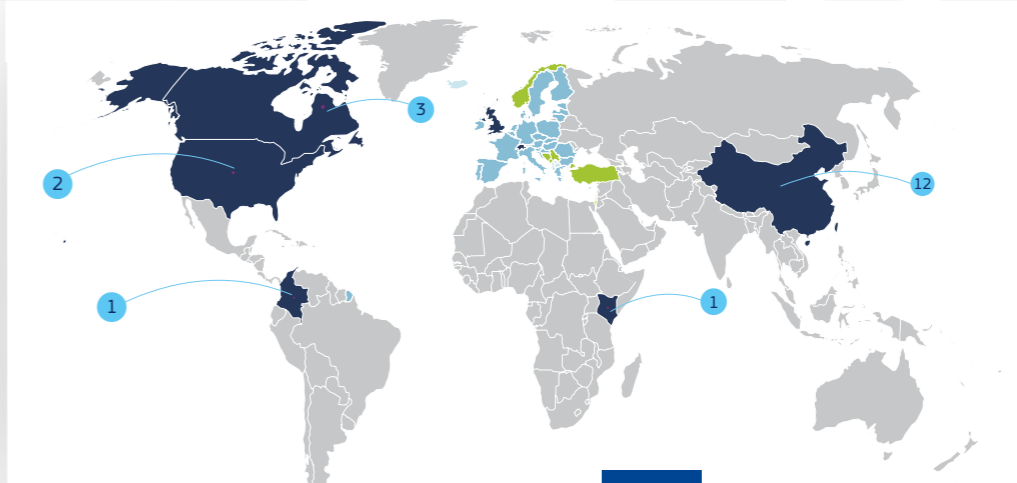
**60** NO. OF PROJECTS

**1,406** NO. OF PARTICIPATIONS

**€477.9 M** TOTAL EU FUNDING



Programme	Number of projects	EU contribution (€ M)
HORIZON 2020	38	276.9
HORIZON EUROPE	22	201
<b>Grand Total</b>	<b>60</b>	<b>477.9</b>



# AEOLIX

## Linking Europe’s logistics information systems

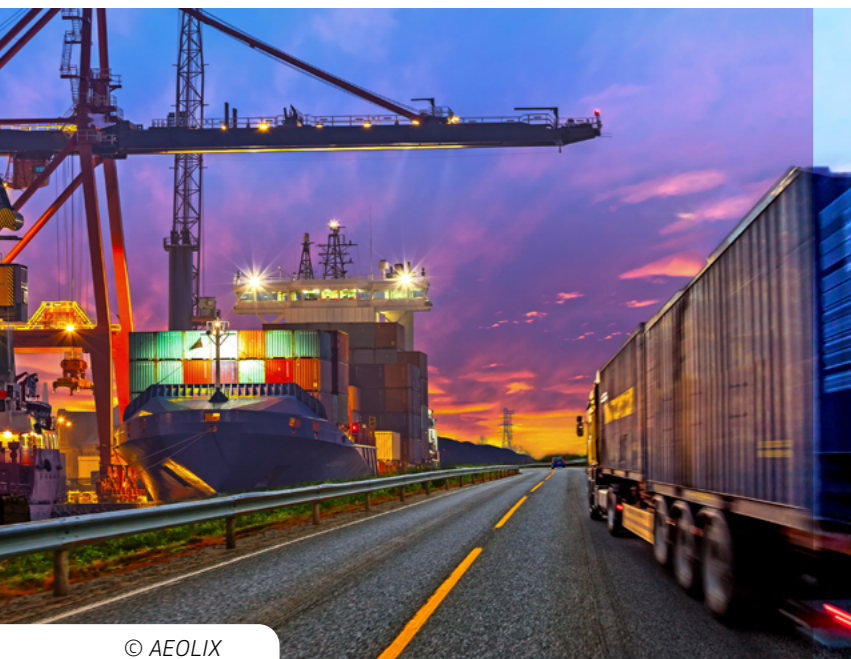
The logistics sector is very fragmented and lacks a collaborative environment. Logistics processes typically involve a multitude of actors, all of whom are likely to use different IT systems and solutions. Supply chain visibility, supported by easy access to, and exchange of, logistics-related information, is a prerequisite for the deployment of pan-European logistics solutions. This will not only increase efficiency and productivity, but also reduce environmental impact.

To overcome this fragmentation, AEOLIX (Architecture for European Logistics Information eXchange) developed a collaborative IT infrastructure for the configuration and management of logistics-related information pipelines. The aim of this demand-driven approach was to enable stakeholders working with different systems to better plan, manage, and synchronise facilities in the supply chain. This included not only prospective end-users of the platform, such as transport companies or port authorities, but also public authorities and infrastructure managers, service providers and developers, and technology suppliers.

Eleven ‘Living Labs’ explored the collaborative approach championed by the project. These case studies demonstrated how proposed improvements can help streamline processes and make operations more efficient, productive, and sustainable. Several studies were undertaken, covering specific hubs, as well as operations across larger areas. The study in the French city of Bordeaux, for instance, focused on the flow of data relevant to customs clearance and control of dangerous goods. Another facilitated automated information exchange along the Danube, notably to reduce the number of empty cargo transports.

As a result, AEOLIX facilitated information exchange more easily and efficiently (without investment), enabled larger-scale implementation, increased the degree of system interoperability, and of flexibility, in relationship management of logistics actors.

*The consortium consisted of 12 partners from 11 EU Member States and from the United Kingdom.*



# AWARD

## Autonomous transportation system for logistics improvement

Connected and automated driving systems for commercial vehicles have great potential. They can improve safety and efficiency of freight transport both in confined areas and in mixed traffic (hub-to-hub) and make logistics operations more competitive.

Significant progress has been made in the field of autonomous truck driving with numerous prototypes. However, autonomous heavy-duty vehicles still face challenges when it comes to operating safely and functionally around the clock, and in all weather conditions. Along with the lack of a harmonised regulatory framework, this hinders their development and the uptake of this breakthrough technology towards an overall autonomous logistic chain.

This is the context against which the AWARD (All-Weather Autonomous Real logistics operations and Demonstrations) project is developing and testing a safe autonomous transportation system (ATS) in a wide range of real-life logistics use cases, occurrences, and scenarios.

The project is also developing an autonomous driving system (ADS) tested in multiple use cases and scenarios, capable of handling adverse environmental conditions such as heavy rain, snowfall, and fog. The ADS will be integrated into multiple vehicle types used in low-speed areas. The solution will rely on multiple sensor modalities offering 24/7 availability and a new fleet management system for optimised logistics.

*The consortium consists of 37 partners from nine EU Member States, Israel and Norway (Horizon Europe associated countries), Switzerland and the United Kingdom.*



**COORDINATOR**

ERTICO – ITS Europe (Belgium)

**PROJECT DURATION**

01/09/2016 – 31/08/2019

**EU FUNDING**

€16,220,106

**WEBSITE**

<https://aeolix.eu/>

**COORDINATOR**

EASYMILE (France)

**PROJECT DURATION**

01/01/2021 – 31/12/2023

**EU FUNDING**

€19,892,906

**WEBSITE**

<https://award-h2020.eu/>

# BOOSTLOG

## Boosting the impact of EU-funded research in freight transport and logistics

The vision of the BOOSTLOG (BOOSTing impact generation from research and innovation on integrated freight transport and LOGistics systems) project is to transform the freight transport and logistics R&I ecosystem to boost the impact of R&I investment. It aims at enhancing the quality of services in these sectors, while ensuring business competitiveness and contributing towards wider EU policy goals on climate and sustainability.

To achieve these goals, BOOSTLOG focuses activities on four main areas:

- Increasing visibility and supporting valorisation of 160 R&I project results, outcomes and implementation cases in the freight transport and logistics field;
- Overcoming barriers for R&D deployment, identify and define valorisation strategies and guidelines to

speed up the technological and organisational innovation uptake. This includes the creation of an Innovation Marketplace<sup>1</sup> within the ALICE knowledge platform<sup>2</sup>, and provision of recommendations to key stakeholders;

- Identifying and defining high potential & priority R&I gaps to make efficient use of research investments;
- Reinforcing the dissemination of project outputs to end users of the freight transport and logistics sector. This includes building collaboration frameworks for the exchange of best practices in freight transport and logistics R&I at regional, national, and European levels, and engaging with relevant stakeholders in the innovation process.

*The consortium consists of 13 partners from seven EU Member States.*

1 <https://knowledgeplatform.etp-logistics.eu/course/view.php?id=259>

2 <https://www.etp-logistics.eu/knowledge-platform/>

# CLUSTERS 2.0

## Logistics clusters solutions

‘Living Labs’ to test, improve and validate the proposed solutions and develop the required business models.

Some of the project solutions included innovative transshipment technologies, tools and procedures for collaborative planning, as well as ICT services to enhance and facilitate co-operation and connectivity within logistics clusters. This included a:

- New Modular Loading Unit (NMLU) – to enable a fast and flexible transshipment of modular units in various layouts;
- Cluster Community System – an IT platform to establish communication connectivity within and across cluster stakeholders;
- CARGOSTREAM SaaS concept – to optimise and promote intermodal flows through bundling and aggregation of transport demand on logistics clusters networks.

*The consortium consisted of 32 partners from 8 EU Member States, Switzerland, and the United Kingdom.*

Logistics clusters are crucial for generating growth, employment, and competitiveness. If well-established, these geographically concentrated sets of logistics-related businesses and operations, like transport carriers, warehouses, and third-party logistics service providers, can evolve into thriving sources of innovation.

Set up with the vision of unleashing the full potential of European logistics clusters, the CLUSTERS 2.0 project has made significant progress in enhancing the performance and coordination of terminals and hubs that are active in a cluster. It sought to provide a pathway for logistics hubs to evolve from applying a traditional point-to-point approach, towards the application of a network approach in line with the Physical Internet (PI).

The hubs involved with CLUSTERS 2.0 include Zaragoza (PLAZA), Duisburg (Duisport), Lille (LDCT Dourges), Bologna-Trieste (Interporto/Port of Trieste), Brussels (BruCargo), London (Heathrow), Liege (Airport), Pireaus (PCT) and Trelleborg (Port), who co-created and implemented specific pilots for enhanced collaboration within and across logistics clusters. The project used



**COORDINATOR**  
 ALLIANCE FOR LOGISTICS INNOVATION THROUGH COLLABORATION IN EUROPE (ALICE) (Belgium)

**PROJECT DURATION**  
 01/01/2021 – 31/12/2023

**EU FUNDING**  
 €999,968

**WEBSITE**  
<https://www.etp-logistics.eu/boostlog/>

**COORDINATOR**  
 PTV PLANUNG TRANSPORT VERKEHR AG (Germany)

**PROJECT DURATION**  
 01/05/2017 – 31/07/2020

**EU FUNDING**  
 €5,998,744

**WEBSITE**  
<https://cordis.europa.eu/project/id/723265>





# COG-LO

## Developing secure and dynamic logistics collaboration

Increasing volumes of e-commerce, and dynamics of manufacturing supply chains, imply new challenges at both operational and technological levels. Ad-hoc delivery requests and unexpected events require greater flexibility. All of this brings questions on how to collaborate and consolidate deliveries in such a way that load factor, “run empty” rates, and all resources are utilised to the maximum.

The COG-LO (COGnitive Logistics Operations through secure, dynamic and ad-hoc collaborative networks) project set out to develop and test a framework that enables dynamic and ad-hoc logistics collaboration in a secure way. This has been achieved by:

- Adding cognitive behaviour to all involved logistics actors (i.e., systems, vehicle, cargo) enabling them to understand and predict possible anomalies;
- Developing a collaborative environment for the exchange of real-time information through secure and trusted networks, allowing service providers to identify nearby opportunities;

- Introducing improved decision-making and optimisation tools supporting ad-hoc requests and various exceptions.

The COG-LO consortium consisted of leading companies in different domains: ICT, collaborative networks, security/trust, optimisation, artificial intelligence (AI) and logistics domain experts. The project outcomes have been validated in three different scenarios covering multi-modality, inter-country deliveries, and urban logistics operations.

By exploiting COG-LO solutions it is possible to achieve several benefits, such as an increase in the load factor, a reduction of the cross-border parcel delivery costs, a reduction of the ratio between distance covered by the logistic vehicles and the number of pickups, a faster and adaptive response management to dynamic customer requirements.

Successfully completed in September 2021, COG-LO researched the development of Cognitive Logistics Object (CLO) and developed a secure IT environment to exchange information through ad-hoc social secure networks.

# ENSEMBLE

## Enabling safe multi-brand platooning

While platooning technology has significantly advanced in the last decade, moving towards the deployment of truck platooning requires an integral multi-brand approach. In this context, the ENSEMBLE (Enabling Safe Multi-Brand pLatooning for Europe) project set out to implement and demonstrate multi-brand truck platooning on European roads.

The project aimed at standardising different aspect of platooning to enable interoperability between trucks, platoons and logistics solution providers. This included, for example, manoeuvres for forming and dissolving platoons, operational conditions, communication protocols, and safety mechanisms. The goal was to speed up market take-up of the system development and implementation and harmonise legal frameworks across the EU.

ENSEMBLE brought the key deployment stakeholders together: six major original equipment truck manufacturers formed the core of the project consortium, supported by the European Association of Automotive Suppliers, which acted as an umbrella organisation to involve all relevant suppliers. A limited

number of expert organisations were involved to cover specific topics such as safety assessment, traffic impact, and platoon control system design.

During the first year, the consortium concentrated on setting the specifications for the implementation of multi-brand platooning. Truck manufacturers and suppliers followed up for implementation on their own trucks in the second year, while the knowledge partners performed impact assessments. In the final year, the focus was on testing the multi-brand platoons on test tracks and international public roads. The evaluation of technical results against the initial requirements also included the impact on fuel consumption, drivers, and other road users.

This will help to pave the way for the adoption of multi-brand truck platooning in Europe, and improve fuel economy, traffic safety and throughput over the longer term.

*The consortium consisted of 25 partners from seven EU Member States and the United Kingdom.*



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### COORDINATOR

CNIT (Italy)

### PROJECT DURATION

01/06/2018 – 30/09/2021

### EU FUNDING

€4,999,923

### WEBSITE

<http://www.cog-lo.eu/>

### COORDINATOR

TNO (Netherlands)

### PROJECT DURATION

01/06/2018 – 31/03/2022

### EU FUNDING

€19,780,383

### WEBSITE

<https://platooningensemble.eu/>



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# ePICENTER

## Enabling resilient and greener supply chains

The seamless transport of goods is a top priority of the logistics sector. Headed by a consortium of partners representing leading ports, forwarders, cargo owners, logistics providers, knowledge institutions and technology firms, the ePcenter project aims to increase the efficiency and sustainability of global supply chains.

ePcenter (Enhanced Physical Internet-Compatible Earth-frieNdly freight Transportation ansWER) offers a toolset of AI driven logistics software solutions and new transport technologies to manage the increasing complexity of supply chains. The toolset includes a data-sharing layer to exchange data in a safe, secure, and trusted environment. In addition, a visibility solution combining the data, will provide insights into various aspects such as carbon footprint monitoring, cargo status, exception handling, and freight cost monitoring.

The project is also developing different synchromodal logistics algorithms that address a wide range of optimisation and planning problems. It is testing new

transport technologies such as modular containers, autonomous e-vehicles and hyperloop scenarios, in different sites across Europe to assess their potential impact on environmental parameters and the overall efficiency of the transport chain.

In parallel, a Freight Network Configuration Comparator is facilitating a better understanding of the impact of new technologies, operating procedures, and new infrastructure on the freight flows. On the maritime side, the development of new ship routing and propulsion optimisation algorithms aims to reduce the fuel usage, GHG emissions and the impact of shipping on whales.

*The consortium consists of 37 partners from 10 EU Member States, Montenegro (Horizon Europe associated country), Canada, China, Colombia, Switzerland, the United Kingdom and the United States.*

ePcenter



### COORDINATOR

Port of Antwerp-Bruges (Belgium)

### PROJECT DURATION

01/06/2020 – 30/11/2023

### EU FUNDING

€6,848,575

### WEBSITE

[www.epicenterproject.eu](http://www.epicenterproject.eu)

# FOR-FREIGHT

## Green and adaptable multimodal freight transport

Multimodal freight transport is a driver of competitiveness and an essential part for resilient supply-chains and logistics systems. Freight transport is also on a green path to meet EU goals, which means stakeholders need to adapt. The FOR-FREIGHT (Flexible, multi-mOdal and Robust FREIGHT) project is helping to realise this green transition by exploring how to:

- maximise capacity of multimodal freight transport that integrates legacy logistics systems with new technologies, and;
- reduce the average cost of freight transport through novel solutions and their connection to legacy logistics systems.

As well as reducing costs, this novel solution will allow better monitoring of goods and emissions throughout the transport process. It will make freight transport more cost-efficient and sustainable, and support better real-time resource planning, handling, and adaptability in the changing market.

The FOR-FREIGHT approach engages world-leading transport and logistics stakeholders specialising in different modes of transport, bringing them together with leading technology developers, research organisations and innovative SMEs. This collaboration drives the deployment of three state-of-the-art trial facilities – to enable real life trials in operational environments covering seaport to logistics hub and last mile, seaport to airport, and river-port to rail multimodal transport scenarios.

A cloud-based experimentation platform is offered by FOR-FREIGHT, integrating access to the three sites, and offering advanced real-time monitoring, planning and decision support tools.

*The consortium consists of 18 partners from seven EU Member States, Norway (Horizon Europe associated country) and from the United Kingdom.*

### COORDINATOR

ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS (Greece)

### PROJECT DURATION

01/09/2022 – 31/12/2025

### EU FUNDING

€7,151,667

### WEBSITE

<https://www.for-freight.eu/>



# ICONET

## Optimising cargo flows through the physical internet

Researchers in the ICONET (New ICT infrastructure and reference architecture to support Operations in future PI Logistics NETWORKS) project set out to investigate the novel concept of the physical internet (PI). While in the digital internet information is transmitted through packets, in the PI goods are transported in standardised containers equipped with trackers and sensors.

The objective with the PI is to enable players in the logistics industry to use multiple routes and engage multiple operators, to help minimise CO<sub>2</sub> emissions, increase transport fill rates, and reduce operational costs, while improving service quality.

ICONET's primary research and innovation focused on collaborative planning of flexible logistic chains. This was implemented through four PI-based services: PI hub; PI corridor; Warehousing and e-commerce fulfilment; Technology and knowledge transfer.

ICONET materialised a proof of concept that facilitated analysis and experimentation of PI concepts. This will serve as a reference for future PI operations supporting open hyperconnectivity, governance, audit trail,

e-commerce, and end-to-end tractability for all aspects of the logistics chain.

The project results are available in the form of easily deployable cloud services based on open and non-proprietary technologies, a PI reference architecture based on open standards, and a demonstrator PI case study enabling interested parties to analyse key PI scenarios.

The infrastructure developed in the project has been deployed and tested at four 'Living Labs':

- Port of Antwerp: PI Hub-centric Network (Belgium);
- P&G: Corridor-centric PI Network (North Sea – Mediterranean Corridor);
- Porto Sonae: e-Commerce centric PI Network (Portugal);
- Paris: Warehousing as a Service (France).

Overall, this research will help improve efficiency in the transport of physical goods and bring wider benefits along the supply chain.

*The consortium consisted of 18 partners from 10 EU Member States.*



# LEAD

## Digital Twins for low emission last mile logistics

Changing consumer habits, accelerated by the successive COVID-19 lockdowns, has led to a boom in online commerce. This pattern, combined with consumer expectations for low or zero cost deliveries and the industry's promises of "instant" delivery, are putting a lot of pressure on delivery systems in urban contexts. This also brings increased pollution, greater congestion and inefficient last-mile logistics.

To respond to these issues, the LEAD (Low-Emission adaptive last mile logistics supporting the on-demand economy through Digital twins) project has designed Digital Twins of urban logistics scenarios to support experimentation and decision-making in public-private urban settings. Headed by a large consortium, the project tested its solutions in six cities 'Living Labs' across Europe: Madrid (Spain), Porto (Portugal), Oslo (Norway), Lyon (France), The Hague (the Netherlands), and Budapest (Hungary). Digital Twins are digital

representations of complex real-world phenomena, which can help to predict patterns through the help of data and simulation models.

Each LEAD 'Living Lab' experimented with use case scenarios on demand and last-mile logistics operations involving both public and private sector bodies. The goal was to create models that can help local decision-makers to make informed decisions when planning their urban logistics networks and for addressing the existing challenges. Ultimately, the long-term goal is to develop an open physical internet-inspired framework for smart city logistics.

*The consortium consisted of 31 partners from eight EU Member States, plus Norway (Horizon Europe associated country), China and the United States.*



**COORDINATOR**

INLECOM GROUP (Belgium)

**PROJECT DURATION**

01/09/2018 – 28/02/2021

**EU FUNDING**

€3,078,699

**WEBSITE**

<https://www.iconetproject.eu/>

**COORDINATOR**

EMPRESA MUNICIPAL DE TRANSPORTES DE MADRID SA (Spain)

**PROJECT DURATION**

01/06/2020 – 31/05/2023

**EU FUNDING**

€3,941,625

**WEBSITE**

[www.leadproject.eu](http://www.leadproject.eu)

# LessThanWagonLoad

## Developing a smart, specialised logistics cluster

The LessThanWagonLoad project aimed at developing a smart specialised logistics cluster for the chemical industry in the Port of Antwerp to shift transport volumes from road to rail freight.

A consortium ranging from research institutes, technology suppliers, freight operators and the chemical industry joined forces to realise contemporary solutions for single pallet loads for trains and specific chemical industry solutions for parking, repair, picking and cleaning of chemical wagons.

The research project deep dived into solutions for rail connected cross docking of pallets and improved rail connections by setting up mixed trains with conventional, continental, and maritime container volumes.

At the completion of the project a prototype for pallet load handling in a rail freight context was ready for further large-scale testing and commercialisation. The business cases and plans for developing a cleaning and repair station have been made and a search for investment partners was launched.

Flexible train products with different types of goods, conventional loads, maritime and/or continental containers are now part of the standard offering of some of the European railway operators.

*The consortium consisted of 14 partners from six EU Member States.*



© LessThanWagonLoad

**COORDINATOR**

LINEAS GROUP (Belgium)

**PROJECT DURATION**

01/05/2017 – 30/04/2020

**EU FUNDING**

€3,994,319

**WEBSITE**

<https://cordis.europa.eu/project/id/723274>

# LOGISTAR

## AI to future-proof the global supply chain

Efficient supply chains are the backbone of the world economy. But as the COVID-19 pandemic made clear, global supply chains can easily be disrupted. That is why it is essential to work to better protect them against future disruptions.

This is where the LOGISTAR (Enhanced data management techniques for real time logistics planning and scheduling) project came in. By taking advantage of the increasingly real-time data gathered from the interconnected environment, LOGISTAR focused on improving effective planning and optimisation of transport operations in the supply chain. It combined intensive use of Internet of Things, Open Data, Artificial Intelligence, optimisation techniques and other ICT advances for effective planning and optimising of transport in the logistics sector.

The main outcome of the project is an end-to-end architecture that can automatically retrieve and harmonise data, send the corresponding messages to the modules in charge of executing different algorithms, and gather results to be displayed to stakeholders.

Essentially the solution takes real-time data and feeds it to AI-based algorithms. These algorithms are then used to run a three main services, each of which is geared towards optimising supply chain operations:

- Optimisation of the operation in the warehouse, by using precise estimated time of arrival prediction, incident detection and efficient re-optimisation;
- Improvement of the routing of the loads in different transport modes, such as trucks, trains, and ships;
- Development of a tool for collaborative planning of resources to share costs and reduce the number of kilometres travelled by empty trucks. This in turn reduces greenhouse gas emissions.

*The consortium consisted of 18 partners from six EU Member States, Serbia (Horizon Europe associated country) and the United Kingdom.*



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**COORDINATOR**

UNIVERSIDAD DE LA IGLESIA DE DEUSTO  
ENTIDAD RELIGIOSA (Spain)

**PROJECT DURATION**

01/06/2018 – 30/09/2021

**EU FUNDING**

€4,997,549

**WEBSITE**

<https://logistar-project.eu/>

# MULTIRELOAD

## Port solutions for efficient and sustainable multimodality

Inland ports are key for multimodal transport chains, for both continental and maritime transport. There are 225 inland ports in Europe, many of which act as key logistics and economic hubs near urban transport junctions.

The MultiRELOAD project is working to enhance the collaboration between different freight nodes in Europe.

Working in a consortium that comprises ports, innovative technology, logistics and service providers, leading European research institutions and well-connected networks, the project will demonstrate solutions in three innovation areas, mirroring the goals of the EU's Smart Mobility Strategy:

- Smart multimodal logistics: to facilitate a shift from road to rail & inland waterways of 5%;
- Digital & automated multimodal nodes and corridors: to increase operational efficiency by 20% of handling capacity;
- Innovative business models: to lead to an average cost reduction of freight transport by 10%.

The project will facilitate a significant shift to sustainable modes of transport, and more efficient supply chains and capacity-sharing (data, infrastructure, loading space, etc.) for all operators.

The two existing business incubators, startport in Duisburg and thinkport in Vienna, will provide business angel expertise for new services and start-ups developing smart multimodal solutions. The project's innovative solutions will be developed further towards sound business plans and models, ready for a wide uptake, thus improving the overall market maturity.

*The consortium consists of 24 partners from eight EU Member States, and Switzerland.*



# PLANET

## Paving the way for more integrated logistics

The Trans-European Transport Network (TEN-T) consists of hundreds of projects aimed at ensuring cohesion, interconnection, and interoperability of all modes of transport across the EU. With TEN-T projects located in every EU member state, numerous challenges are associated with assessing the impact of emerging global trade corridors on the TEN-Ts.

The PLANET (Progress towards federated Logistics through the integration of TEN-T into A global trade NETWORK) project set out to address this issue by demonstrating the emerging concepts of the physical internet (PI) and technologies such as the Internet of Things (IoT) and blockchain in three EU-global real-world corridors (China-EU-US). The project modelled, analysed, demonstrated, and assessed EU-global transport and logistics (T&L) networks (EGTN).

To achieve this, PLANET focused on two R&D pillars centred on understanding and assimilating global geo-economic and trade imperatives, as well as leveraging disruptive technologies and new logistics

concepts for optimising T&L processes. PLANET also delivered a Symbiotic Digital Clone for EGTNs, infrastructure planners, blockchain interoperability and recommendations for the TET-T public consultation.

Three 'Living Labs' contributed to the strategic analysis of global flows:

- PI and blockchain for optimised door-to-door Asia-Europe corridors – Mediterranean Corridor (Port of Valencia);
- Synchronodal dynamic management of TEN-T & intercontinental flows promoting rail transport (Port of Rotterdam);
- Streamlining logistics processes in flows from China to Europe along the Silk Road Route implementing IoT technologies (China – Poland).

*The consortium consisted of 35 partners from 12 EU Member States and China.*



### COORDINATOR

DUISBURGER HAFEN AKTIENGESELLSCHAFT (Germany)

### PROJECT DURATION

01/09/2022 – 31/08/2025

### EU FUNDING

€7,417,813

### WEBSITE

<https://www.etp-logistics.eu/multireload/>

### COORDINATOR

INLECOM GROUP (Belgium)

### PROJECT DURATION

01/06/2020 – 31/05/2023

### EU FUNDING

€7,037,670

### WEBSITE

<https://www.planetproject.eu/>

# PORT FORWARD

## Creating the port of the future

With a focus on the digital transformation of small-to-medium ports, the PortForward project set out to realise its vision of the port of the future: smart, green, and more interconnected. The partners developed and tested their solutions in use case scenarios in five small and medium sized ports.

The project's results are twofold: services developed showing high potential and whose implementation is already being explored in ports, and IT infrastructure components to be further exploited.

- Smart Port Solutions were developed to improve information flows within ports and the port community. One example is the Augmented Reality (AR)-based assistance for container inspection processes. In this use case, port operating personnel are supported by an AR application using smart glasses. Relevant information for container inspection processes is displayed for the operators, and remote support can be given to enable more efficient inspection processes;
- Green Port Solutions focused on the reduction of

the environmental impact of port operations and the saving of resources. This includes the "Green Yard Scheduler" – a decision support tool to optimise container terminal operations with focus on low emissions;

- Interconnected Port Solutions focused on the integration of several data sources to better monitor and control port processes. This resulted in the realisation of a virtual twin of a port, developed for the Port of Magdeburg in Germany. It consists of a complete spatial 3D model of the port, integrating and visualising data from several sources.

Overall, the experiences gained by the ports, using the project solutions, will further boost the digitalisation of port processes and of port communities, and thus also enable a quicker and easier adoption of other novel digital solutions.

*The consortium consisted of 13 partners from five EU Member States, Norway (Horizon Europe associated country) and from the United Kingdom.*



# SELIS

## Information sharing for smarter supply chains

For many years, disjointed IT systems have impeded innovation in logistics technologies. The SELIS project set about unifying business and technology to deliver a Shared European Logistics Intelligent Information Space.

The result is a collaborative, open and cloud-based intelligence platform. This provides a trusted data sharing environment for all logistics stakeholders. It includes the following open-source tools:

- User interface for the SELIS Community Node;
- Secure system for message exchanges between different providers;
- Cloud-enabled big-data framework offering machine learning and analytics capabilities
- Modelling framework for describing logistics ecosystems as knowledge graphs;
- Role/user-based authentication for secure access to logistics data;
- Monitoring tool reporting on SELIS Community Node components health status.

The solutions were tested on various sites:

- Spain: DHL-tested normalisation of semantic data representation;
- The Netherlands: visibility platform for real-time hinterland transport connections;
- Belgium: route and truckload optimisation;
- Greece: recommendation system for third party/ regional agencies collaboration;
- Germany: planning platform for real-time and historical performance evaluation of barge logistics connecting port/hinterland terminals;
- Slovenia: ship-port-multimodal synchronisation;
- Portugal: logistics service quality prediction using machine learning techniques.

*The consortium consisted of 42 partners from 12 EU Member States, Norway (Horizon Europe associated country) and from the United Kingdom.*



### COORDINATOR

FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV (Germany)

### PROJECT DURATION

01/07/2018 – 30/06/2022

### EU FUNDING

€4,994,311

### WEBSITE

<https://www.portforward-project.eu/>

### COORDINATOR

INLECOM SYSTEMS LTD (United Kingdom)

### PROJECT DURATION

01/09/2016 – 31/08/2019

### EU FUNDING

€17,719,375

### WEBSITE

<https://selisproject.eu/>

# SENATOR

## More sustainable urban freight logistics

To manage urban planning policies in an optimal way, the SENATOR (Smart Network Operator Platform enabling Shared, Integrated and more Sustainable Urban Freight Logistics) project aims to produce governance schemes focusing on user demand planning, transport planning, freight and logistics planning, and city infrastructure.

Within this scope, the project is creating a multi-collaborative framework bringing together stakeholders in urban freight logistics. The aim is to develop a smart network operator supported by an ICT platform for integrated logistics operations. It will act on four levels based on demand, fleet and its multimodal options, intelligent route planning and urban infrastructure analysis.

This will enable the optimisation of freight delivery services in urban areas, decreasing the number and distance of delivery routes through real-time

information, predictions and planning based on AI algorithms. Moreover, it will connect goods delivery services and pick-up points and integrate all goods delivery requirements into urban planning.

The project solutions are being tested in 'Living Labs' in Zaragoza (Spain) and Dublin (Ireland). It is coordinated by Correos, the Spanish postal operator, and developed by a consortium including large public and private companies, SMEs, research centres and local governments.

Ultimately, SENATOR is working towards sustainable cities: minimising the negative impacts of freight transport and providing an effective means of collaboration between stakeholders.

*The consortium consists of 15 partners from four EU Member States and the United Kingdom.*



### COORDINATOR

SOCIEDAD ESTATAL CORREOS Y TELEGRAFOS SA (Spain)

### PROJECT DURATION

01/09/2020 – 31/08/2024

### EU FUNDING

€3,999,746

### WEBSITE

<https://www.senatorproject.eu/>

# STORM

## Transforming freight logistics business structures

The current landscape of freight transport and logistics is undergoing an intensive transformation. In view of the latest trends in digitalisation and electrification, these sectors must adapt to rapidly transforming market structures and logistics business models, as well as conform with legislative and policy frameworks to minimise environmental impact and curb CO<sub>2</sub> emissions.

The STORM (Smart freight TranspOrt and logistics Research Methodologies) project set out to explore novel concepts for freight and logistics with the aim of supporting the transition of the transportation sector towards a sustainable future.

STORM brought stakeholders together to gather knowledge about the needs of the freight transport sector. The project developed advanced methods and tools for monitoring, assessing and analysing freight transport and logistics solutions designed during the project. New data sources, data collection and

processing methods were generated to support the usage of the freight analysis tools, as well as three use cases focusing on zero-emission freight, city logistics and EU policies to explore the developed concepts in more detail.

As an outcome of the project, recommendations to transport planners, policy makers and the research community will further promote and support the uptake of sustainable freight solutions.

*The consortium consisted of five partners from five EU Member States.*

### COORDINATOR

VTT Technical Research Centre of Finland (Finland)

### PROJECT DURATION

01/01/2021 – 31/08/2023

### EU FUNDING

€1,530,142

### WEBSITE

<https://project-storm.eu/>



# SYNCHRO-NET

## Simulation tool optimises logistics planning

The Synchro-NET (Synchro-modal Supply Chain Eco-Net) project developed a platform called eco-NET, designed to catalyse the uptake of novel logistics concepts, such as slow steaming ship simulation and synchro-modality, in a cloud-based eco-system.

Through the eco-NET platform, users can find the best possible itinerary of carriers between sender and consignee and compare several different multimodal solutions through key performance indicators (KPIs) and key risk indicators (KRIs).

The project demonstrated how to ensure cost-effective robust solutions that de-stress the supply chain and reduce emissions and costs for logistics operations, while increasing reliability and service levels for logistics users.

In terms of technological implementation, the eco-NET platform is structured as a web application with a map-based, user-friendly interface. It is divided into different modules supporting the strategic planning phase, as well as the operational booking and

scheduling phase. This enables the users to create reliable plans for freight transportation from one origin to one or many destinations, while allowing for intermediary stops and different transport options.

A central role is played by the interaction between the following three modules: the Supply Chain Simulator, the Risk Analysis Module, and the Real-time Synchro-modal Module. The system enables the final users to monitor different KPIs such as distance, time, and emissions, and KRIs, such as time and cost reliability, safety, and flexibility.

Three demonstrators were used to test the solution: the East-West Trade Lane Demonstrators, Regional Demonstrators, and the Pan-European Demonstrator.

*The consortium consisted of 21 partners from six EU Member States, Norway (Horizon Europe associated country) and from the United Kingdom.*

# ULaaDs

## Designing a zero emissions urban logistics sector

The ULaaDS (Urban Logistics as an on-Demand Service) project sets out to offer a new approach to system innovation in urban logistics. Its vision is to develop sustainable and liveable cities through re-localisation of logistics activities and re-configuration of freight flows at different scales.

ULaaDS will use a combination of innovative technology solutions (vehicles, equipment and infrastructure), new schemes for horizontal collaboration (driven by the sharing economy) and policy measures as catalysers of a systemic change in urban and peri-urban service infrastructure.

Specifically, the project is developing, testing and demonstrating the following in three cycle-friendly pilot cities – Bremen (Germany), Groningen (The Netherlands) and Mechelen (Belgium):

- Containerised last-mile delivery with modular heavy cargo-bikes via micro-hubs;
- Cargo-bike sharing as alternative to using a car for private micro-logistics (e.g., grocery shopping,

school run, weekend trips);

- Multimodal hub on park and ride site with neutral parcel-lockers;
- Integration of parcel transport in automated minibuses combining on demand passenger and goods transport.

The project partners include local authorities, logistic operators, private research institutes and universities, NGOs and consulting agencies. ULaaDS has a special focus on integrating logistics solutions in Sustainable Urban Mobility Plans (SUMP) and developing Sustainable Urban Logistic Plans (SULPs), demonstrating the potential of cargo-bikes for commercial transport as for private micro-logistics in a cycle-friendly environment.

*The consortium consists of 27 partners from seven EU Member States, plus Norway (Horizon Europe associated country) and the United Kingdom.*



### COORDINATOR

DHL EXEL SUPPLY CHAIN SPAIN SL (Spain)

### PROJECT DURATION

01/05/2015 – 31/10/2018

### EU FUNDING

€7,569,195

### WEBSITE

<https://www.synchronet.eu/>

### COORDINATOR

FREIE HANSESTADT BREMEN (Germany)

### PROJECT DURATION

01/09/2020 – 29/02/2024

### EU FUNDING

€3,149,515

### WEBSITE

<https://ulaads.eu/>





# Horizon Europe – support for transport research

**Horizon Europe is the EU's ambitious research and innovation funding programme for 2021-2027, with a budget of €95.5 billion.**

It is the successor to the Horizon 2020 programme and is designed to tackle climate change, help achieve the UN's Sustainable Development Goals, and boost the EU's competitiveness and growth. The programme facilitates collaboration and strengthens the impact of research and innovation in developing, supporting, and implementing EU policies while tackling global challenges.

**CINEA implements the funding under "Cluster 5: Climate, Energy and Mobility".**

A cluster is a grouping of topics under Horizon Europe. Cluster 5 focuses on climate action, and improving the sustainability, security, efficiency and competitiveness of the energy and **transport sectors**.

Areas of intervention in relation to transport and mobility include: **clean, safe and accessible transport; and smart mobility, and industrial competitiveness in transport.**

Cluster 5 logistics-related activities are implemented via several partnerships, such as Towards Zero-Emission Road Transport, Batteries, Zero-Emission Waterborne Transport and Connected, Cooperative and Automated Mobility, as well as via the Horizon Europe project calls under Destination 6: Multimodal transport, infrastructure and logistics.

# Synergies between transport funding instruments



EU programmes for research and innovation, Horizon 2020 and Horizon Europe, have always strongly supported research in logistics. A number of results have reached a significant level of maturity in terms of Technological Readiness. However, they still require support to reach market readiness and full-scale deployment.

For this reason, ensuring synergies between Horizon Europe and the EU infrastructure programme, the Connecting Europe Facility (CEF), is of paramount importance.

CINEA implements most of the CEF programme budget – in total €31.65 billion out of the €33.7 billion available for the years 2021 to 2027 (namely €25.81 billion for transport and €5.84 billion for energy), while the European Health and Digital Executive Agency (HaDEA) implements €2.07 billion for digital). In the transport sector, CEF focuses on upgrading and building modern and safe transport infrastructure – improving cross-border connections and further developing the Trans-European Transport (TEN-T) corridors.

More specifically, in the logistics domain, CEF supports the development of the physical and IT infrastructure required to deploy advanced freight transport operations able to combine a lower environmental footprint and a higher operational performance. To achieve this goal, CEF supports investments for the development of railway infrastructure, inland waterways, maritime and inland ports, rail-road terminals and multimodal logistics platforms. The CEF programme has so far invested more than €300 million in the logistics sector.

# CINEA in brief

**The European Climate, Infrastructure and Environment Executive Agency has been established by the European Commission to implement parts of EU funding programmes for transport, energy, climate action, environment and maritime fisheries and aquaculture.**

CINEA has a multinational team, including specialists in project management, financial management, legal affairs and communication.

Seven European Commission's Directorates-General oversee CINEA's activities:

- » DG Mobility & Transport (MOVE)
- » DG Energy (ENER)
- » DG Research & Innovation (RTD)
- » DG Climate Action (CLIMA)
- » DG Environment (ENV)
- » DG Maritime Affairs and Fisheries (MARE)
- » DG Regional and Urban Policy (REGIO)

## Providing added value to beneficiaries

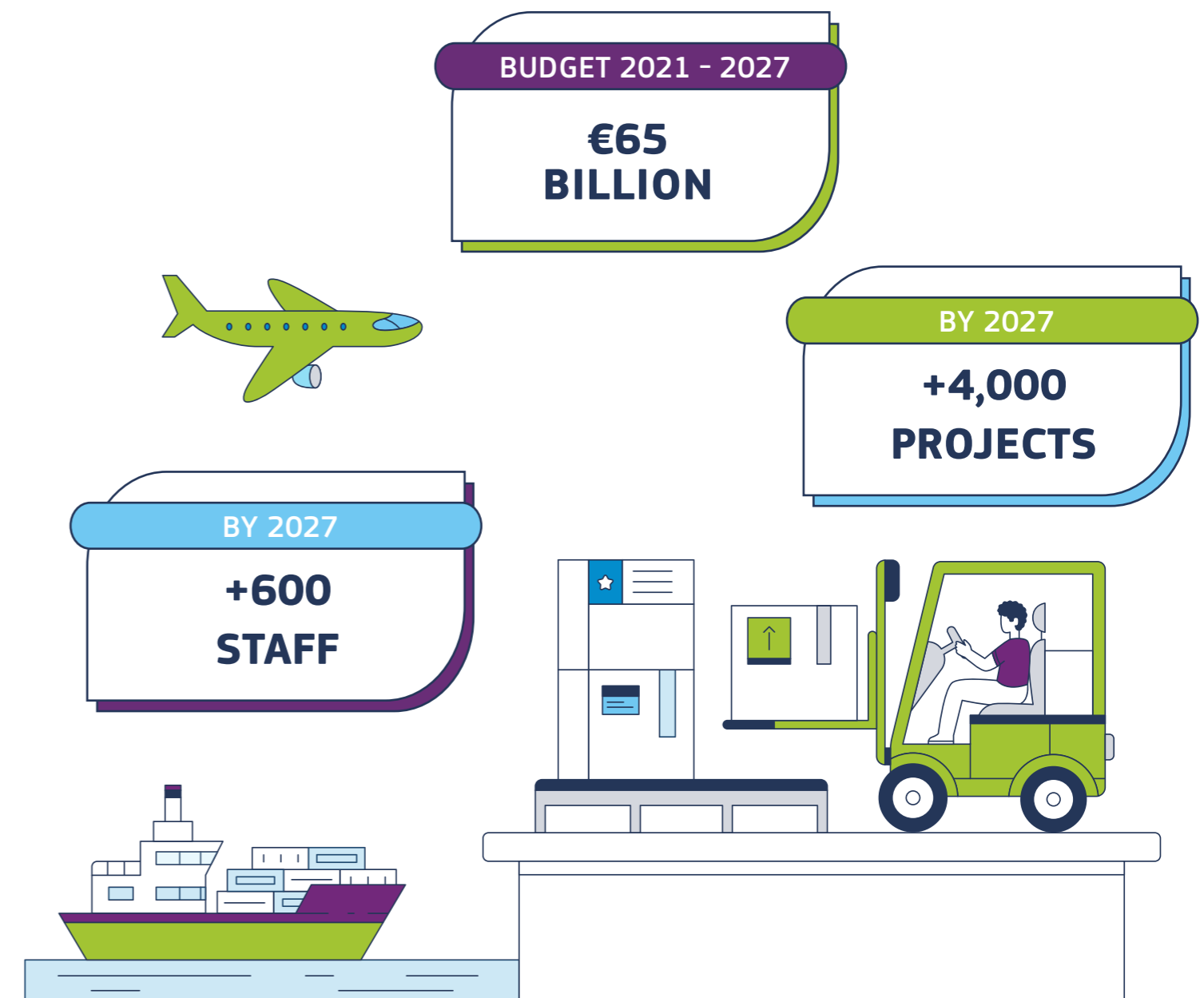
CINEA's long-standing experience in programme management provides the beneficiaries with:

- » Simplified access to EU funding opportunities
- » Promotion of project results and achievements for increased visibility of EU actions and promotion of the programmes
- » Guidance and technical support in project management, financial engineering, public procurement, and environmental legislation in close collaboration with beneficiaries
- » Streamlined and harmonised procedures for a better use of EU funds and maximised programme efficiency, such as shorter payment times and faster response rate
- » Efficient evaluation procedures, user friendly and transparent call documentation, and customised IT tools to support applicants.

## Supporting the European Commission

The Agency also supports policy makers and the European Commission by:

- » Providing feedback on programme implementation as input to policymaking
- » Developing synergies between programmes to bridge the gap between R&I results and infrastructure development
- » Bringing innovative ideas, concepts and products to implementation
- » Building significant economies of scale



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