FUNDACIÓN VALENCIAPORT

alice Alliance for Logistics Innovation through Collaboration in Europe

BOOSTLOG

Logistics Nodes Cloud Report

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Challenges

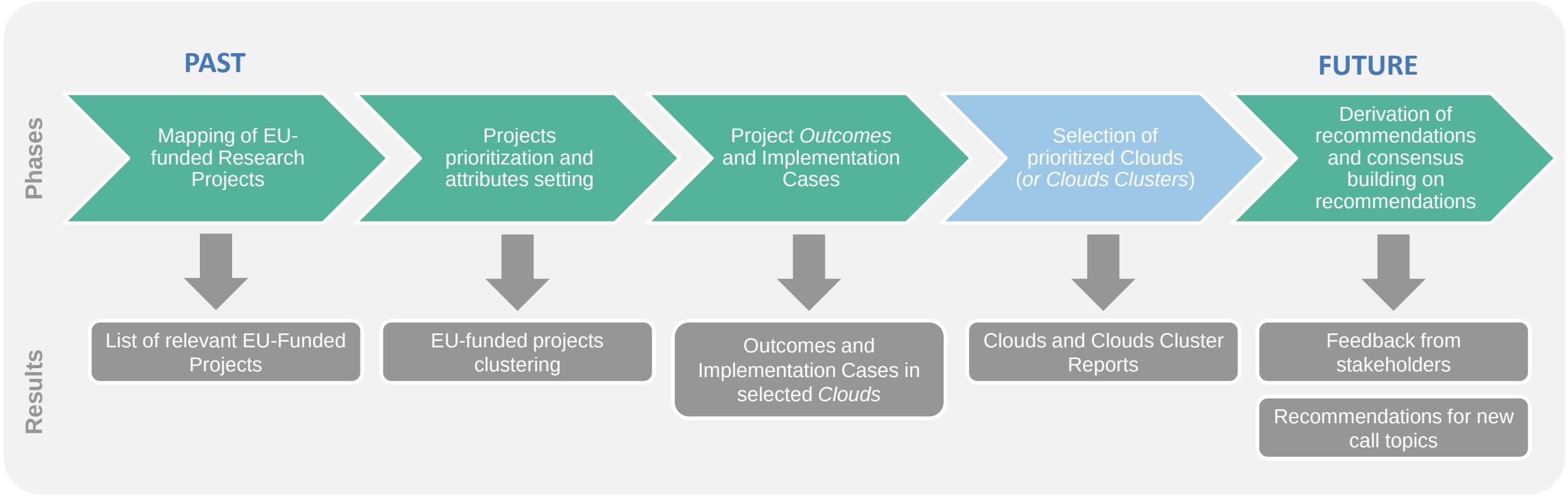
EU funded project results (including products, services and solutions) are difficult to find and valorize.

Regulation, market fragmentation and resistance to change are barriers that slow down the uptake of R&I results by companies and hinder impact generation.

Attribution of impact as a result of R&I projects and funding is challenging and not well communicated.

This project BOOSTLOG-Boosting impact generation from research and innovation on integrated freight transport and Logistics system has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No 101006902

BOOSTLOG Approach



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Scope of 3rd Cloud Report

Logistics Nodes are facilities characterised by their geographical strategic locations and by the infrastructures, assets and activities involved. They usually consist of large areas where both public authorities and business agents cooperate under co-competition schemas to facilitate and optimise transport and logistics operations along the supply chains.

Many R&I projects have enabled improvements of control and performance of various activities necessary for the transport of goods, including services, procedures from planning to performance, thus improving efficiency of not only logistics nodes but overall freight transport.

Maritime & River ports

Inland ports & hubs

Container depots

Intermodal terminals

Airports

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Mapped EU R&I projects on Logistics Nodes

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Logistics Nodes targeted impacts and implementation levels

TARGETED IMPACTS	NR. OF PROJECTS	ARCC	Chinos	Clusters 2.0	Cofastrans	Corealis	Docksthefuture	Ecohubs	Interface	Intermodel EU	PIXEL	RCMS	Smartset	Futuremed
Decrease of environmental and climate impact	11			POC	TD	POC	TD	POC	POC	POC	ISS	POC	POC	POC
Reduction of congestion on the road network	1			POC										
Modal shift	5			ND		POC	POC				POC	POC		
Decrease cost of transport & overall logistics	6	POC	POC		TD	ISS	TD				POC			
Increased transport reliability and responsiveness	2	POC	POC											
Increase management capacity of terminals and productivity	5				TD	ISS	POC				POC	POC		
Improved operations, terminal capacity utilization and efficiency in terminals	2		POC		TD									
Improve energy consumption	2		ND	POC									POC	
Improve the performance of the European Transport	3	POC		POC						POC				
Improve long distance-city distribution connectivity	1			POC										

6 Levels

- Not demonstrated (ND)
- Theoretical Demonstration (TD)
- Proof of Concept (PoC)
- Implemented Small Scale (including Niche Markets) (ISS)
- Implemented Medium Scale/Several Companies (IMS)
- Implemented Large Scale/Mainstream in Industry (ILS).

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Logistics Nodes projects expected impacts and KPIs

EXPECTED IMPACTS	KPIs	PROJECTS
Decrease of environmental impact	GHG emissions	CARGO ANTS, CLUSTERS 2.0, COFASTRANS, COREALIS, DOCKStheFUTURE, ECOHUBS, INTERFACE, INTERMODEL EU, PIXEL, RCMS, SMARTSET
	Local pollutants	PIXEL, RCMS
Reduction of congestion on the road network	Reduced vehicles movements / Nr. of vehicles	CLUSTERS 2.0
Modal shift	Efficient connections with other transport modes	CLUSTERS 2.0, COREALIS, DOCKStheFUTURE, PIXEL, RCMS
Decrease cost of transport & overall logistics	Fuel cost	CHINOS
	Cost/unit of transport	ARCC, COFASTRANS, COREALIS, DOCKStheFUTURE, PIXEL
Increased transport reliability and responsiveness	% On time	ARCC, CHINOS
Increase management capacity of terminals and productivity	Better capacity management with reduced costs	COFASTRANS, COREALIS, CHINOS, DOCKStheFUTURE, ECOHUBS, PIXEL, RCMS
Improved operations in terminals	Improve the operations	COFASTRANS, CHINOS, LOGIMATIC
Improved terminal capacity utilization and efficiency	Improve the efficiency	COFASTRANS, COREALIS, LOGIMATIC
Improve energy consumption	Energy consumption/unit of transport	CHINOS, CLUSTERS 2.0, SMARTSET
Improve the performance of the European Transport	Hyperconnected	ARCC, CHINOS
	Increase door to door	CHINOS
Improve long distance-city distribution connectivity	% Decrease in operational handling	CLUSTERS

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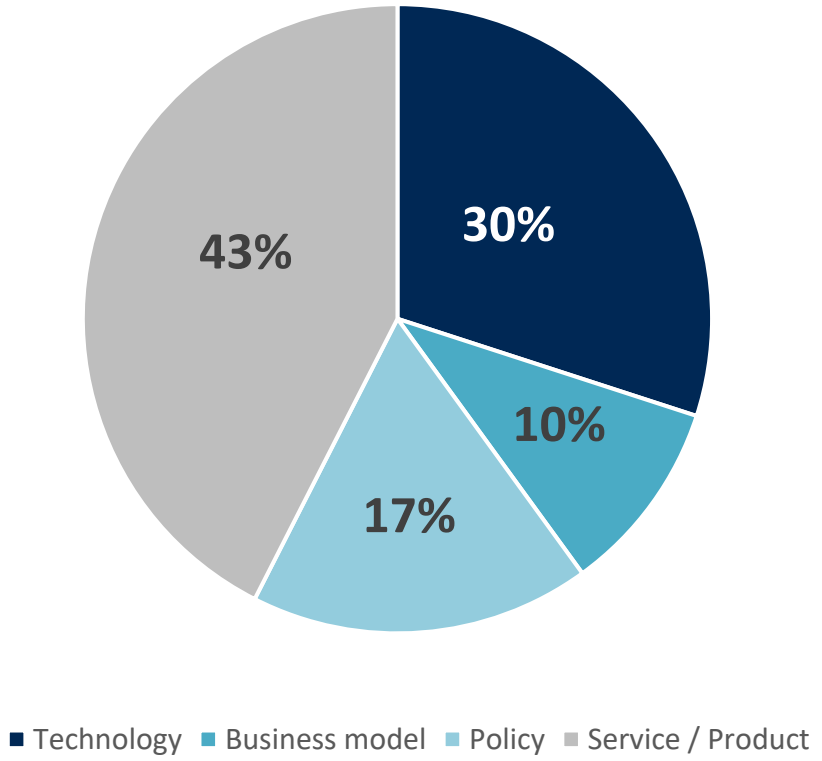
Main outcomes and organisations in LNs R&I projects

LOGISTICS NODES R&I PROJECTS OUTCOMES



ORGANIZATIONS WITH MOST PARTICIPANTS IN LOGISTICS NODES PROJECS SELECTED

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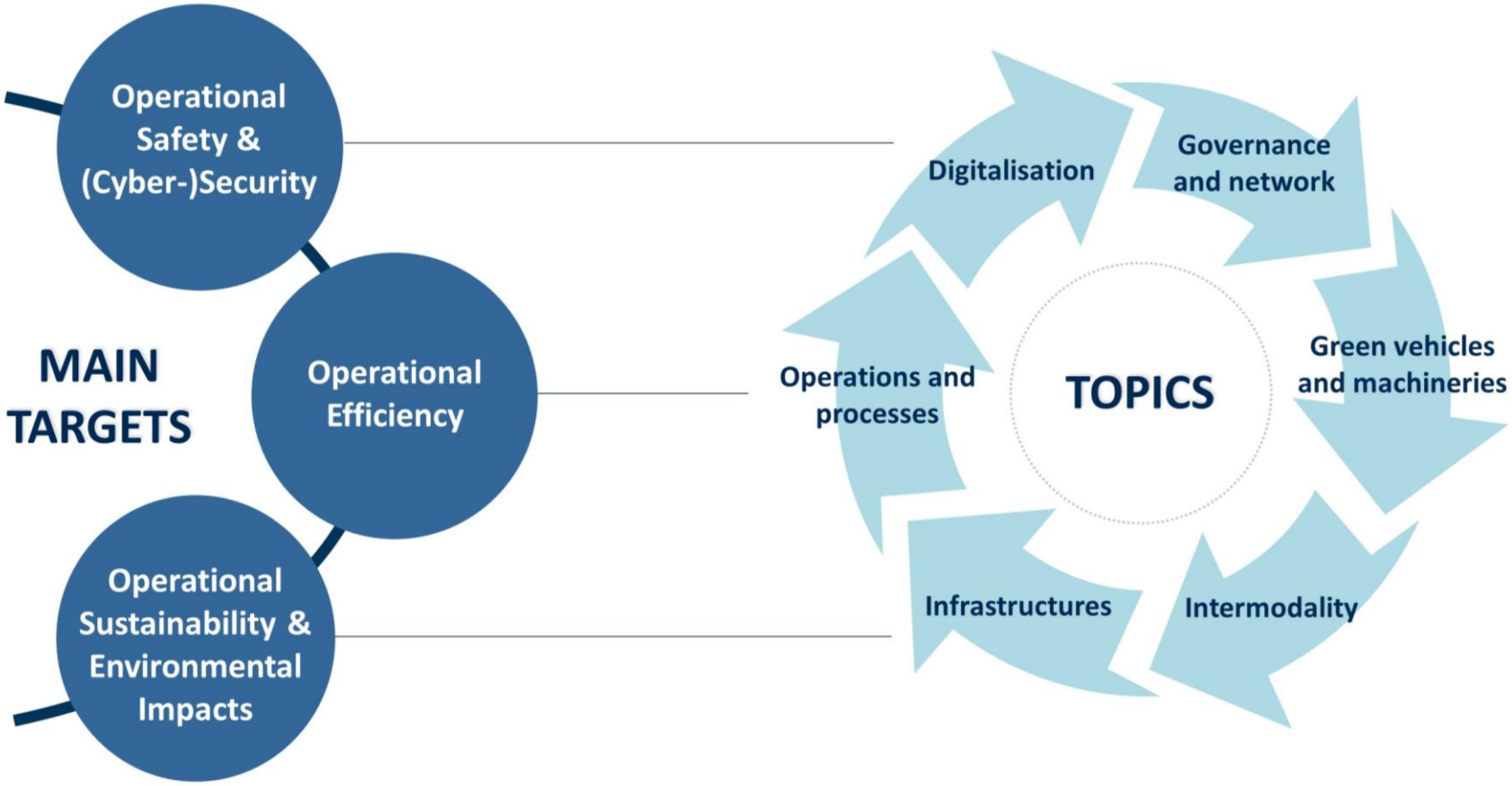
Core areas of intervention and topics to be addressed in LNs



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Barriers hindering more efficient and sustainable LNs

BARRIERS	DESCRIPTION	EXPECTED IMPACTS
Climate change risks	Atmospheric changes	Navigation zone, protection infrastructures, and manoeuvre area and berthing at ports, load/unload areas, cargo handling equipment, and hinterland connections
	Variations in other industry sectors, generating changes in the performance and operation of logistics nodes	• Changes in the types of vessels berthing at maritime or river ports leading to variations in the specifications of berthing or storage facilities; • A demand for more seasonal capacity; • A reduction in the volume of trade or a shift from export to import activities (or vice-versa).
	Modal shift to help reduces GHG emissions from road transport	Load and unload areas, cargo handling equipment, and hinterland connections.
Scepticism or lack of ability to invest in new solutions and technologies	The implementation of future innovations has been hindered by lacking a necessary prior basis, and also other activities such as the monitoring of tasks, machinery and load units	Digitalization is slowed down as well as aspects such as interoperability, data collection, aggregation and analysis, and the standardization of processes with it.
Plurality of participating organizations and the hardware used (infrastructures, vehicles and other assets)	The non-exchange of information on transport and the use of infrastructures hinders decision-making on the planning and coordination of operations and management of assets and infrastructures in logistics nodes, but also the standardization of processes	• Low collaboration between actors; • Less efficient operations and operations management.
High costs (time and money) to adapt the infrastructures	High costs (time and money) to adapt the infrastructures to the new trade and transportation trends and patterns as a barrier to entry to the market	Navigation zone, protection infrastructures, and manoeuvre area and berthing at ports, load/unload areas, cargo handling equipment, and hinterland connections
Increased operational problems related to the lack of capacity of the nodes	For example, the accumulation of empty containers or the lack of them hinders the operation of the nodes.	Situations of high congestion that lead to large queues and waits

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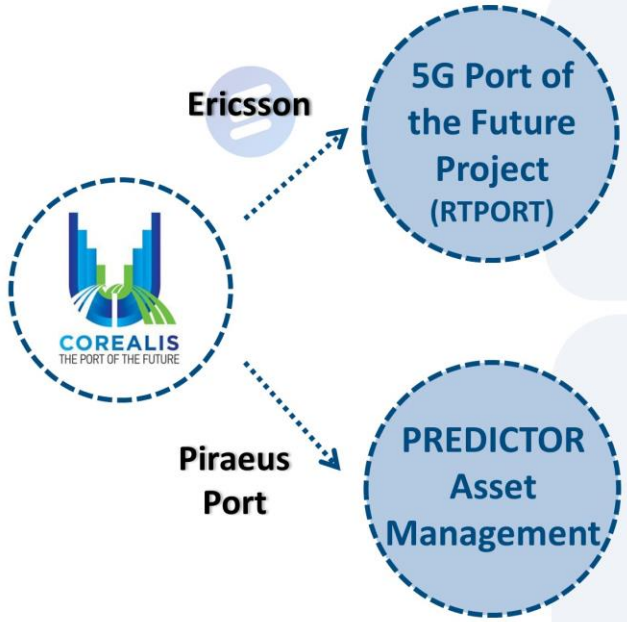

The project developed a Model-Driven Real-Time Control module to coordinate and support port operations in real time in order to improve its competitiveness with a better and faster handling of the general cargo.

The module was implemented by **Ericsson** in the port of Livorno, Italy.

Currently, Livorno's port still uses the system and Ericsson is still developing the technology to fully develop a commercial product called "5G Port of the Future Project".

In another of the multiple Living Labs of the project, specifically in the Port of Piraeus, the PREDICTOR Asset Management system was implemented.

This Predictive Maintenance (PdM) algorithm aims to predict maintenance for yard trucks in port terminals. Seeking to improve both economic and operational efficiencies, the port is able to minimize the inventory kept and it reduces the maintenance time for the trucks, minimizing breakdowns during operations.

The accuracy was around 85% and provided so many benefits that it is still kept in the **Piraeus Port** today.

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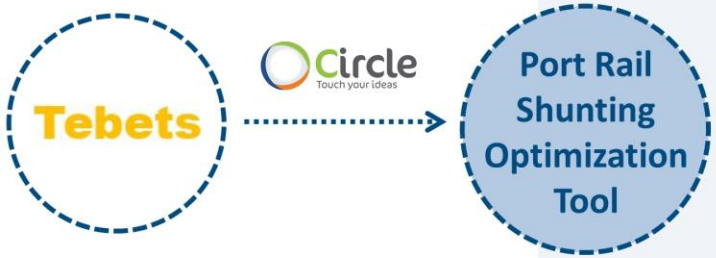
Implementation cases

Between the efforts made by PIXEL to create a framework of the ports of the future, they focused on reducing the impact on climate change and the environment of port activities.

To that end, the Port Environmental Index (PEI) was developed. This index help to assess and monitor the overall environmental impact of ports. It will enable inter-port comparisons in terms of environmental performance and bring awareness on how different port activities affect the environment.

The sensors for measurements and the index calculations are still used in the **Port of Piraeus**.



The Italian R&D project TEBETS laid the groundwork to later develop a Decision Support System tool. The objective is to help and support the planning and the management of rail shunting operations within the port area, involving the interaction between the rail stations and the maritime terminals.

Circle enabled the transfer of knowledge and facilitated the subsequent development: a digital platform consisting of a system composed by a Decision Support Systems Tool and a Digital Twin. This tool is composed by a Scheduling and a Re-scheduling model for managing unpredictable events. This tool is being tested in the Port of Genova.

Some of the efforts made in CLUSTERS 2.0 project culminated in the Slot Booking App. It is a web application that assists the operations of freight delivery and pick-up in airports. Its main impacts are the reduction of waiting and idle times (and therefore its costs), the optimization of personnel planning and the transparency and smoothness given to these processes.

The developer was the IT company **Nallian** and the implementation was made in the Brussels Airport. The implementation is still used via the BRUcloud platform by AirCargoBelgium.

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TRENDS AND SOCIETAL DRIVERS

ASPECTS THAT DETERMINE THE PATH AHEAD

- Low level of **involvement of** the **logistics nodes**
- **Innovation programmes are not alone** contributing to the improvement of Logistics Nodes.
- The **interest** of innovation projects in the Logistic Nodes is considerably **recent**.
- **Ongoing projects**.

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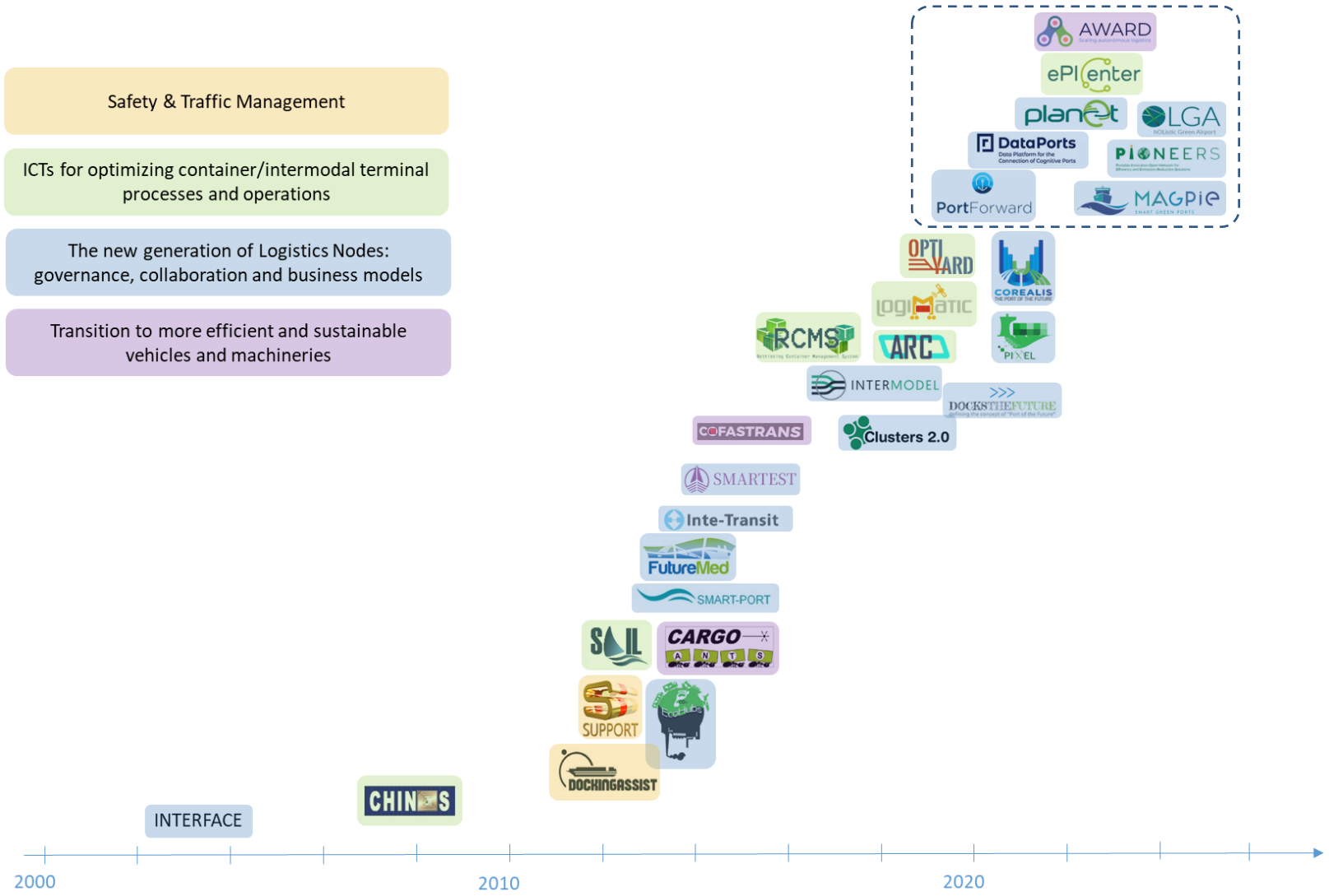
Ongoing projects



Regarding the main categories

- The number of projects addressing the **New generation of Logistics Nodes** has increased.
- **Safety** has become a secondary focus over time.
- There is a clear correlation between the **cloud of trends** and the side focus of the projects. Currently, ongoing projects dedicate a large part of their efforts to improve digitalization and sustainability.

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Thank you!

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https://www.etp-logistics.eu/boostlog/

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