Progress towards Federated Logistics through the Integration of TEN-T into A Global Trade Network

D5.1 Stakeholder Analysis Report

Document Summary Information

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Glossary of terms and abbreviations used

Abbreviation / Term	Description

1 Executive Summary

The PLANET project aims to overcome the challenges of assessing the impact of emerging global trade corridors on the TEN-T network and to ensure and effective integration of the European to the Global Network. PLANET goes beyond strategic transport studies, and ICT for transport research, by rigorously modelling, analysing, demonstrating & assessing their interactions and dynamics thus, providing a more realistic view of the emerging T&L environment.

The present document constitutes Deliverable D5.1: "Stakeholder Analysis Report" in the framework of the PLANET project.

WP5 – "Dissemination, Commercialisation, Policy recommendations" evolves all the activities related to ensuring sustainability of the project outputs and it will lead all the activities related to dissemination, communication and outreach as well the exploitation of the project results.

In general, WP5 will:

- Develop and implement a Communication and Dissemination plan, the backbone of the project branding and visibility amongst different stakeholders and communities
- Develop and implement strategies for commercializing the results of the project, with special attention to IP protection and policies recommendations
- Provide policy recommendations linking to impact assessment.

The main objective of T5.1 is to ensure stakeholders engagement throughout the entire duration of the PLANET project. As a solid foundation, **the stakeholder analysis** will identify important European stakeholders that are considered relevant for PLANET and will gather information used to mobilise these stakeholders to support the project's exploitation objectives.

A stakeholder analysis is a form of technological intelligence that aims at the identification of the main players in a specific market segment or value chain, their role and their contributions to a particular sector. For the PLANET project, the value chain considered involves Transport and Logistics actors including among others technology providers, hubs, logistics providers or shipping companies.

The secondary objective is to contribute to defining useful exploitation insights for project's results.

2 Introduction

2.1 Objective of this deliverable

The main specific objectives of this deliverable are:

- Assess and **define the relevant actors** in the Value Chain and Market connected to PLANET.
- Identify the value chain stakeholders, to find the best positioning for PLANET's innovative technologies and concepts in the transport and logistics sector, to **ensure the largest applicability of the concepts** beyond the project consortium.
- Define and build a stakeholder community to engage and **define the best communication and dissemination actions** and support the development of breakthrough innovative business models based on an exploratory business research and knowledge sharing and define a business plan for the project results.
- Ensure a large exploitation and market penetration for the PLANET innovative solutions and products and other relevant exploitable results from the project.

The approach will consist in identifying the most relevant industrial stakeholders as SMEs, large industries, European research and academic institutions working in R&D, innovation and business activities in correlation to the Transport and Logistics sectors of the PLANET value chain.

2.2 Mapping PLANET Outputs

Purpose of this section is to map PLANET's Grant Agreement commitments, both within the formal Deliverable and Task description, against the project's respective outputs and work performed.

Table 1: Adherence to PLANET's GA Deliverable & Tasks Descriptions

PLANET GA Component Title	PLANET GA Component Outline	Respective Document Chapter(s)	Justification
DELIVERABLE			
D5.1 Stakeholder Analysis Report	Stakeholder Analysis Report identifying the **concerns and needs** from all stakeholders relevant for PLANET.	Entire deliverable	Chapter 3 describes in detail the methodology and the main insights of the PLANET value chain, describes large stakeholders groups and Chapter 4 assess the most relevant messages that stakeholder groups would seek through PLANET in line with their pains and needs. This has been done thanks to project partners' inputs.
TASKS			
ST5.1.1 Stakeholder analysis	PNO will use WHEESBEE for this analysis - a Business Intelligence and Tech Mining tool aimed at supporting and stimulating the technological innovation processes of large enterprises, small and	Chapter 3.1	This chapter describes the scope of the analysis and the methodology proposed.

	medium sized companies, and research centers.		
	A systematic analysis will identify the most relevant stakeholders and their **needs and concerns** around the PLANET emerging technologies and the Integrated Green EU-Global T&L Networks.	Chapter 3.2	This chapter describes the scenario defined for performing the analysis. It includes: *i*) a description of the technologies considered within the PLANET project to digitalise the Transport and Logistics sector; *ii*) the value chain involved in the project; and *iii*) additional players that may be relevant such as regulator bodies.
		Chapter 3.3	This chapter is the main stakeholder analysis. It includes the positioning map of stakeholders and a summary of the top stakeholders.
		Chapter 4	Identification of needs and concerns from stakeholders groups
		Chapter 5	This chapter collects the conclusions of the analysis
		Chapter 6	This chapter collects the references used for the analysis

2.3 Deliverable Overview and Report Structure

This deliverable provides a detailed description of the methodology and the scope of the report. The methodology proposed by PNO is based on different data sources including online and proprietary search tools. However, the methodology starts from a definition of a set of keywords that is described in the document. Afterwards, the main stakeholders are identified, classified and mapped according to their capacities or expertise.

The deliverable is structured as follows:

- **Chapter 3** collects all the information related to the stakeholder analysis as such:
  - Chapter 3.1 describes the scope of the analysis and the methodology proposed.
  - Chapter 3.2 describes the scenario defined for performing the analysis. It includes: *i*) a description of the technologies considered within the PLANET project to digitalise the Transport and Logistics sector; *ii*) the value chain involved in the project; and *iii*) additional players that may be relevant like regulator bodies.
  - Chapter 3.3 is the main stakeholder analysis. It includes the positioning map of stakeholders and a summary of the top stakeholders.
- **Chapter 4** builds an assessment for understanding concerns and needs of stakeholders.
- **Chapter 5** collects the conclusions of the analysis.
- **Chapter 6** collects the references used for the analysis.
- Annex I provides the description of the identified projects that are related to PLANET.
- Annexes II and III provides the overall list of stakeholders identified.

- Annex IV provides the list of relevant patents.
- Annex V is a copy of the template that was used to collect inputs from project partners to evaluate stakeholders' concerns and needs.

This stakeholder analysis paves the way for the upcoming activities within WP5 towards the commercialisation plan that will be developed in later phases of the project.

3 PLANET Stakeholder Analysis

3.1 Methodology & Scope

3.1.1 Scope of the Stakeholder Analysis

This report and the stakeholder analysis as such aim to identify relevant parties from key targeted audiences related to the PLANET value chain. The identification of these parties will be a cornerstone for the upcoming activities of the project, as it will serve to:

- Identify the most relevant stakeholders around the PLANET emerging technologies.
- Build a contact list of the targeted audiences.
- Create a consultation network for the usability of the activities to be carried out during the project.

The following section describes the methodology that will be employed to perform this assessment.

3.1.2 Methodology of the stakeholder analysis

The stakeholders analysis is a form of (technological) intelligence that PNO performs with the aim of identifying the main players (with emphasis on industrial organisations) in a specific market segment or value chain, their role in that value chain, and their contribution to innovations, inventions or business in a particular sector.

The benefit of the stakeholder analysis to interested parties is that it provides them with a helicopter view on the most active stakeholders (mostly industry) related to a specific market segment for the purpose of:

- Finding potential partners for business collaborations.
- Identifying potentially interesting innovations to integrate in their products or innovation plans (open innovation).
- Spotting innovation trends, incumbent or dis-investing players and competitors.
- Market analysis and exploitation strategies.
- Determining the right communication management strategy.
- Explore the most vital issues for stakeholders to ensure the acceptance and uptake of the project results.
- Build relationships with the key stakeholders of the project to support the following development and implementation of a commercialization plan.

The overall aim is providing a comprehensive overview that supports in the latter PLANET activities finding the road to market as well as next possible exploitation routes. **The scoreboard used for such analysis entails both an original research in R&D funded projects and patent applications.** On one side, the analysis is intended to bring to the identification of industrial entities (large industries and SMEs) that may have an interest in PLANET-developed digital and connectivity technologies for the digitalization of all Transport and Logistics value chain. On the other hand, this research will allow to identify active universities, RTOs and associations in the research and development of new technologies related to PLANET technological framework.

The main outcomes will include:

- **Stakeholders Maps** per stakeholders category **and the positioning** of all the identified stakeholders **within a specific value chain segment**,
- **Ranking of the stakeholders** related to projects and IP
- **Market positioning of the stakeholders** in terms of their estimated capacity to deliver or use new technologies, as a metrics of their potential interest in the project outcomes

- A **list of most relevant organisations to select, monitor or engage** for the future project exploitation, providing the rationale behind.
- **Stakeholders Profile tables** providing relevant information about innovative projects, patents, or interest in the topic.

After a consortium validation, such organisations may be informed or interviewed in a tailored way about the progress of PLANET technologies and activities, with the aim to highlight the potential synergies and to generate more R&D or business opportunities within the industry/research groups in the consortium.

PLANET will also take into consideration the soon to be published "Roadmap towards the Physical Internet (PI)" that is being elaborated with the support of SENSE project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 769967. This roadmap will have an important impact on developments in the market and legislative framework of the PLANET Key Exploitable Results (KERs). This roadmap will sketch a path from now to 2040 with important milestones, required technologies and first implementation opportunities for the PI and it includes five key and complementary areas: The roadmap describes expected evolutions in Logistics Nodes, Logistics Networks and the Systems of Logistics Networks, that are in a "Generation 1" status today, to transform them in Physical Internet Nodes, Physical Internet Networks and the System of Logistics Networks. These three areas can develop independently generating near term benefits and complementary to these three areas are the access and adoption and governance. are addressed in the roadmap. Figure 1 includes a summary of the roadmap highlighting the planned development along the five main areas and their expected evolutions (here called generations) that are further described in Chapter 2[1].

Advanced pilot implementations of the Physical Internet concept are expected to be operational and common in industry practice by 2030, contributing to a 30 % reduction in congestion, emissions and energy consumption from the transport sector. The PLANET KERs are suitable to form part of these implementations.

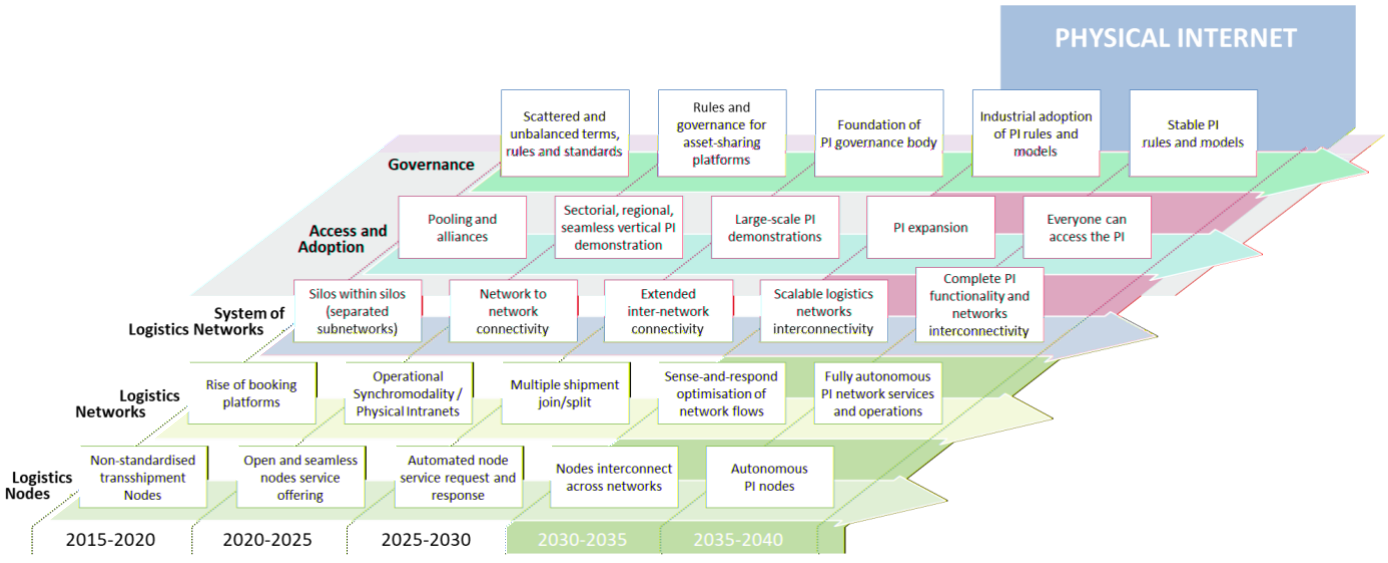

Figure 1: The Physical Internet matrix2

[1] The roadmap is also explained in a 6 min. video: https://www.youtube.com/watch?v=DD1z5PBe7Kk&t=46s

[2] Vertical networks in the meaning of company-internal logistics networks with suppliers and customers; Horizontal networks as system of different logistics networks linking resources and capabilities from different providers.

3.1.2.1 *Search for the Innovators (EU projects) and Investors (patent search)*

Spotting latest and/or most relevant EU projects in relation with PLANET is the first step in the research of stakeholders. They have been selected if characterized by a strong innovation character such as to provide a good insight into the latest trends and a look into the next future possible outcomes in the T&L sector, as far as public funding is concerned. Consistently, their consortia members will be referred to as the "innovators" to be classified and analysed.

For the purpose of this analysis all the stakeholders that are patenting their technologies and discoveries as "potential Investors" are considered, since patenting means money and efforts protect previous R&D. In this section of the SA document, PNO defined the profiles of potential investors belonging to the TRANSPORT and LOGISTICS sector.

These analyses were completed by exploiting mixed data sources based both on online and PNO's private search tools (e.g., www.wheesbee.com, Figure 2). Overall, R&D&I projects financed by the European Union or by other national grantor bodies from Italy, The Netherlands, Finland, Norway, Switzerland, UK, France, Germany, in a timeline (2013-today) have been explored. Most international programmes different from H2020 (or FP7 before it), such as LIFE or Interreg programmes schemes have been included as well. On the IP side, it was possible to gather information and data having complete access to approximately 60 million patents from a variety of international databases, including USA, Europe, Japan and China, from 1985 to date. The Patent Inspiration patent database counts more than 100M Patent Records and was used in order to double check the research analysis of the patents scouted through PNO's tool.

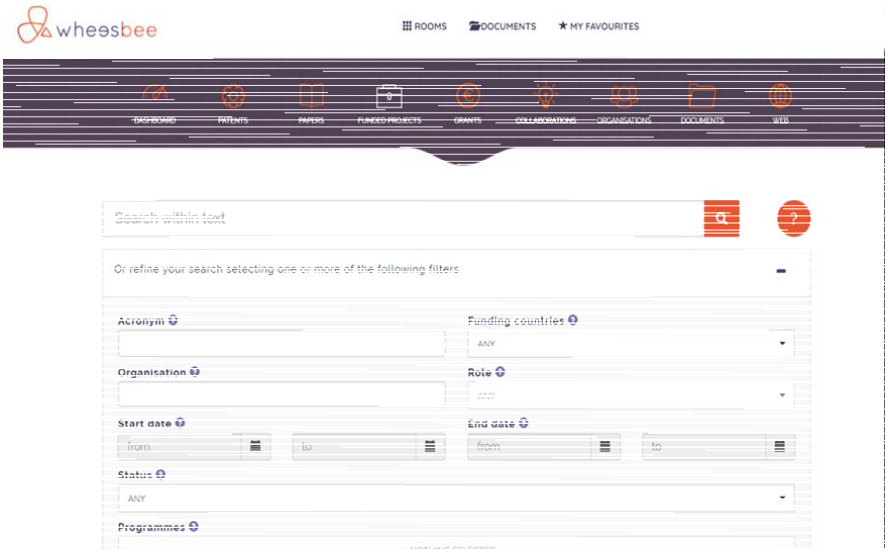

Figure 2: WheesBee Innovation Tool, funded Projects page

The starting point of the "innovators" selection consisted in the definition of a set of *keywords* to perform *queries*. The chosen keywords are most relevant, and they have been built incrementally over different levels of complexity: *i*) *coarse level*; *ii*) *middle level*, *iii*) *upper level.* They are shown in the table below.

Table 2: Set of Keywords for the T&L sector identified by PNO

TABLE OF KEYWORDS FOR THE PLANET PROJECT IDENTIFIED BY PNO
Action: Connecting, Networking, Improving, Increasing, Optimising, Data Sharing, Data Capture, Data Processing, Data Transmission, Handling, Managing, Control, Monitoring, Planning, Event-based Transmission, Tracking, Shipping, Synchromodal Modelling, Multimodal Modelling
Tool: IoT/Internet of Things, Blockchain, Autonomous Vehicles, Hyperloop, Smart Contract, Warehousing Automation, Cloud, ICT Infrastructure, 5G, Predictive Analytics, Prescriptive Analytics, Advanced Analytics, Machine Learning, Algorithm, Artificial Intelligence, Automation, Drone, Unmanned Aerial Vehicles, Smart Sensor, Big Data, Geographic Information System, Physical Internet, Digital Clone, Digital Twin
Object: Trade Corridor, Trade Route, Core Network Corridor, Emerging Corridor, TEN-T Network, TEN-T Route, TEN-T Corridor, Traffic Route, Traffic flow, Transport, Logistics, Urban Logistics, Logistics Network, Logistics Route, Transport Route, Transport Corridor, Transport Network, Rail/Railway Transport, Sea Transport, Road Transport, Freight Transport, Transport Infrastructure, Logistics Infrastructure, Corridor Infrastructure, Route Infrastructure, Freight, Commercial Nodes, Trade Nodes, Logistics Hub, Inland Waterways, Inland Hub, City Hub, Ports, Hubs, Transfer Zone, Terminal, Load Unit, Workflow, Container, Supply Chain
Property: Smart, Intelligent, Green, Integrated, Automated, Low-Emission Transport, Low-Emission Network, Interoperability, Safe, Secure, Real Time, Cognitive, Synchromodal, Multimodal, Cloud-based

The final queries were thus constructed by crosslinking the keywords to the scopes, goals and techniques used in the different production processes. They are listed in Table 3, together to the number of the results. The queries were applied to both project descriptions, results descriptions (where available) and titles.

For the R&D&I projects, the analysis started with a high-level search of European initiatives characterised by the same goals, scopes and alike technologies to PLANET in Transport and Logistics sector, in order to identify

Both **Similar Technologies/solutions** and **Similar scopes,** thus including:

- projects **dealing with transport and logistics** sector.
- projects that **used the technologies mentioned in the previous table** in T&L sector.
- projects **using technologies to digitalise and connect** the transport and logistics value chain.
- projects **committed to help the T&L sector to reduce emissions**.

In the following paragraphs the results obtained, by following the explained method will be presented and discussed. After the first rough lists were produced, they underwent a further funnel selection to satisfy at least one of the following aspects:

- Use of **digitalization and connectivity technology** in transport and logistics.
- Look for/or develop new technologies to **encourage a more sustainable** transport and logistics value chain (reduced emissions, reduced operation costs).
- **Improvement and optimization** of the TEN-T Network and Core Network Corridors.

The identification of the relevant corpus of patents required some fine-tuning by using more complex keywords and by coupling them for complex and detailed technical definitions in order to obtain more relevant results. Keywords related to objects (goods, goods, route, network and node) have been added to the first query. Finally, the patent analysis was aimed at the identification of all patents related to the shipment of goods or frights. For this reason, the keywords “ship and deliver” have been also added (see Table 4). The patents identified by using each string, were reviewed and chosen considering the technologies and the scopes object in PLANET. Further refinement was then applied building on the first results. Other set boundaries were the following: the publication date timeframe set from January 2013 to date and including patents protected in Europe; patents developed by foreigners’ company but having subsidiaries in Europe; identification of the CPC related to the

relevant patents (**B60**-Vehicles in general; **B61**-Railways; **B62**-Land vehicles for travelling otherwise than on rails; **B64**-Aircraft, aviation, cosmonautics; **B65G**-Transport or storage devices, e.g. conveyors for loading or tipping, shop conveyor systems or pneumatic tube conveyors; **B66**-Hoisting, lifting, hauling; **G01**-Measuring, Testing; **G05**-Controlling, regulating; **G06**-Computing, calculating, counting; **G08G**-Traffic control systems).

Table 3: Final queries used for the projects research on WheesBee.

QUERIES FOR PROJECTS RESEARCH	NUMBER OF RESULTING PROJECTS	NUMBER OF RELEVANT PROJECTS (PROJECTS CHOSEN FOR THE ANALYSIS)
transport AND logistics AND (blockchain OR iot OR "internet of things" OR "autonomous vehicles" OR "unmanned aerial vehicle" OR "smart contract" OR "physic internet" OR 5g OR "machine learning" OR "cloud-based")	74	23
"ten-t" AND transport AND logistics	15	11
(autonomous AND transport AND (sea OR road) AND (vessel OR ship OR cargo OR truck OR vehicles))	113	5
freight AND (transport OR logistic) AND (connecting OR improving OR optimising) AND (IoT OR "internet of things" OR "blockchain" OR "physical internet" OR "smart contract" OR "big data" OR "machine learning" OR "autonomous vehicles" OR 5g)	19	5
("sea transport" OR "multimodal transport" OR "green transport" OR "green logistics" OR "road transport") AND (connect OR planning) AND (ICT OR "big data" OR "autonomous vehicles" OR "machine learning" OR blockchain)	25	4
freight AND ("synchromodal transport" OR "multimodal transport") AND connect	8	4
freight AND (terminal OR hub OR ports) AND (monitoring OR control OR planning OR connect OR optimising OR improving OR increasing) AND (blockchain OR "physical internet" OR "IoT" OR "internet of things" OR "smart contract" OR "5g" OR "autonomous" OR "automated" OR "machine learning")	13	2
"corridor" AND (transport OR logistic) AND (monitoring OR control OR planning OR connect OR optimising OR improving OR increasing) AND (blockchain OR "physical internet" OR "IoT" OR "internet of things" OR "smart contract" OR "5g" OR "autonomous" OR "automated" OR "machine learning")	10	2
port AND hub AND IoT	4	2

(transport OR logistics) AND ("data sharing" OR "data processing" OR "data capture") AND (blockchain OR "physical internet" OR "IoT" OR "machine learning" OR "algorithm" OR "smart contract" OR "smart sensor")	53	2
"core network corridor"	2	2
(transport OR logistic) AND "hyperloop"	4	1
transport infrastructure" OR "logistics infrastructure" OR "corridor infrastructure") AND (monitoring OR control OR planning OR connect OR optimising OR improving OR increasing) AND (blockchain OR "physical internet" OR "IoT" OR "internet of things" OR "smart contract" OR "5g" OR "autonomous" OR "automated" OR "machine learning")	64	1
("traffic route" OR "logistics route" OR "transport route") AND (monitoring OR control OR planning OR connect OR optimising OR improving OR increasing) AND (blockchain OR "physical internet" OR "IoT" OR "internet of things" OR "smart contract" OR "5g" OR "autonomous" OR "automated" OR "machine learning")	10	1
freight AND intelligent AND handling AND automated vehicle	4	1
("trade corridor" OR "trade route" OR "commercial node" OR "trade node" OR "T&L" OR "transport and logistic" OR "freight transport") AND connecting AND (IoT OR "internet of things" OR "blockchain" OR "physical internet" OR "smart contract" OR "big data")	7	1

Table 4: Keywords combination steps for patent analysis

Funnel	Strings used for patents search	Number of patents worldwide	Number of patents per EU applicants
Funnel I	transport AND logistic AND (tracking OR monitor OR control OR planning OR connect OR "data sharing" OR improve OR optimise OR managing OR handling) AND ("artificial intelligence" OR "machine learning" OR algorithm OR cloud) AND (blockchain OR "internet of things" OR "big data" OR "5g" OR "smart contract" OR "physical internet" OR "unmanned aerial vehicle" OR drone OR autonomous OR hyperloop OR "digital twin" OR "digital clone")	4463	416
Funnel II	transport AND logistic AND (freight OR good) AND (tracking OR monitor OR control OR planning OR connect OR "data sharing" OR improve OR optimise OR managing OR handling) AND ("artificial intelligence" OR "machine learning" OR algorithm OR cloud) AND (blockchain OR "internet of things" OR "big data" OR "5g" OR "smart contract" OR "physical internet" OR "unmanned aerial vehicle" OR drone OR autonomous OR hyperloop OR "digital twin" OR "digital clone")	2233	281

Funnel III	transport AND logistic AND (freight OR good) AND (route OR node OR network) AND (tracking OR monitor OR control OR planning OR connect OR "data sharing" OR improve OR optimise OR managing OR handling) AND ("artificial intelligence" OR "machine learning" OR algorithm OR cloud) AND (blockchain OR "internet of things" OR "big data" OR "5g" OR "smart contract" OR "physical internet" OR "unmanned aerial vehicle" OR drone OR autonomous OR hyperloop OR "digital twin" OR "digital clone")	2157	263
Funnel IV	transport AND logistic AND (freight OR goods) AND (route OR node OR network) AND (ship OR deliver) AND (tracking OR monitor OR control OR planning OR connect OR "data sharing" OR improve OR optimise OR managing OR handling) AND ("artificial intelligence" OR "machine learning" OR algorithm OR cloud) AND (blockchain OR "internet of things" OR "big data" OR "5g" OR "smart contract" OR "physical internet" OR "unmanned aerial vehicle" OR drone OR autonomous OR hyperloop OR "digital twin" OR "digital clone")	1690	192

The words marked in red in table 3 indicate the keywords that have been used to narrow the analysis field between the different funnels.

3.1.2.2 *Stakeholders Positioning Map*

Both Innovators and Investors are grouped together, in order to classify the ranked stakeholders according to their "Market Positioning". The purpose is to identify their potential *Investing Capacity* (PNO has fine-tuned a mixed of relevant data and indicators, *investing capacity* is an index that combines turnover, multinationalism, the availability of a Corporate Venture and other similar variables) and their readiness on similar technologies respect to the project (*Innovation Vision*). This defines their positioning as potential "Market Entrants", other than on the "Technology Expert" side. This approach/definition mimics some adopted in Patent analysis literature[3], but completely refresh the metrics and the analysis mix including R&D&I.

POTENTIAL MARKET ENTRANTS:

possibly have a high *Investing Capacity* but are lacking the R&D focus on the project matter and thus they don't have availability of ready or quasi-ready technology. Therefore, they may want to challenge the market leaders (incumbents) but may need the Technology Providers to do it. On a pure IP level, this makes them ideal licensing candidates. On a R&D perspective, they could be the right partners to scale-up projects results. instead are a step forward. They can be interpreted as owners of alternatives to the technology under analysis, since they are at the top of both the Investing and Innovation capacity. Frequently, they are market leaders. It is not expected to find many when exploring new technology not yet market-ready

TECHNOLOGY EXPERTS:

have high Innovation capacity and affinity to the project R&D topics. In principle, they may be needed by potential market entrants. Aside, so called are also considered. These are a mix of organisation that are not at the core of the topic but can be important for some small segments and portions of the relevant market. Furthermore, they could be supporting partners.

3.2 Transport & Logistics Scenario

3.2.1 Involved Technologies

PLANET project considers several technologies to digitalise the Transport and Logistics sector. In this section a brief description for the main considered technologies is done. The selection criteria of the technologies listed

[3] E.g. for IP analysis in the patent search sof. patent search sof.

are closely related to PLANET's concepts (i.e., LL1 focused on testing new solutions such as IoT, big data, blockchain, artificial intelligence for PI optimised door-to-door Asia-Europe corridors; LL2 focused on application of synchromodality supported by blockchain and advanced IoT; LL3 focused on testing of IoT and big data analytics for reliable, transparent and fully connected corridor) or with relevant sectorial trends.

- **Big Data**: Big data is a field that treats ways to analyse, systematically extract information from, or otherwise deal with data sets that are too large or complex to be dealt with by traditional data-processing application software. Within T&L processes, Big Data are collected, analysed and used to support new business models and T&L services according to the physical internet paradigm. Big data are used for the creation of advanced transport and logistics services such as route optimisation or warehousing as a service and for collaboration with suppliers.
- **Physical Internet:** The Physical Internet is a vision of how physical objects might be moved via a set of processes, procedures, systems and mechanisms from an origin point to a desired destination in a manner analogous to how the Internet moves packets of information from a host computer to another host computer. In transportation, the Physical Internet refers to the combination of digital transportation networks that are deploying to replace analog road networks. In logistics, the Physical Internet is an open global logistics system founded on physical, digital, and operational interconnectivity, through encapsulation, interfaces and protocols. The Physical Internet is intended to replace current logistical models.
- **IoT:** The Internet of things (IoT) describes the network of physical objects—"things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet. In T&L processes, the IoT enables greater automation in operational management through the acquisition, processing and automated transmission of localised, event-based data through the use of smart sensors and other ICT technologies.
- **Blockchain:** It is a growing list of records, called blocks, that are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data (generally represented as a Merkle tree). By design, a blockchain is resistant to modification of the data. It is an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. For use as a distributed ledger, a blockchain is typically managed by a peer-to-peer network collectively adhering to a protocol for inter-node communication and validating new blocks. Once recorded, the data in any given block cannot be altered retroactively without alteration of all subsequent blocks, which requires consensus of the network majority. In the T&L process, Blockchain technology is used to improve the security of transactions and the traceability of cargo trade flows across borders. It is not meant to replace advanced physical technologies, but to serve as a decentralised distributed ledger that administers the data transaction and authentication of goods and services across borders.
- **Machine Learning and Artificial Intelligence:** Machine learning (ML) is the study of computer algorithms that improve automatically through experience. It is seen as a subset of artificial intelligence (AI). Machine learning algorithms build a mathematical model based on sample data, known as training data, in order to make predictions or decisions without being explicitly programmed to do so. Within T&L processes, the application of intelligent algorithms (based on AI machine-learning) can help to obtain a detailed assessment of the impact of route changes of large ocean-going container ships on terminal operations, taking into account the necessary rescheduling of shipments for inland transport, and improve forecasting and planning of warehouse operations.
- **Autonomous Vehicles/Autonomous driving Systems:** Autonomous driving technologies allow vehicles to perceive their surroundings and move safely with little or no human intervention through a combination of sensors, cameras, radar and AI. In T&L processes, autonomous driving technologies are used to improve safety in transport and loading/unloading operations, to increase efficiency and reduce environmental impact.

- **Unmanned Aerial Vehicles (UAVs)/Drones:** An unmanned aerial vehicle (UAV) is an aerial vehicle without a human pilot on board. In T&L processes, the use of drones allows faster delivery, monitoring of operations and a sustainable impact on the environment.
- **5G:** 5G is the fifth generation technology standard for broadband cellular networks. All 5G wireless devices in a cell are connected to the Internet and telephone network by radio waves through a local antenna in the cell. The main advantage of the new networks is that they will have greater bandwidth, giving higher download speeds. 5G technology has the potential to provide greater visibility and control over transport systems. Low latency, high capacity and reliability will improve the way goods and people travel. The application of 5G in logistics operations will enable faster data flow and will help, together with AI and IoT, to help connected logistics and the supply chain to become fully visible in real time.
- **Hyperloop:** The Hyperloop is a proposed mode of passenger and freight transportation. Hyperloop is a sealed tube or system of tubes with low air pressure through which a pod may travel substantially free of air resistance or friction.
- **Smart Contracts:** A smart contract is a computer program or a transaction protocol which is intended to automatically execute, control or document legally relevant events and actions according to the terms of a contract or an agreement. In T&L processes, smart contracts help to improve and automate business operations. They simplify and protect many of the processes in the logistics industry, including agreement terms, fraud protection, record keeping, payments, cash flow. They also save money as they eliminate the need for third party processors. Through the use of smart contracts, shipments can be tracked from start to finish.
- **Cloud Computing:** Cloud computing is a paradigm for the provision of services offered on demand by a supplier to an end customer over the Internet (such as storage, processing or data transmission), starting from a set of pre-existing resources, configurable and remotely available in the form of a distributed architecture. In transport, cloud computing enables the sharing on the local network and in real time of information relating to vehicle diagnostics, the load of goods being transported, the number of passengers, to improve the flow of information in the industry by enabling stakeholders to store more data on the fleet. In transport, cloud computing enables the sharing on the local network and in real time of information relating to vehicle diagnostics, the load of goods being transported, the number of passengers, to improve the flow of information in the industry by enabling stakeholders to store more data on the fleet. In logistics Cloud and SaaS solutions connect multiple partners along the supply chain. This provides real-time visibility and monitoring of logistics processes and data.

3.2.2 Involved Value Chain

This section describes the actors involved in the Transport and Logistics value chain. This differentiation will allow the identification of the main stakeholders related to the PLANET project. The relationship between these segments and the PLANET consortium is also described below. However, some of these partners could play multiple roles or groups and some are valid representatives of a whole sector.

- **Technology Provider/Developer**: Companies, Universities, Standardization Organisations and Research Centres that develop and provide the technologies mentioned in the previous section in the transport and logistics sector.
  This segment is represented in the consortium by the following partners: INLE, CERTH, CATS, KNT, EBOS, EUR, HARDT, IBM, ITA, ILIM, NGS, SIR, PAN, VLT, WI, GS1 China, GS1 Poland.
- **Hubs and Ports**: Maritime and Inland Ports, railway, airport and road Terminals where freights are exchanged between vehicles.
  This segment is represented in the consortium by the following partners: CPSI, FV, ZLC, PoR, PP.
- **Infrastructure Service Provider:** Private or Public company that manages the transport infrastructures, providing services within it (e.g. maintenance) such as tugs in ports.
  This segment is represented in the consortium by the following partners: EGTC, HP, UIRR, NEWO.

- **Shipper:** Company that organise and manages all aspects of the shipment. Shipper can be both Consignor and Freight Forwarder. The consignor is the company sending a shipment to be delivered whether by land, sea or air. The Freight Forwarder is a professional figure in the field of transport, specifically in that of goods. It is mainly a work of organisation, in fact one of its definitions is transport architect. His main task is to evade a client's need to transfer materials purchased or sold, often to and from abroad, helping him to evade all the necessary customs and tax formalities and to find the most suitable means of transport.
  This segment is represented in the consortium by the following partners: ESC.
- **Logistics Service Provider:** A company that provides logistics services within transport hubs (e.g. who loads / sorts the containers on the ship, train or truck).
  This segment is represented in the consortium by the following partners: DHL, CLN, RS, PP, GS1 China, GS1 Poland, JD, RS.
- **Shipping Company:** Company that transports goods from one point to another and is responsible for them during transport.
  This segment is represented in the consortium by the following partners: COS, COSTech.
- **Fleet Owner:** Company that owns the fleet of transport vehicles. In this case it can be either companies that transport goods or companies that supply their vehicles to transport companies.
  This segment could be represented horizontally by other partners.

Figure 3 shows the value chain that this stakeholder analysis is based upon. It puts the technology provider/developer at the beginning of the value chain and the Hubs and Ports, Shipping companies, the Shippers and the Logistics Service Providers (LSPs) as the potential uptake users of the same. The fleet owners and infrastructure service providers are the secondary users of the technologies.

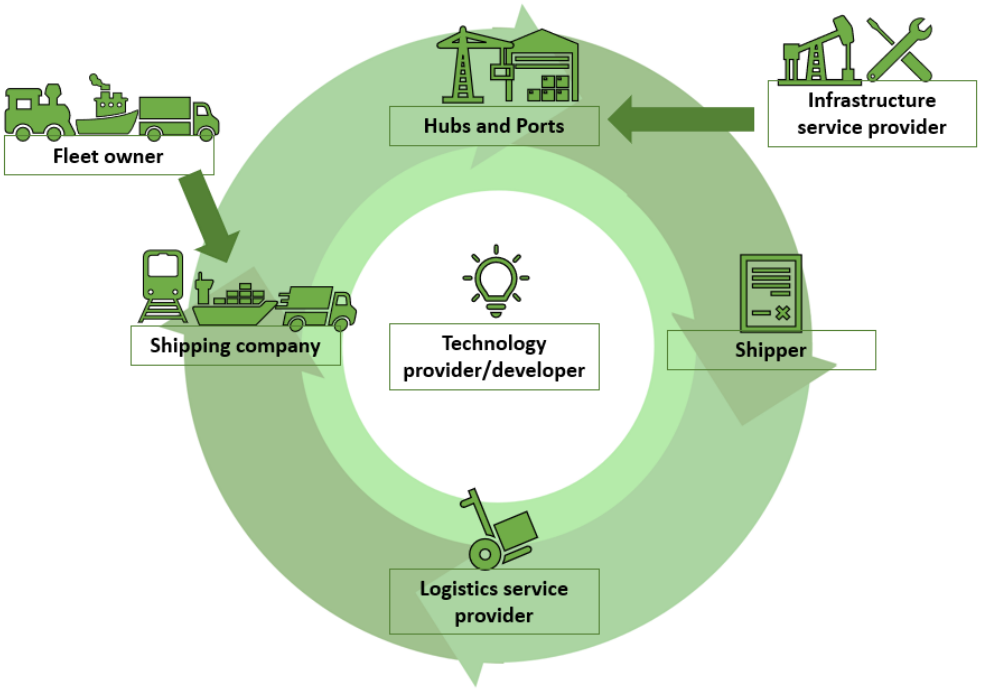

Figure 3: T&L Value Chain

The Value Chain represent the global flows that are covered by the three PLANET LLs and provides a clear perspective of all the actors involved or that may be relevant for its future development or deployment.

3.2.3 Other involved players

Besides the actors described previously which participated actively to the T&L value chain, there are other players which can have a high influence on the sector. These players are described below.

- **Member States:** In this group of stakeholders are included States, Regions and municipalities.
- **Regulator:** Government bodies exercising authority over certain activities in the transport and logistics sector such as ministries and municipal/regional councils and other types of public body with a policy-oriented entity.
- **ICT and Liability Companies:** Companies providing insurance and legal services related to the transport and logistics sector.
- **Sector Association:** Organisation that brings together companies and other stakeholders in the transport and logistics sector with the aim of promoting and developing business and the T&L sector.

3.3 Transport & Logistics Stakeholder Analysis

3.3.1 Identified industrial "innovators" and their position in the T&L value chain

The goal of this section is to identify the main organisations participating to funded projects in EU that could have an interest and a correlation with the PLANET goal. From a high level research analysis in the T&L sector, 67 projects were identified by running the set of queries reported in Table 3 and by setting the boundaries listed in page 13.

3.3.1.1 *Top funded countries and Top funding schemes*

These projects were analysed in order to get an overview for as regards the involved participants. This helped in mapping Europe in terms of active participation and thus market and technology relevance. In the maps below it is possible to see the number of times a country was involved in the scouted projects (both EU and national, (Figure 4a), and the number of project participants per home country (Figure 4b).

As a result, **Germany is ranked as the top country both in terms of projects participation as well as in number of involved organisations**, having participated to 30 funded projects with in total 108 participants. Germany is then **followed by Italy** with 26 projects, **Belgium and UK** with 22 projects. For as regards the project participants

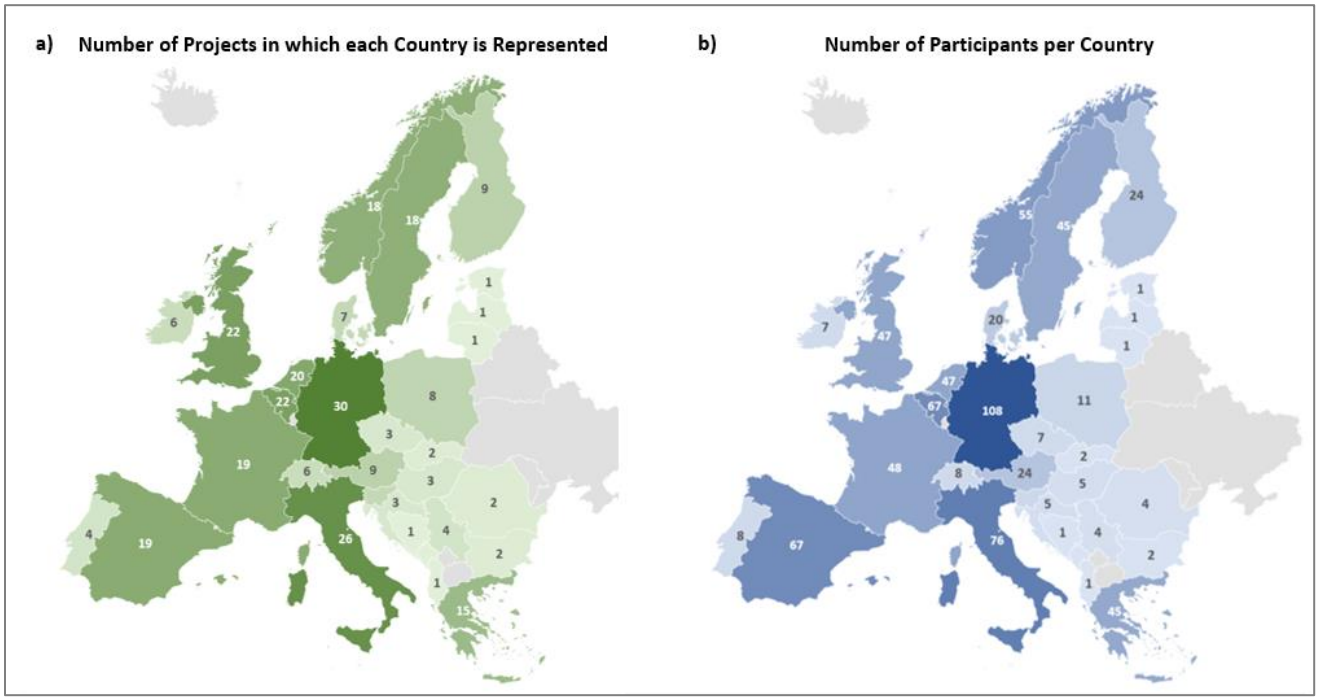

Figure 4: a) Number of projects in which each country is represented. b) Number of participants per home country.

The total funding per year leveraged from the identified projects is reported in Figure 5. These projects have been organised considering the funding programme and the year start in order to give an idea of the thematic that received more funding in the T&L sector. From a further economic analysis of these projects, the total money amount leveraged within the chosen timeframe, shows that in 2016 was leveraged the highest funding amount with almost 60 M€ destinated to 14 projects.

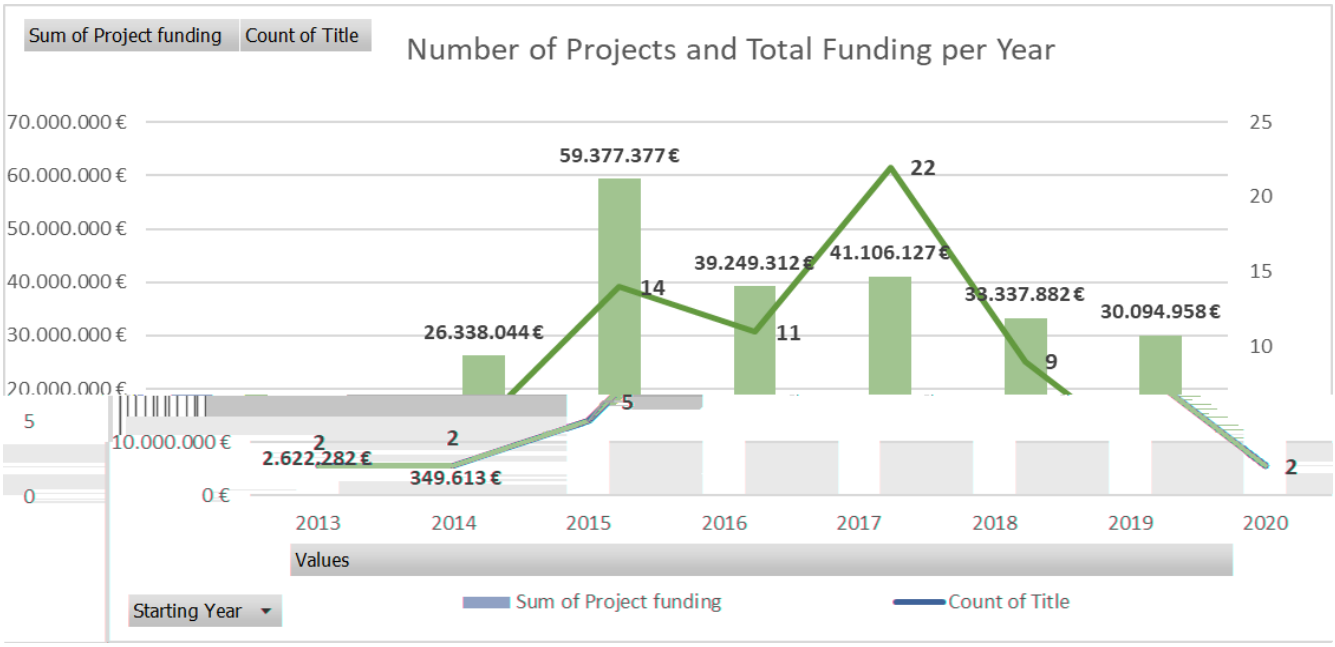

Figure 5: Number of Projects and Total Funding per Year

In the following graph, the 67 collected projects, are organised by type of grants, funding bodies and total funding amount. From these results, lower TRL (Technology Readiness Level) Research & Innovation Actions (RIA) projects obtained the highest funding amount with more than 111 M€ leveraged from the EU H2020 programme,

indicating an extremely high interest and evident trend regarding new technologies and more sustainable solutions for the improvement of digitalisation in T&L sector.

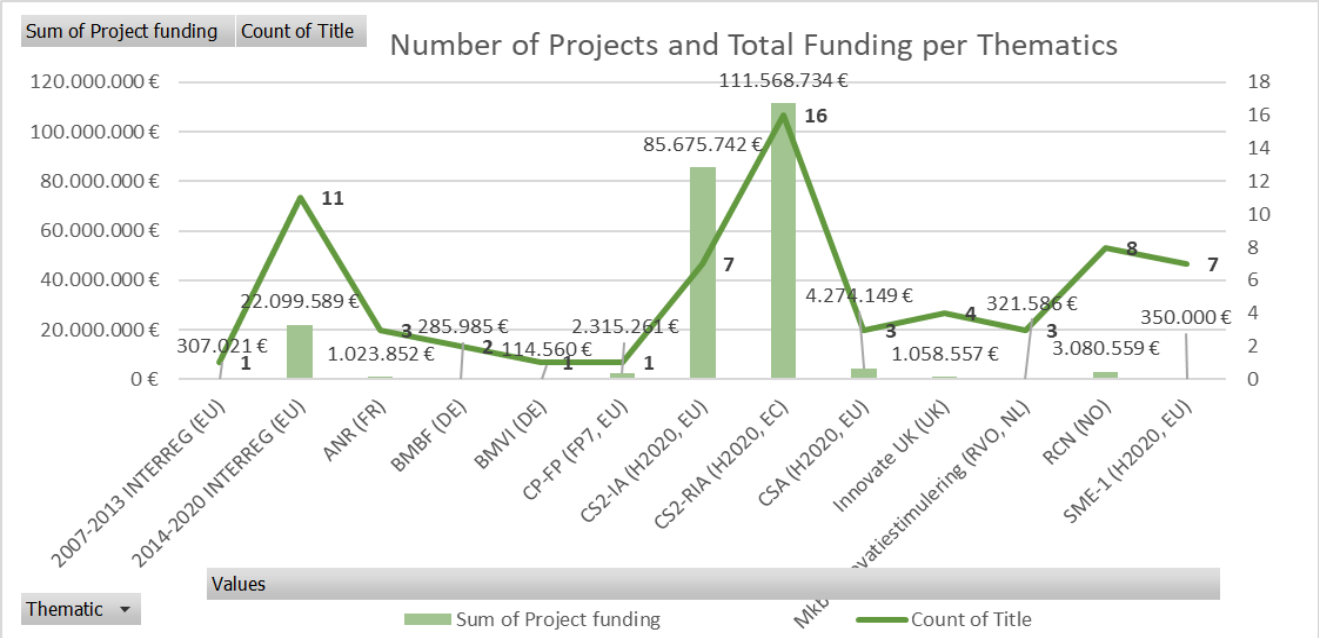

Figure 6: Number of Projects and total Funding per Programme scheme

3.3.1.2 *Stakeholders mapping*

The selected projects are described and summarised in the pages, collecting a short description of the project objectives, coordinators and project participants. Overall, they involved 757 different organizations, split into Large Companies, SMEs, Research Centres, Universities, Associations, Public Bodies, Hubs and Ports and Municipalities or Regions. It was then evaluated whether these organisations belonged to the transport and logistics value chain, as the players mentioned in 3.2.2 and 3.2.3 paragraphs. From the total number of organizations present in the selected projects, a total of 396 organizations can be considered possible stakeholders of PLANET considering their relationship for the further development or deployment of the solutions developed.

- : Technology provider/developer, Hubs and Ports, Infrastructure service provider, Shipper, Logistics service provider, Shipping company, Fleet owner
- *:* Member state, Regulator, Sector association, TIC and Liability company.

Considering that some stakeholders might belong to more than one value-chain sector or side service, the radar shown in the figure below has been built for the 67 extracted projects.
The highest number of participants organisations belong to the **Technology provider and/or developer** category (207 organisations). This result testifies to the importance of connectivity and digitisation technologies within the transport and logistics sector. Technology providers/developers are then followed by **Hubs and Ports** and **Shipping company** categories which are the fulcrum of logistics processes, with 40 selected participants.

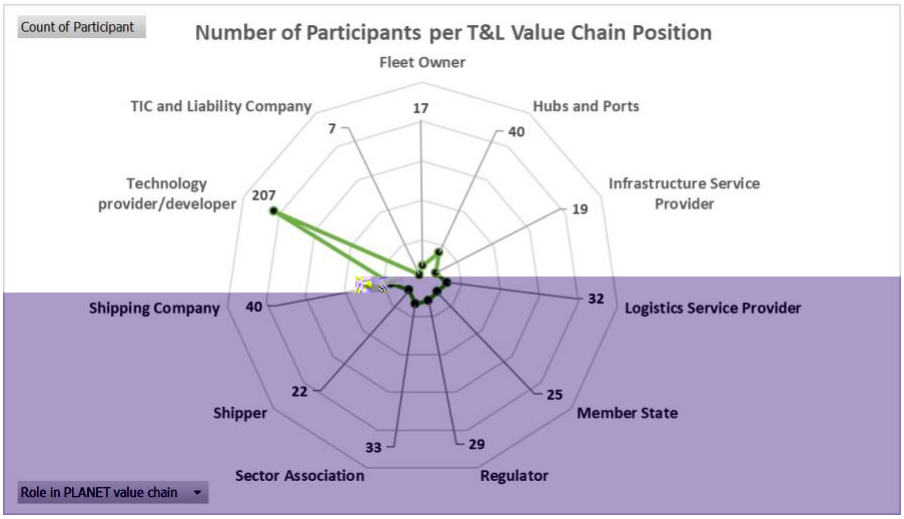

Figure 7: Number of Participants in each Position of the T&L Value Chain

After having classified the potential stakeholders in the value chain sectors, these are organised in the following map per country-of-origin, in order to get an overview of the European cement market. Germany, with 84 stakeholders, is the T&L market leading country, followed by Norway, with 48 organisations and Italy and Spain with 47.

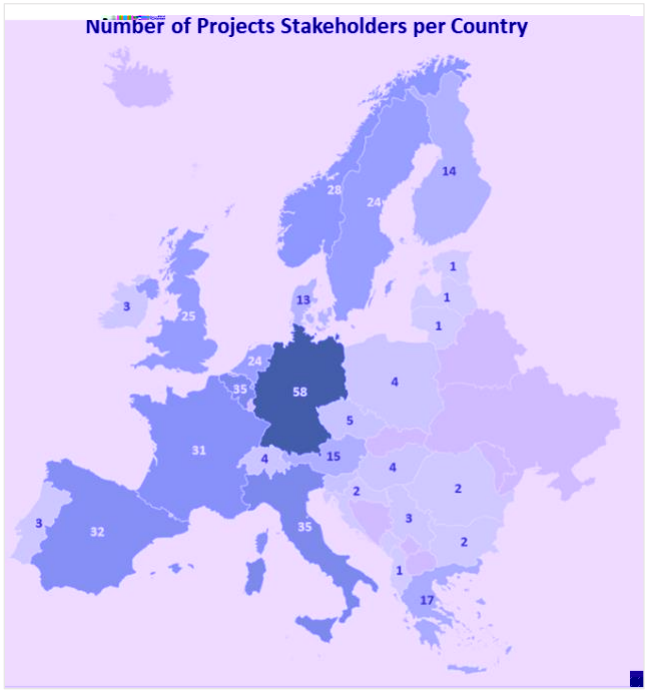

Figure 8: Number of projects Stakeholders per Country

In **ANNEX I** the list and description of the 67 selected projects, whilst all possible PLANET stakeholders extracted from the analysed projects are shown in the **ANNEX II**. Their role in T&L value chain is highlighted considering the same classification of the radar graph represented in the figure 7.

At this point, an additional criterion for the selection of the most relevant organisations consisted in the identification of the number of participations in the selected projects for each organisation listed in the previous table. In the figures below, indeed, all the possible stakeholders, represented by their activity, with more participations are listed.

Kongsberg AS resulted the most active company in the overall T&L field, indeed among the 67 selected projects is partner in 8 of them, followed by other two technology developers as SINTEF and the Institute of Communications and Computer Systems with 6 participations for each of them. Among the technology users, category which includes infrastructure service providers, shippers, logistics service providers and shipping companies, **DHL** participated 4 times, whilst the most active hub/port is the **Port of Hamburg Marketing**, also with 4 participations. Finally, among the entities which influence the T&L sector (member states, regulators and sector associations), the most active organisations are **ERTICO – ITS Europe** and **Swedish Maritime Administration** with 4 participations for each of them.

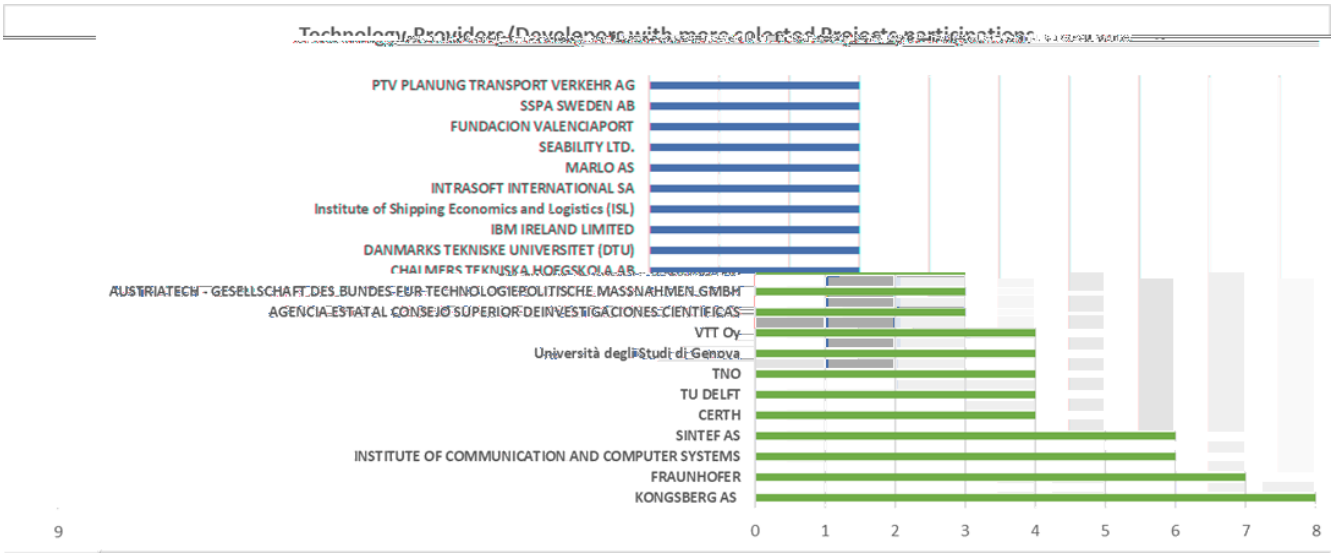

Figure 9: Technology providers/developers with more selected projects participations

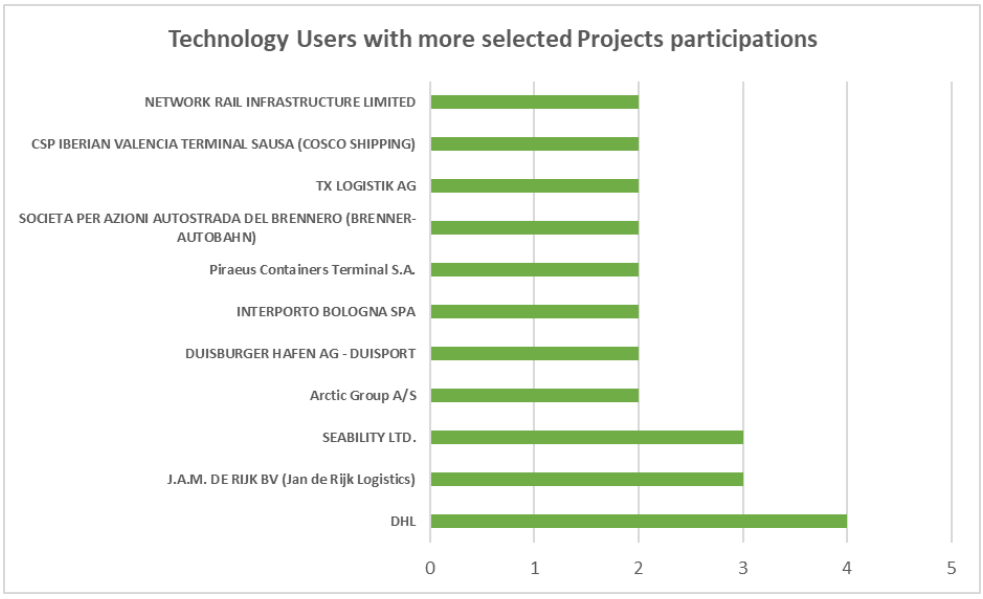

Figure 10: Technology Users with more selected projects participations

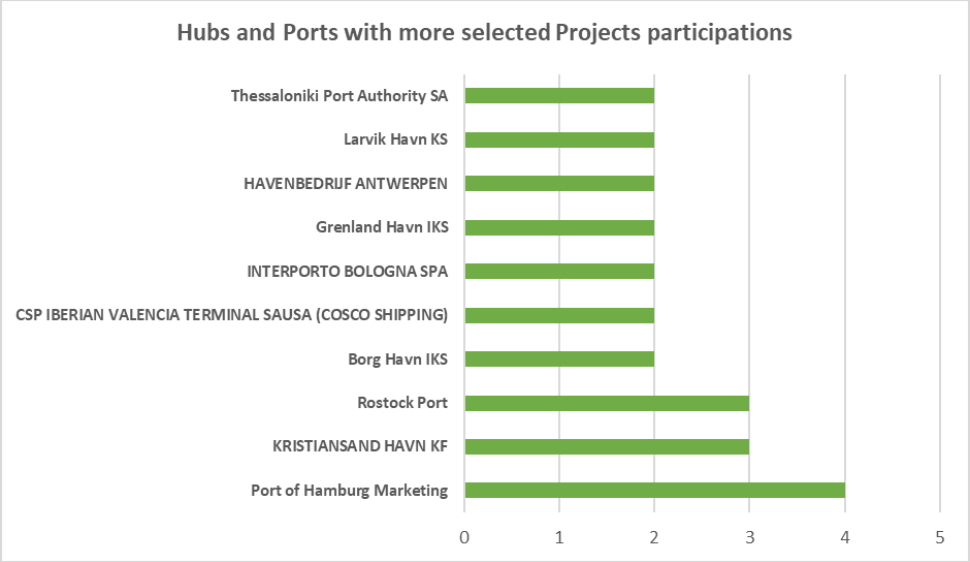

Figure 11: Hubs and Ports with more selected projects participations

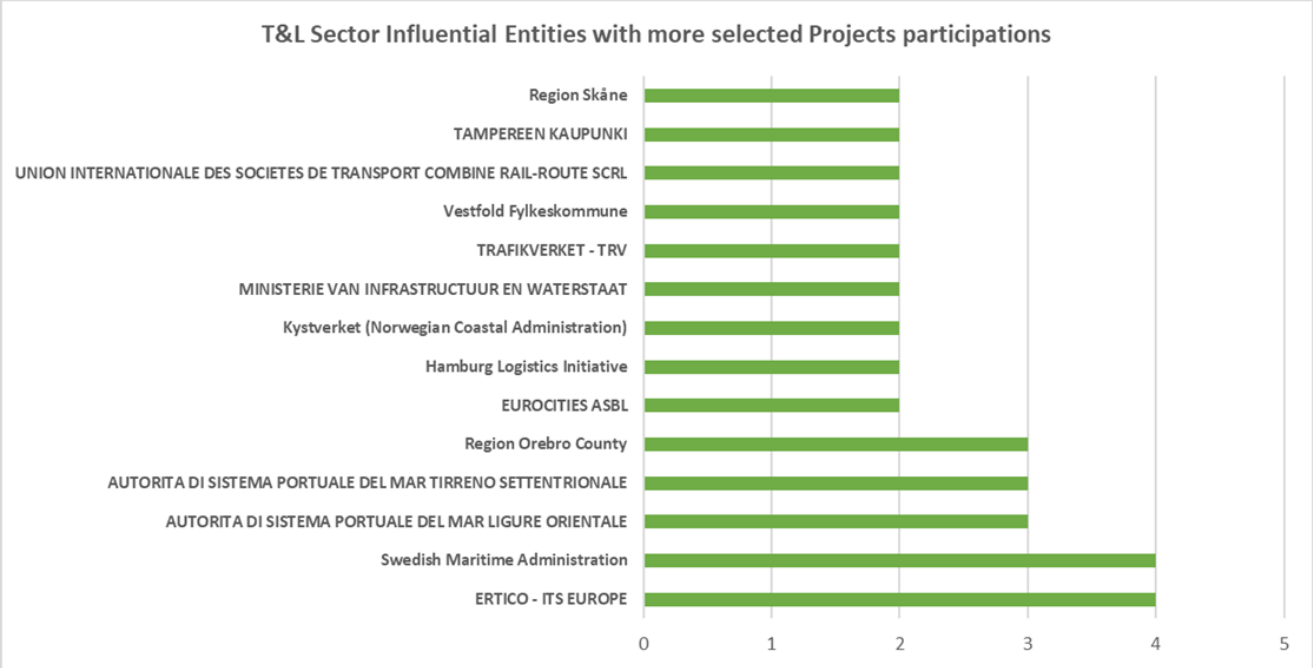

Figure 12: T&L Sector Influential Entities with more selected projects participations

3.3.2 Identified "investors" and their position in the T&L value chain

Following the patent "investors" methodology explained in the previous chapter, the results of the patents research related to the T&L sector resulted in **192 patents** belonging to EU companies. To narrow the field and identify the stakeholders closest to the PLANET, PNO used as starting point the first part of the last combination of keywords (transport AND logistics AND (freight OR goods) AND (route OR node OR network) AND (ship OR deliver)) present in the Table 4 (Funnel lV) and step-by-step specific tools and actions that are specified in PLANET have been added and allowed PNO to do a more targeted research and extrapolate the most interesting patents.

Such analysis brought to the following results:

- **19 patents were collected**: 10 belong to large companies, 7 to SMEs and 2 to Start-ups.

- **17 of the 19 patents belong to technology providers,** which represent the main category of stakeholders in terms of investment capacity and number of patents published in the sector. This is a matter of course as those who patents usually do so to protect their own technology and it is therefore rare to find technology users among those who file a patent.
- **31% of the scouted patents exploit artificial intelligence or machine learning technologies**, 26% concerns blockchain and smart contracts, 21% speak about autonomous vehicles and finally, the remaining part deal with the use of IoT, smart sensors, algorithm, and big data.

The scouted patents can be found on Annex IV.

3.3.2.1 *Applicants mapping*

The applicants of the above listed patents are distributed per country of origin in the following map (Figure 13). In this case, **Germany results at the first place with 8 patents and is followed by Finland with 3**. Germany, similar to the project analysis results, represents the most advanced country for as regards the innovation technology in the Transport and Logistics sector.

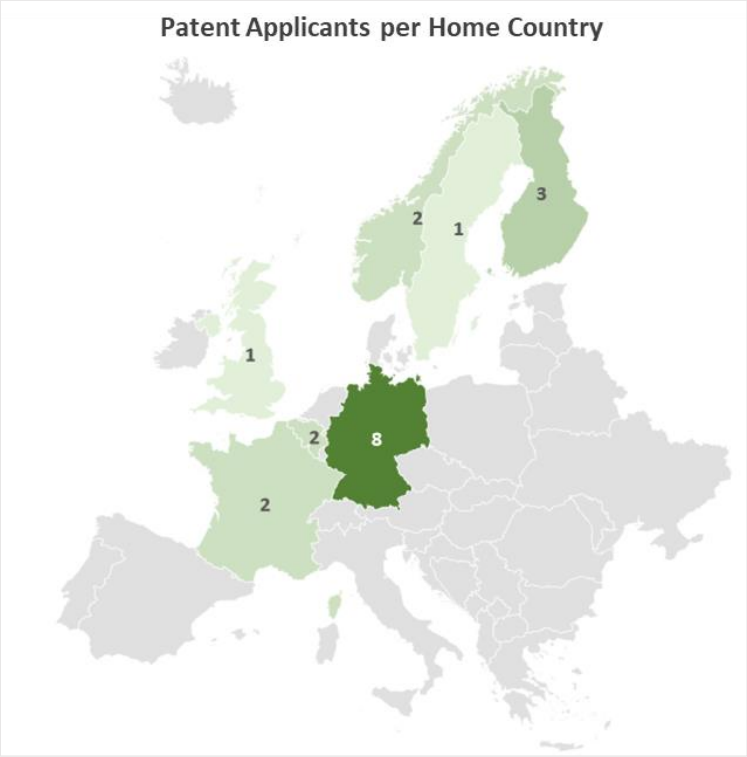

Figure 13: Patent Applicants per Country

As it has been done for the projects selection analysis, also for the patents study, the identified investors were classified in relation to the correspondent value chain positions and are represented in the radar graph in Figure 14. As in the project analysis, the highest number is represented by Technology providers/developer with 17 stakeholders on a total of 19. Only Deutsche Post DHL and Deutsche Bahn, among the applicants extracted, can cover the steps which use the technologies mentioned.

Figure 14: Number of Investors T&L Value Chain Position

The following Figure 15 shows the number of patents belonging to each applicant of the T&L sector. **The companies with the highest number of patents are Deutsche Post DHL and Nokia (41), Ericsson (39), Robert Bosch GmbH (23) and Volkswagen AG with 18 patents.**

The same patent applicants were analysed in terms of turnover of the correspondent large or SME companies. As one can expect, this graph is in line with the previous results since the companies that have collected the highest number of patents are also the ones with the highest turnover.

The applicants' position in the value chain is highlighted in **ANNEX III**, by reporting the same classification considered for the radar graph.

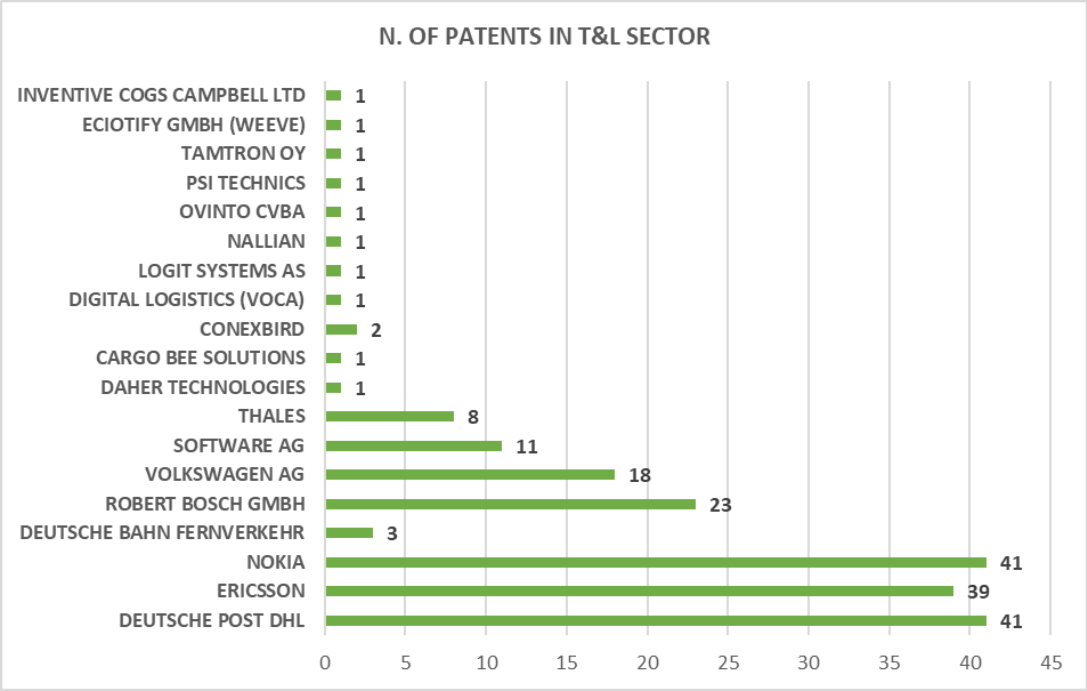

Figure 15: Number of patents in T&L sector per applicant

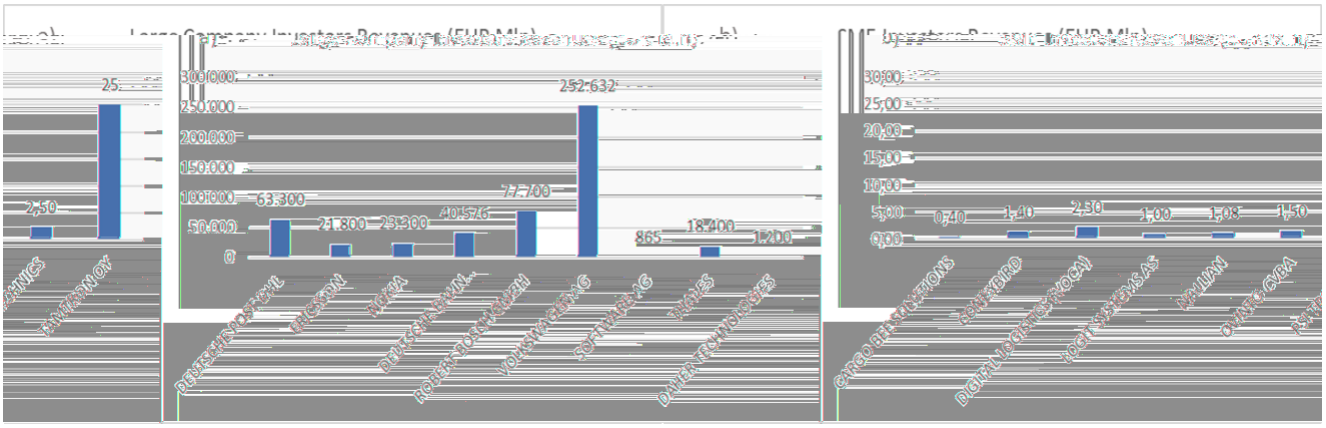

Figure 16: Applicants revenues

Once collected all information regarding the investors incomes and published relevant patents, the potential "investors" and future stakeholders were ranked for PLANET project exploitation. A score has been assigned using specific criteria reported in the table below. A premium was considered from larger companies, larger patents portfolios and from technology users.

Table 5: Ranking of stakeholders

RANKING FACTORS OF STAKEHOLDERS					
Type of Investor	*Start-ups*	*SME*	*Large Company*		
Type of Stakeholder in the value chain	*Technology user*				
Number of Patents	*1 <range< 5*	*6 <range< 10*	*11<range< 15*	*16<range< 30*	*>30*

The result of this ranking score is reported in a numerically anonymous way in the following histogram Figure 17. In line with the previous results, Deutsche Post DHL, Ericsson and Nokia occupy the first three places.

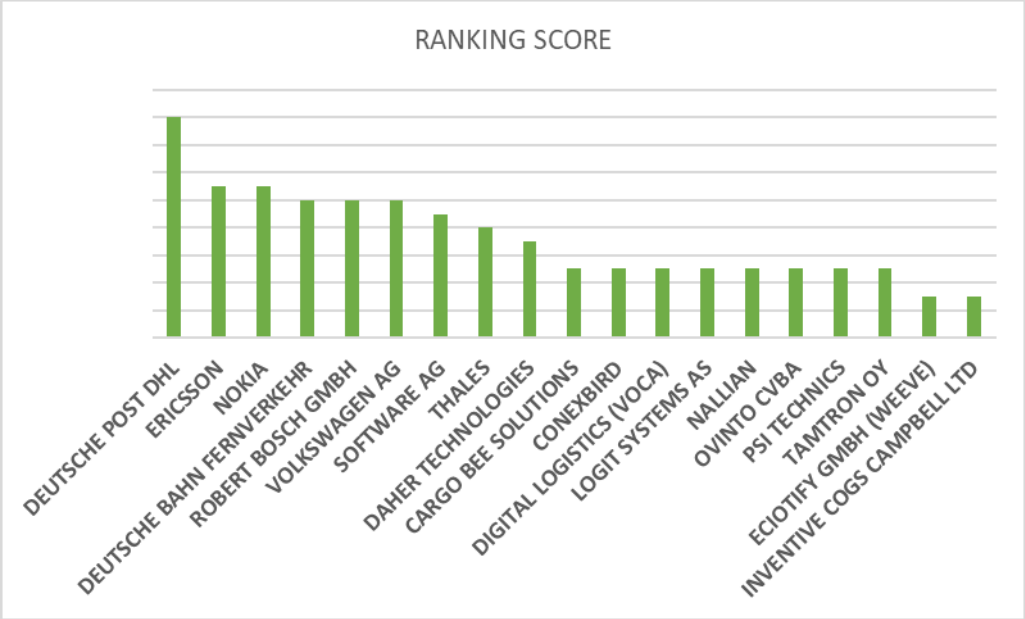

Figure 17: Ranking scores of the identified investors

Among the investors represented in the previous figure, only Deutsche Post DHL and Deutsche Bahn are the stakeholders which cover the steps of the value chain that use the digital and connectivity technologies. In particular: **Deutsche Post DHL** covers the Shipper, Logistics service provider, Shipping company and Fleet owner positions; **Deutsche Bahn** covers the Logistics Service provider, Shipping company and Fleet owner positions. All other investors are technology provider/developer.

3.3.3 Stakeholder Market Positioning Map

In this chapter the Stakeholder analyses done in the previous paragraphs is completed to try to identify the *stakeholders market position* (Buyer Vs Technology Provider) as described in

From the total possible Stakeholders reported in **ANNEX II** and **III**, top Stakeholders were chosen, based on the following criteria:

- Organisations that have published relevant patents (see Table 11) and at the same time also participated in one or more relevant projects (see Annex I);
- Organisations which by type of Stakeholders identified (see Figure 9, Figure 10 and Figure 11) have participated in the largest number of selected projects;
- More interesting organizations that cover multiple positions within the T&L value chain;
- PLANET partners who have participated in more than one project (DHL, Cosco Shipping, Inlecom Group, Ebos Technologies, IBM Ireland and Fundacion Valenciaport);
- Finally, DHL and Deutsche Post AG have been considered the same company because Deutsche Post acquired DHL in 2004 and today operates with the name Deutsche Post DHL Group.

In the following, the (Figure 18) for the Transport and Logistics sector is presented. Finally, a final suggestion for *top stakeholders* is reported in the form of description tables for each suggested organisation, in the Section 3.3.4.

The Maps are assembled by defining two axes in a quantitative way.

- – This considers turnovers, multinationalism, the availability of a Corporate Venture and other similar variables.
- – This especially considers the *Affinity* of the R&D and IP to the specific project technology at the centre of the analysis (e.g. blockchain and machine learning for Transport and Logistics).

This information is turned into a numerical score enabling a graphical representation. → **The Upper-left quadrant represents the High-potential interested parties or buyers, upper-right should include market leaders, lower-right the potential technology providers and lower-left potential followers/entrants.**

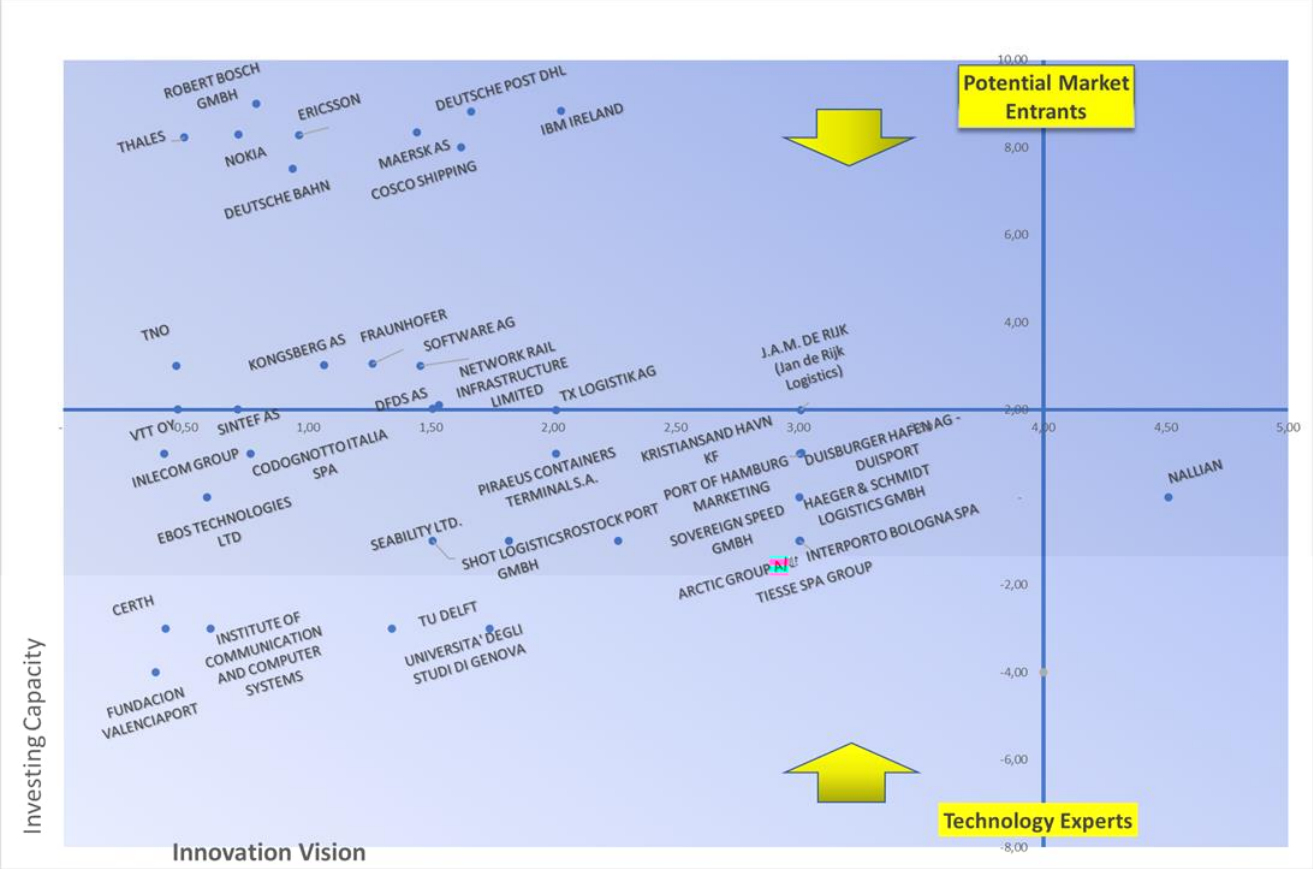

Figure 18: PLANET T&L Market Positioning Map

Summary Analysis:

The T&L landscape embraces different industries, transport modes and applications. Digitisation and connection technologies play a fundamental role horizontally.

- - The resulting map shows **large technology providers that are investing** (top-left area). For this reason, they appear in the *Interested parties or Buyers category* including large companies with high investment capacity such as **IBM Ireland** (partner of PLANET), **Thales**, **Robert Bosch GmbH**, **Nokia** and **Ericsson.** Notably, in this category it is also noticeable that large companies that are active end-users and that can play a leading role in the transport and logistics sector, such as the partners of PLANET **Cosco Shipping** and **Deutsche Post DHL**, and the large companies **Maersk AS** and **Deutsche Bahn**.
- -The trend above is confirmed by spotting freight companies and other logistics service providers currently positioned on the (horizontal) border line, since they could invest more in the coming years, following the current frontrunners. These include **TX Logistik AG**, **DFDS AS**, **Network Rail**

Infrastructure and **Jan de Rijk Logistics**. Notably, the latter has the largest score in terms of innovation capacity among all freight transport and logistic services companies in this analysis.

- - The landscape is also crowded with specialised excellence research centres like **Fraunhofer** and **TNO**. Both of them have a Corporate Venture.
- - a relevant "exotic" position as **Technology expert** is held by **NALLIAN**, Belgian provider of an open ecosystem of collaborative apps underpinned by a next-generation data sharing platform for logistics hubs. NALLIAN has an high affinity since has been participated in two projects in the sector, of which one relevant, and has published one patent in the sector which is also relevant. To date, NALLIAN has collaborated with more interesting stakeholders in the T&L value chain, among which **DHL**, **Duisburger Hafen AG**, **Citydepot**, **Heathrow Airport**, **Innovatrain AG**, **Interporto Bologna Spa**, **Jan de Rijk Logistics**, **Piraeus Containers Terminal S.A.**, **Seability Ltd**. and **Trelleborgs Hamn AB**.

These highlighted results will be also referred during the assessment of next section to identify the main needs and concerns of the two main stakeholder groups from this analysis: *investors* and *innovators*. By coopering with PLANET partners (that are indeed part of the relevant stakeholders list as reflected above) it will be possible to analyse what are the links and the interests that could be promoted during PLANET exploitation and communication activities.

3.3.4 Top Stakeholder Suggestion and Description Tables

Company information	**NAME: THALES** **TYPE: Large Industry** **COUNTRY: France** **WEBSITE: https://www.thalesgroup.com/en**
Value chain position	Technology provider/developer
Estimated Market position/Strength	Interested Party/Buyer
General description	It is a leader in technology solutions (software) applied to Defence, Aeronautics, Security, Transport and Space, as well as a competence centre for all in Space, Critical Infrastructure Security and Transport.
Link to PLANET	THALES has one patent related to PLANET 1. https://worldwide.espacenet.com/publicationDetails/originalDocument?CC=EP&NR=2922040B1&KC=B1&FT=D&ND=3&date=20180425&DB=&locale=en_EP THALES has one projects related to PLANET 2. https://transformingtransport.eu/

Company information	**NAME: ERICSSON** **TYPE: Large Industry** **COUNTRY: Sweden** **WEBSITE: https://www.ericsson.com/en**

Value chain position	Technology provider/developer
Estimated Market position/Strength	Interested Party/Buyer
General description	ICT company specialized in 5G, Internet of Things, Mobile broadband, Communication services, Managed services, Fixed broadband, LTE, 3G, 4G, OSS, BSS, Cloud, Network, Telecom, IP, Technology For Good, Sustainability, Intelligent Transport Systems, AI e R&D activities
Link to PLANET	ERICSSON has one patent related to PLANET 1. https://worldwide.espacenet.com/publicationDetails/originalDocument?DB=&ND=3&FT=D&date=20200305&CC=WO&NR=2020044353A1&KC=A1 ERICSSON has two projects related to PLANET 2. https://www.corealis.eu/ 3. https://cordis.europa.eu/project/id/875530

Company information	**NAME: NOKIA** **TYPE: Large Industry** **COUNTRY: Finland** **WEBSITE: https://www.nokia.com/**
Value chain position	Technology provider/developer
Estimated Market position/Strength	Interested Party/Buyer
General description	Leading company specialised in Telecommunications and software solutions for many sectors, including Logistics and Transportation services.
Link to PLANET	NOKIA has one patent related to PLANET 1. https://worldwide.espacenet.com/publicationDetails/originalDocument?DB=&ND=3&FT=D&date=20190502&CC=WO&NR=2019081816A1&KC=A1 NOKIA has one projects related to PLANET 2. https://www.ict4cart.eu/#:~:text=ICT%20Infrastructure%20for%20Connected%20and,transition%20towards%20road%20transport%20automation

Company information	**NAME: ROBERT BOSCH GMBH** **TYPE: Large Industry** **COUNTRY: Germany** **WEBSITE: https://www.bosch.com/**
Value chain position	Technology provider/developer

Estimated Market position/Strength	Interested Party/Buyer
General description	Robert Bosch GmbH is a German multinational company, the world's largest manufacturer of automotive components, which has business relationships with almost all the automotive companies in the world. It also provides IoT services for mobility and logistics processes
Link to PLANET	ROBERT BOSCH GMBH has one patent related to PLANET 1. https://worldwide.espacenet.com/publicationDetails/originalDocument?DB=&ND=3&FT=D&date=20180510&CC=US&NR=2018128001A1&KC=A1 ROBERT BOSCH GMBH has two projects related to PLANET 2. https://www.ict4cart.eu/#:~:text=ICT%20Infrastructure%20for%20Connected%20and,transition%20towards%20road%20transport%20automation 3. https://cordis.europa.eu/project/id/875530

Company information	**NAME: MAERSK AS** **TYPE: Large Industry** **COUNTRY: Denmark** **WEBSITE: https://www.maersk.com/**
Value chain position	Shipper; Logistics Service Provider; Shipping Company
Estimated Market position/Strength	Interested Party/Buyer
General description	Danish integrated shipping company, active in ocean and inland freight transportation and associated services, such as supply chain management, logistics and port operations.
Link to PLANET	MAERSK AS has one projects related to PLANET 1. http://www.selisproject.eu/

Company information	**NAME: DEUTSCHE BAHN** **TYPE: Large Industry** **COUNTRY: Germany** **WEBSITE: https://www.bahn.com/en/view/index.shtml**
Value chain position	Logistics Service Provider; Shipping Company; Fleet Owner
Estimated Market position/Strength	Interested Party/Buyer
General description	Provider of mobility and logistics services, ITC solutions and construction and engineering services in railway, maritime and aerial transport
Link to PLANET	DEUTSCHE BAHN has one patent related to PLANET

	1. https://worldwide.espacenet.com/publicationDetails/originalDocument?CC=WO&NR=2018087341A1&KC=A1&FT=D&ND=3&date=20180517&DB=&locale=en_WO DEUTSCHE BAHN has one project related to PLANET 2. https://projects.shift2rail.org/s2r_projects.aspx/arcc/

Company information	**NAME: TX LOGISTIK AG** **TYPE: Large Industry** **COUNTRY: Germany** **WEBSITE: https://www.txlogistik.eu/**
Value chain position	Shipping Company
Estimated Market position/Strength	Potential Interested Party/Buyer
General description	TX Logistik AG provides rail transportation services. The Company specializes in rail transport for the trade, automobile, and chemicals sectors.
Link to PLANET	TX LOGISTIK AG has two projects related to PLANET 1. https://aeolix.eu/ 2. https://nextrust-project.eu/

Company information	**NAME: DFDS AS** **TYPE: Large Industry** **COUNTRY: Denmark** **WEBSITE: https://www.dfds.com/en/about**
Value chain position	Technology provider/developer; Hubs and Ports; Shipper; Logistics service providers; Shipping company; Fleet owner
Estimated Market position/Strength	Potential Interested Party/Buyer
General description	To over 10,000 freight customers, they deliver high reliability through ferry & port terminal services and transport & logistics solutions.
Link to PLANET	DFDS AS has one project related to PLANET 1. http://www.selisproject.eu/

Company information	**NAME: JAN DE RIJK LOGISTICS** **TYPE: Large Industry** **COUNTRY: Netherlands** **WEBSITE: https://www.janderijk.com/**

Value chain position	Shipper; Logistics Service Provider; Shipping Company; Fleet owner
Estimated Market position/Strength	Potential Interested Party/Buyer
General description	Jan de Rijk Logistics is a leading provider of transportation, warehousing, distribution and logistics services, along with related pan-European supply chain management solutions.
Link to PLANET	JAN DE RIJK LOGISTICS has three projects related to PLANET 1. https://aeolix.eu/ 2. http://www.clusters20.eu/ 3. https://transformingtransport.eu/

Company information	**NAME: NETWORK RAIL INFRASTRUCTURE LIMITED** **TYPE: Large Industry** **COUNTRY: United Kingdom** **WEBSITE: https://www.networkrail.co.uk/**
Value chain position	Infrastructure Service Provider
Estimated Market position/Strength	Potential Interested Party/Buyer
General description	Network Rail owns, operates and develops Britain's railway infrastructure
Link to PLANET	NETWORK RAIL has two projects related to PLANET 1. https://transformingtransport.eu/ 2. https://www.safe10tproject.eu/

Company information	**NAME: NALLIAN** **TYPE: SME** **COUNTRY: Belgium** **WEBSITE: https://www.nallian.com/**
Value chain position	Technology provider/developer
Estimated Market position/Strength	Technology provider
General description	Nallian is the first open Data Sharing Platform for Business Collaboration, helping communities of business partners to become high performance clusters. It is specialised in Supply Chain Visibility, Cloud, Social Media, B2B, Consumerization of IT, Business Agility, Supply Chain Collaboration, Community Platforms, EDI, Data Sharing Platform e Multi Enterprise Collaboration
Link to PLANET	NALLIAN has one patent related to PLANET

1. https://worldwide.espacenet.com/publicationDetails/originalDocument?DB=&ND=3&FT=D&date=20200227&CC=WO&NR=2020038705A1&KC=A1

NALLIAN has one project related to PLANET

2. http://www.clusters20.eu/

4 Evaluating stakeholders concerns and motivations

4.1 Methodology & Scope

4.1.1 Scope of the concerns and needs assessment

While section 3 deals with the identification of specific audiences and specific relevant parties for the PLANET value chain, section 4 deals with the identification of concerns and needs from these stakeholders.

4.1.2 Methodology of the concerns and needs assessment

This assessment complements the intelligence that PNO performed and detailed in section 3. With the aim of provide useful inputs for the upcoming activities during the PLANET project for the future exploitation of project results, this assessment has been built with a completely business and market-oriented mindset.

The main benefit obtained by this approach is to capture and provide a clear view of the main competitive messages that the PLANET solutions could provide towards exploitation and communication activities. This will be done with the following specific objectives:

- Identifying what stakeholders intend to do.
- Identifying what are the pains of stakeholders while performing these activities.
- Identifying what are the needs of stakeholders while performing these activities.
- Identifying what are the opportunities that PLANET solutions may have while responding to these pains and needs.

This has been done with the inputs of PLANET's consortium, taking advantage of their knowledge and position in the market to understand the abovementioned motivations.

The segments that are described in the previous list, are in line with a tool that is used for business modelling: the **Value Proposition Canvas** [1]**.** This tool is a very useful tool to identify customer segments and the needs these customers have (customer segments) and at the same time, evaluate the proposed future exploitation strategy towards solving these needs (value proposition). From this analysis the core messages for these customers will be generated and, in combination with the results of the desk research, it will be possible to extrapolate these messages to the different stakeholders identified.

The main dimensions that are assessed in this tool are represented in the following figure:

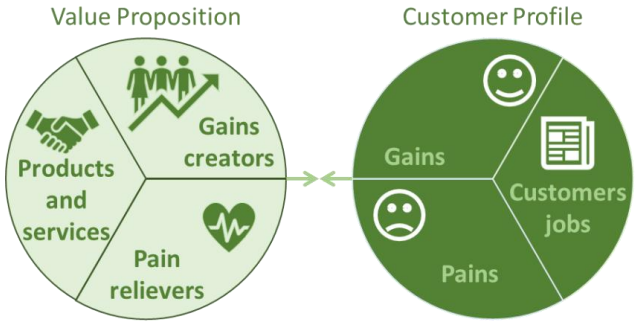

Figure 19. The Value Proposition Canvas (based on the original model from Strategyzer).

As mentioned above, PLANET partners have participated in the generation of this assessment. To do so, a template was prepared as starting point and distributed among partners with clear instructions and guidance for providing information. This template is provided in Annex V to this document.

The profiling of stakeholders will use the same categories presented in the stakeholder analysis of section 3: *innovators* and *investors*. As mentioned above, this assessment is a cornerstone for the upcoming exploitation activities that will be carried out.

The outcome of this section includes:

- A three-way assessment of stakeholders based on the evaluation of the Value Proposition Canvas:
  1. *What are these stakeholders' obligations?*
     The identification of the 'jobs' or the 'responsibilities' of stakeholders serves to identify and

2. Provide intermodal transport alternatives, promoting a planned articulation between different and alternative means of transport.
3. Ensure accurate estimation of allocation of goods and resources needed to ensure transport times and predict potential changes.
4. Connect transnational supply chain actors, ensure communication, and smooth flow of goods and information.
5. Track conditions of organised transport (position, temperature, humidity, shocks and interference) and ensure information flow on e-commerce shipments.
6. Minimise processing time and cost and increase successful delivery rates.
7. Assess and reduce the risks of cargo and implementation of different technologies.
8. Scout and promote connectivity and other potential disruptive technologies that can serve to boost competitiveness.

Emotional jobs - related to how their customers want to feel:

9. Increase awareness of the logistics offer and quality standards for customers or potential customers.
10. Assess complaint processes and search for damage causes.

Social jobs - related to how they want to be perceived:

11. Provide a high-quality commercial offer and design new business models relevant to customers.
12. Ensure operational performance and management while reducing time loss among users or clients.
13. Evaluate the impact of transportation flows while managing large volumes of information.
14. Strengthen commercial and cooperation relationship with partners and clients.

4.2.1.3 *Pains and concerns*

The following table summarises the needs and concerns identified based on the pain assessment of the *investors* stakeholders group:

Table 6: Summary of the main pains and concerns identified. Intensity: 1 – Low relevance, 3 – High relevance; Frequency: 1 – Rare, 3 – Very often. Current order is defined by the intensity as first criteria and frequency as second criteria.

#	Pain/Concern	Intensity	Frequency
1	Anticipating accurately resources needed for a service.	3	3
2	Bureaucracy.	3	3
3	Difficulties in decision-making situations.	3	3
4	Inefficient cooperation and relationship between different operators.	3	3
5	Lack of digitalisation systems, common global identification systems or non-compatible readable inputs.	3	3
6	Long processing and delivery times.	3	3
7	Long waiting times for information about location and status of cargo.	3	3
8	Bottlenecks, congestion or accidents reverting into lack of knowledge of changes in estimated transport time during the whole value chain due to external occurrences like variability of weather conditions.	3	2
9	Lack of transparency in terms of monitoring the service or overall knowledge of conditions of organised transport (position, temperature, humidity, shocks and interferences).	3	2
10	Low performance of solutions integrated.	3	2
11	Uncertainty.	3	2
12	Upfront investment costs and efforts associated to new technologies implementation until it is conveniently integrated.	3	2
13	Loses or damages of shipments through the value chain.	3	1
14	Unclear division of liability in case of damages.	3	1
15	Limited access to on-site verification processes through the whole process.	2	3
16	Prioritization of loads.	2	2
17	Resources and costs for a service in overtime and unanticipated downtimes.	2	2
18	Internal or sectorial reluctances to changes.	2	2
19	Usage of non-automatized solutions (like emails) for notifying the status of a cargo.	2	2
20	High logistic costs and long down times.	2	2
21	High number of operational errors and reallocation of resources on the fly.	2	2
22	Lack of modern tracking systems.	2	1
23	Differences on taxes systems and changes in regulations around the world.	2	1
24	Low level of safety of transported cargo.	2	1
25	Frustrations, annoyances, dissatisfactions and worries from own and customers' perspective.	1	2

#	Pain/Concern	Intensity	Frequency
26	Negative impact in the market in terms of reputation, market share or customer loyalty; due to unsuccessful deployment of solutions.	1	2
27	Lack of improvements from feedback received.	1	2

In order to see how relevant these needs are with regards to the jobs to be done, the mapping of these needs with regards of the jobs described in section 4.2.1.2. The following figure, provides a clear correspondence of the considered to be most annoying needs/concerns (with either an intensity or a frequency of 3) with the number of jobs that are affected by them:

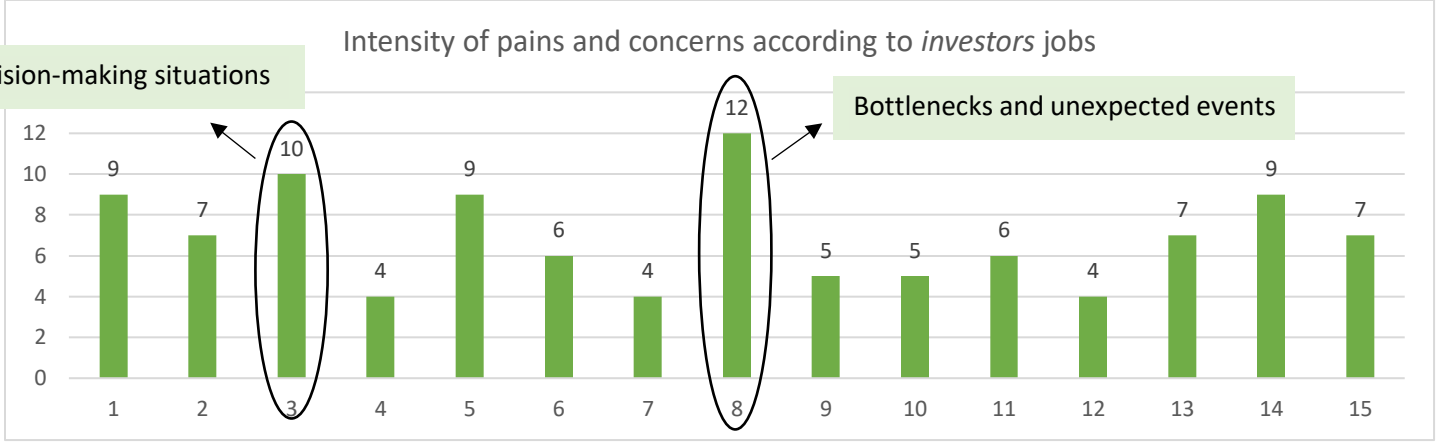

Figure 20: Relationship between the most annoying pains/concerns and their presence in the jobs to be performed by stakeholders.

As can be seen in Figure 20, according to the assessment performed in cooperation with PLANET partners, bottlenecks and unexpected events are considered the most relevant concern for stakeholders, while decision making situations reflects the concern of providing high quality and valuable information for stakeholders in order to find the best service or route to perform a certain service. Other aspects that are worth highlighting here are in line with the previous ones: the potential lack of information and digitalization systems, generates tensions while simulating the resources necessary for delivering a certain service and at the same time generates inconveniences and conflicts the rare event of damage in the cargo occurs.

4.2.1.4 *Needs and expectations*

Considering the jobs that stakeholders intend to do, the main needs that they would require from the PLANET solutions are listed in the following table:

Table 7: Summary of the main needs and expectations identified. Intensity: 1 – Low relevance, 3 – High relevance; Frequency: 1 – Rare, 3 – Very often. Current order is defined by the intensity as first criteria and frequency as second criteria.

#	Need/Expectation	Intensity	Frequency
1	Simplify transportation service for end-users (both professionals or individuals) and reduce the efforts spent for processing information thanks to the increased trustworthiness, reliability and professionalisation of data management and monitoring of a delivering system	3	3
2	Promote the articulation of operations between different alternative modes of transport towards a future sustainable and efficient intermodal transport	3	3
3	Provide precise, unique and seamless information and communication on transport and flows with paperless document transactions and rationalised bureaucracy load of administrative procedures	3	3
4	Automatize cargo data exchange during transportation and facilitate the optimisation of operation enabling safety, efficiency, control, and emissions improvements	3	3
5	Unique identification of shipments and products	3	3
6	Increase safety of transport goods	3	3
7	Improve efficiency and competitiveness of internal processes reverting in higher competitive advantage in the market and higher return of investments in logistics sector	3	3
8	Gain independency in the shipment process independently of the service provider and the final destination, empowering data driven proactive cargo decision making	3	2
9	Increase transparency, efficiency and control of organised transport and handling processes provided to clients and provide information solutions on the status, monitoring solutions, and location of goods in real-time and with clear records of the events affecting the cargo that could cause bottlenecks	3	2
10	Optimise logistics and supply chain processes by gaining experience and using digital IoT-based solutions and increase the possibility of planning further activities with accurate delivery times	3	2
11	Improve the service for end-users (including e-commerce) and increase the satisfaction with the service by reducing operational issues and improving deliveries and complaint process management -if any-	3	2
12	Improve forecasts in advance of necessary resources and reduce disruptions, errors, emergencies, and loses in the logistics value chain, basing predictions on near real-time data	3	2
13	Smooth implementation of solutions in order not to affect current operations and services and create new trade and business opportunities and routes, including new commercial channels	3	2
14	Integrate the monitoring systems with e-commerce platforms	3	2
15	Increase capacity of handling operations and faster replanning of routes and services for deliveries thanks to improved optimisation of resources and available tools and means	3	1
16	Anticipate to changes in legal requirements of transit countries	3	1
17	Savings in terms of time -including custom clearance time- and costs -including staff structure and packaging- through integrated networks and systems	3	1
18	Deliver a high service level without errors and lower environmental impact that open the door to increase the competitiveness of the customers	3	1
19	Boosted introduction of physical internet solutions in the market	3	1
20	Promote communication, cooperation, synchronisation and transparency among stakeholders involved and improve intermodal transport through analysis of large scale transport data	3	1

21	Enhance the value proposition of companies and promotion of competences	2	3
22	Fix underperformance solutions or increase performance of already implemented ones	2	2
23	Standardisation of global best-practices, processes and reduced implementation risk and uncertainties for adopting new solutions	2	1
24	Reduce overall transportation time and costs and increase financial margin	2	1
25	Traceable and documented conditions and risk of transport to clearly define responsibilities throughout the value chain	2	1
26	Provide automatic alarms that allow the customers to gain flexibility with their supplies	2	1
27	Clear transferability guidance	2	1
28	Detect in advance the needs of other actors from the value chain	1	2
29	Access to further funding opportunities or to increase overall profitability of the commercial offer	1	1
30	Achieve KPIs usually collected in Corporate Responsibility towards a real reduction of sectorial environmental footprint	1	1

In this occasion, needs and expectations have also been mapped in order to identify what could be the key aspects that these stakeholders are willing to find out within PLANET solutions. The following figure illustrates this correspondence:

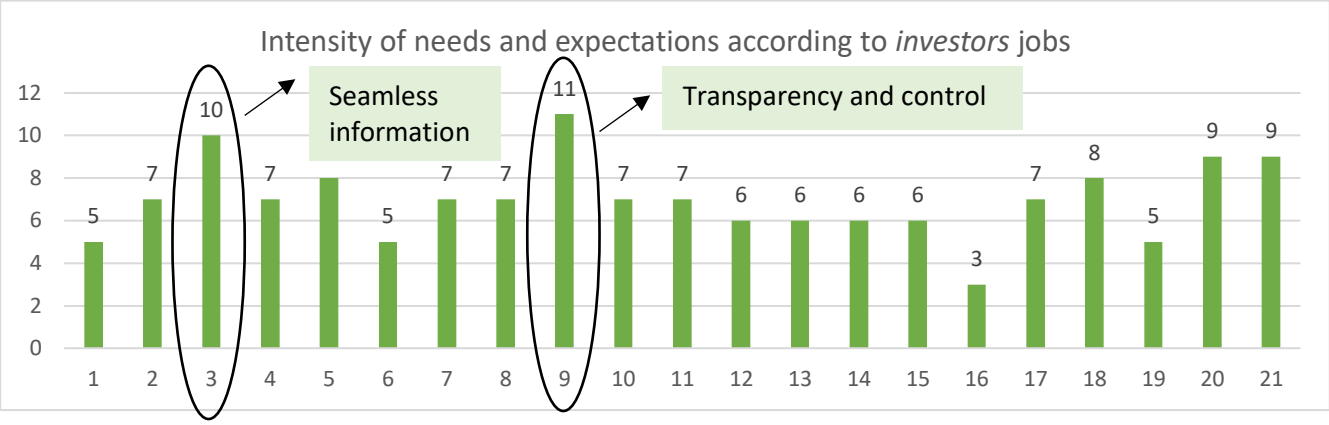

Figure 21: Relationship between the most promising needs/expectations and their presence in the jobs to be performed by stakeholders.

As can be seen in Figure 21, the most aligned expectations with PLANET's stakeholders obligations are related to the need of an enhanced framework where secure and seamless information is exchanged towards a more transparent cooperation between actors and towards the end-user. The other most relevant needs are related to the promotion of cooperation among stakeholders, and the possibilities that are opened in terms of new business models thanks to PLANET proposed solutions.

4.2.1.5 *Competitive advantages*

After the evaluation of the pains and concerns, on one hand; and needs and expectations on the other hand; it is possible to generate a matrix to address PLANET's competitiveness with the main core messages that the project results could take advantage of when addressing the future exploitation activities. The following figure presents this matrix:

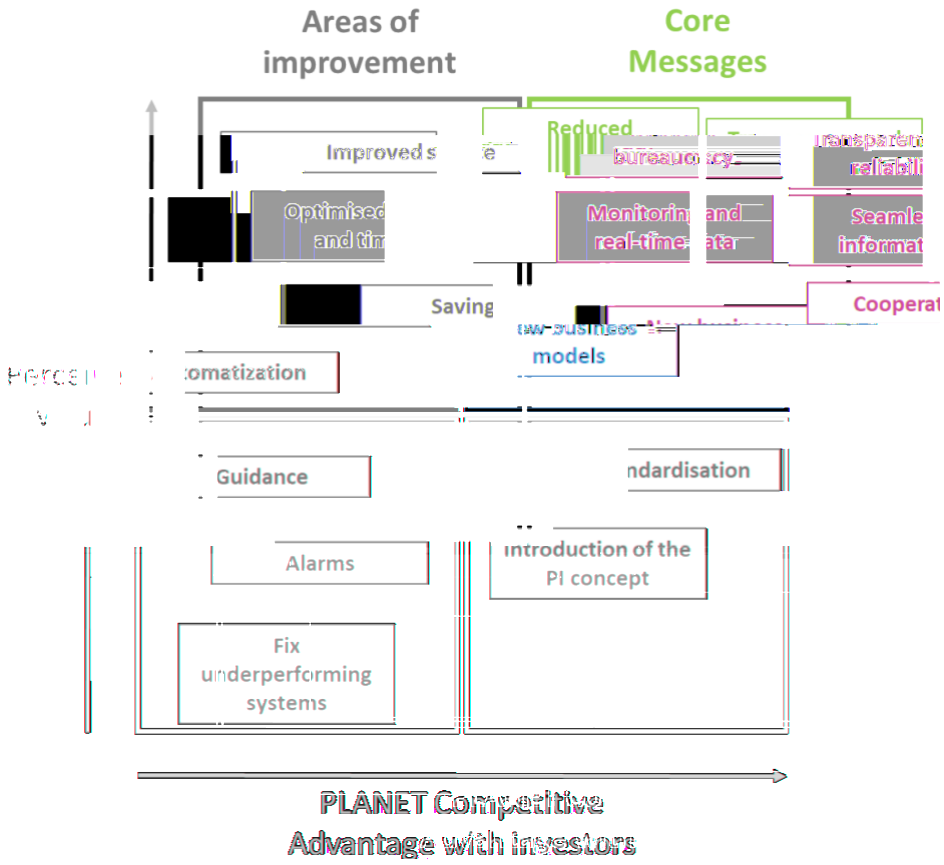

Figure 22: The PLANET competitive matrix toward investors.

Figure 22 summarises the main conclusions of the insights collected for *investors* stakeholders group towards future PLANET project activities.

4.2.2 Innovators

4.2.2.1 *Profile*

Considering the results obtained from the Stakeholder Analysis, as summarized in the highlights of section 3.3.3, the landscape of innovators is crowded with excellence research centres and companies that have a strong capacity for leading the logistics sector.

This segment is represented within the consortium by the following partners: INLE, CERTH, CATS, COSTech, KNT, EBOS, EUR., CLN, FV, ZLC, HARDT, IBM, ITA, NGS, SIR, PAN, VLTN, WI. Regardless of this, some interests may differ and roles may swap among some of them in certain situations.

4.2.2.2 *Jobs or responsibilities*

Continuing the assessment carried out for the investors stakeholders group, the first step is to identify the main jobs or responsibilities for the *innovators* stakeholder group.

Functional jobs - related to the activities that are requested by their customers:

1. Develop and validate next generation technologies combining scientific and research concepts and provide supply chain digitalisation and R&D services to evolve the available solutions and create new market opportunities.
2. Improve and optimise freight efficiency, corridors, delivery management and sustainability of services.

3. Estimate and improve the estimation of the resources required for services and allocate appropriately goods and transport.
4. Enhance the insights of good and information flows through transport corridors.
5. Emphasise the Physical Internet concept as an enabler of seamless transport and cooperation among operators and other stakeholders.
6. Provide Open Source solutions that empower enterprises to move to cloud or hybrid services, reducing the overall costs of commercial software while boosting security, support and reliability.

Emotional jobs - related to how their customers want to feel:

7. Provide safe and reliable systems.
8. Maximise the result while minimising the usage of resources.

Social jobs - related to how they want to be perceived:

9. Create awareness on environmental considerations of logistics.

4.2.2.3 *Pains and concerns*

The following table summarises the needs and concerns identified based on the pain assessment of the *innovators* stakeholders group:

Table 8: Summary of the main pains and concerns identified. Intensity: 1 – Low relevance, 3 – High relevance; Frequency: 1 – Rare, 3 – Very often. Current order is defined by the intensity as first criteria and frequency as second criteria.

#	Pains/Concern	Intensity	Frequency
1	Combine excellent customer services with low management and operational costs.	3	3
2	Dealing with separate and inaccurate information mastered by independent operators and entities.	3	3
3	Errors and omissions in data available for testing.	3	3
4	Historical complexity operations and persistence of existing legacy systems that are not smart enough and require manual operation to run smoothly.	3	3
5	Difficulties to overcome barriers and promote a real shift to intermodal systems.	3	2
6	Reluctance to adopt disruptive solutions in a relatively short time.	3	2
7	Out of range sectorial interests or market trends that generate non-sustainable habits, consumption, and negative impacts.	3	1
8	Deployment of advanced analytics system may be overwhelming and intimidating.	3	1
9	Excess of intermediaries and links in the sector.	2	3
10	Continued maintenance of security systems.	2	2
11	Maintaining trust through the value chain while proposing new solutions.	1	2
12	Planning of training activities for proposed solutions.	1	1

In order to see how relevant these needs are with regards to the jobs to be done, the mapping of these needs with regards of the jobs described in section 4.2.2.2. The following figure, provides a clear correspondence of the considered to be most annoying needs/concerns (with either an intensity or a frequency of 3) with the number of jobs that are affected by them:

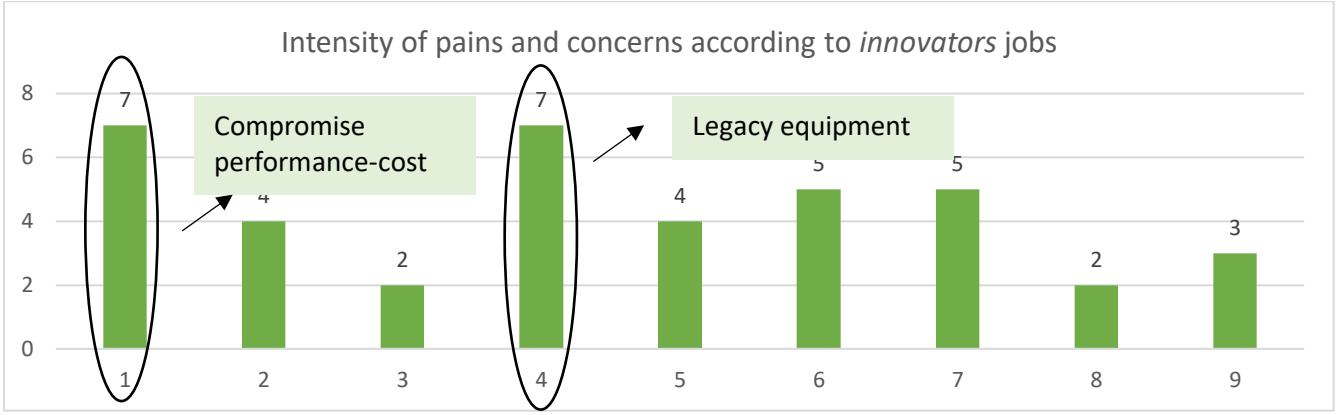

Figure 23: Relationship between the most annoying pains/concerns and their presence in the jobs to be performed by stakeholders.

As can be seen in Figure 20, according to the assessment performed in cooperation with partners, the presence of legacy equipment is a pain for the future deployment of digitalisation and IoT based solutions, due to the need of additional layers in the system that may lead to errors in data management. On the other hand, the compromise of performance and costs savings is a challenge per itself when speaking about solutions to renew the logistics sector. Other worth-mentioning concerns are related to the reluctancy of sectorial actors to integrate the proposed solutions, that is something that should be overcome thanks to the work performed during the exploitation activities of PLANET project.

4.2.2.4 *Needs and expectations*

Considering the jobs that stakeholders intend to do, the main needs that they would require from the PLANET solutions are listed in the following table:

Table 9: Summary of the main needs and expectations identified. Intensity: 1 – Low relevance, 3 – High relevance; Frequency: 1 – Rare, 3 – Very often. Current order is defined by the intensity as first criteria and frequency as second criteria.

#	Need/Expectation	Intensity	Frequency
1	Reduce overall costs of complex logistics supply chain operators by improving resources utilisation, coordination and integration, reduce interferences and inefficiencies between the actors within the supply chain, and improve overall performance. Very often.	3	3
2	Build strong sectorial consensus, reduce fragmentation and boost cooperation among sectorial actors within the transport corridors.	3	3
3	Assistance on decision making based on high quality reliable information.	3	3
4	Balance service cost, ease-of-use, security, performance, and scalability.	3	3
5	Provide clearly oriented and focused solutions that generate not only an overall sectorial performance improvement but positive social consequences in terms of environmental impact and operational costs.	3	3
6	Provide high-quality solutions that can shorten delivery time and more accurate, secure, safe, and timely services.	3	3
7	Develop and test proof-of-concept solutions applying novel concepts and operational design enabled by new technologies in the transport and logistics value chain in real conditions.	3	2
8	Open the door to solutions that may have not been explored in the past like blockchain technologies.	3	2

9	Illustration of the Physical Internet concept and championing the paradigm.	3	1
10	Deliver security and privacy by designed solutions from scratch.	2	3
11	Provide solution based on open standards that ease the standardisation and can be easily integrated into existing legacy processes.	2	2
12	Respond to market needs and strategical business needs and reduce investment and maintenance costs.	2	2
13	Increase their reputation and improve sectorial positioning.	2	2
14	Design a user experience adapted to investors.	2	2
15	Contributions to open-source communities for continuous business alignment worldwide.	2	2
16	Deliver simplified tools in terms of usage complexity and maintenance needs.	2	1
17	Get rid of barriers for the deployment of disruptive solutions.	2	1

In this occasion, needs and expectations have also been mapped in order to identify what could be the key aspects that these stakeholders are willing to contribute through PLANET solutions. The following figure illustrates this correspondence:

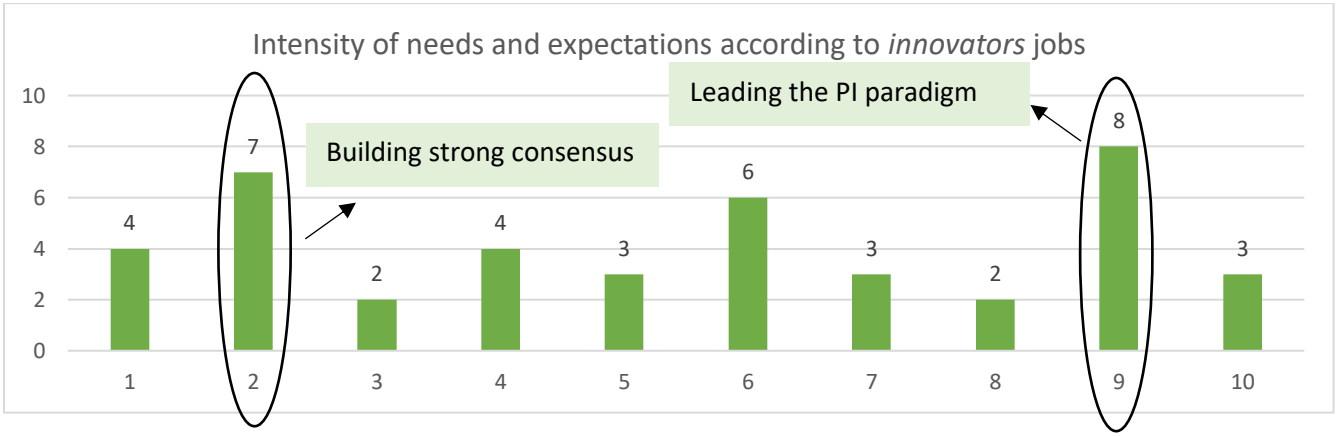

Figure 24: Relationship between the most promising needs/expectations and their presence in the jobs to be performed by stakeholders.

As can be seen in Figure 24 it is noticeable that the main needs of innovators are mainly driven by the need and the desire of paving the way for deploying the proposed solutions for optimizing the costs and resources allocated in logistic services.

4.2.2.5 *Competitive advantages*

The same exercise of presenting visually the summary of the main core messages of PLANET for this stakeholder group has been carried out as shown below:

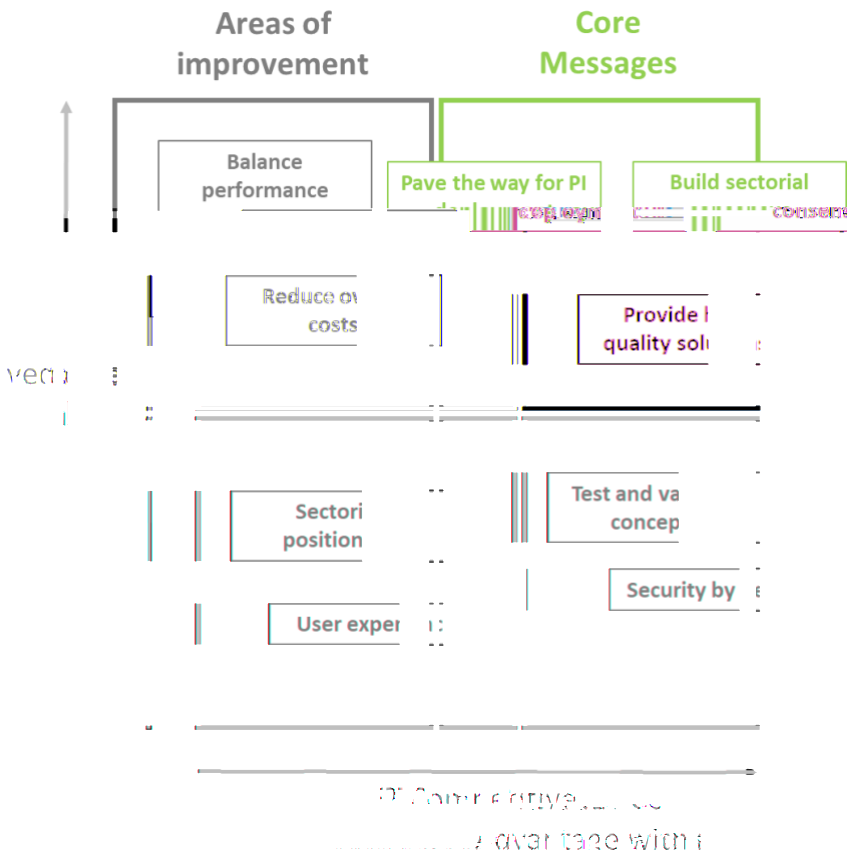

Figure 25: The PLANET competitive matrix toward innovators.

As mentioned in the previous section, it can be read that the main opportunity for PLANET with this stakeholders group is related to providing the right environment for creating engagement towards PI solutions.

5 Conclusions

5.1 Results overview

This deliverable D5.1 "Stakeholder Analysis Report", which is the first deliverable within WP5 '"Dissemination, Commercialisation, Policy recommendations", includes a preliminary study as a base for the value-chain, technological and business analyses to come during the PLANET project.

By cross-checking many different sources, the report represents a unique one-stop-shop overview of transport and logistics markets. The definition of stakeholders has been defined as "Any group or entity with a common interest or stake in the outcomes of the Project and associated to the PLANET value chain ". The methodology has been applied to identify the relevant stakeholder groups, to analyze these groups in order to understand their interests and influence, and to map these relationships visually. Furthermore, this deliverable prioritizes their relevance to the Project which will serve to optimize the future efforts to both communicate and engage with them as well as to mobilise them to support the project's exploitation objectives identified in a later stage.

This has also been complemented with the involvement of project partners, that have shared their knowledge about the market and their own needs and expectations in order to clearly understand the profiles of the relevant stakeholder groups that have been identified. The most relevant results of this assessment are displayed in the following table:

Table 10: Summary of the needs and concerns of the two large stakeholders group identified.

	Investors	Innovators
Pains and concerns	- Bottlenecks in operations. - Unexpected events. - Lack of information in decision-making information.	- Integration of legacy equipment. - Balance performance and costs incurred. - Reluctancies and unfavourable sectorial dynamics.
Needs and expectations	- Transparency and seamless information. - Promotion of cooperation among players. - Improved costs and overall performance.	- Leading the PI paradigm. - Build strong consensus for sectorial changes. - Deliver high quality solutions to the market.

This table and the detailed insights that are provided in section 3 and 4, respond to the threefold objective that was expected for this deliverable:

- Determine the right communication management strategy according to vital issues for stakeholders.
- Build relationships in the near future with key stakeholders thanks to the identification that has been carried out of entities and issues.
- Set the cornerstone for future commercialisation plans that will be developed for PLANET solutions in latter stages of the project.

5.2 Conclusions and Next Steps

Stemming from the analysis of the innovation background and the value-chain descriptions in this document, in the next period a thorough validation phase of the identified stakeholders, with a high emphasis on the industrial players, will start in close collaboration with the Project partners that are developing Key Exploitable Results, to use this stakeholder framework for assessing the potential commercialization of the project and produce a complete Business & Commercialization plan for month 34.

The stakeholder identification and analysis are an iterative process, that all partners will contribute to throughout the lifetime of the Project, as a continuous collaboration and engagement with stakeholders will take place to adjust to any changes in the context, the institutional surroundings, or companies and their respective roles.

"

" [2].

The Stakeholder Register is thus a living document that will be continuously updated in order to incorporate the perspectives, questions and priorities generated by stakeholders over the course of the Project. The next steps in ST5.1.2 is to invite the top stakeholders that have been identified in section 3.3.4 to the Advisory Board to exchange and confirm their concerns and needs that are relevant for the PLANET Business & Commercialization plan.

6 References

[1] Ostwalder, A.; Pigneur, Y.; Bernarda, G. and Smith, A. 2014. Value proposition design (Strategyzer Series).

[2] Zimmermannn, A. and C. Maennling. 2007. Mainstreaming Participation: Multi-stakeholder management: Tools for Stakeholder Analysis: 10 Building Blocks for Designing Participatory Systems of Cooperation. Promoting Participatory Development in German Development Cooperation. Eschborn, Germany: Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ). http://www.fsnnetwork.org/sites/default/files/en-svmp-instrumente-akteuersanalyse.pdf

Annex I: Description of the Projects related to PLANET

Project Acronym and Title	Objective Description	Coordinator	Participants
ADRIPASS **Integrating multimodal connections in the Adriatic-Ionian region**	Enhance capacity for integrated transport and mobility services and multimodality in the Adriatic-Ionian area.	Central European Initiative - Executive Secretariat	∇Aristotle university of thessaloniki; Durres port authority;∇Foreign trade chamber of bosnia and herzegovina;∇Evtz euregio ohne grenzen mbh;∇Institute for transport and logistics foundation;∇Luka koper, port and logistic system, public limited company;∇Ploče port authority;∇Port of bar holding company;∇Regional unit of thesprotia/region of epirus;∇South east europe transport observatory
AEOLIX **Architecture for EurOpean Logistics Information eXchange**	AEOLIX will establish a cloud-based collaborative logistics ecosystem for configuring and managing (logistics-related) information pipelines.	Ertico - its europe	∇Atos spain sa;∇Austriatech gmbh;∇Bgl ev; ∇Cerema;∇Chalmers tekniska hoegskola ab;∇Collecte localisation satellites;∇Consorzio interuniversitario per l'ottimizzazione e la ricerca operativa (icoor);∇Coop logistik ab;∇Tredit sa;∇Emporiko kai viomichaniko epimelitirio thessaloniki;∇Certh;∇Fundacion cluster de empresas de automocion de Galicia;∇Fundacion para la promocion de la innovacion, investigacion y desarrollo tecnologico en la industria de automocion de galicia; ∇Giventis international bv;∇Hamburg port authority; ∇House of logistics & mobility (holm) gmbh; ∇Ihorks shipping and trading srl; ∇Iru projects asbl; ∇J.a.m. de rijk bv (jan de rijk logistics); ∇Kuehne+nagel societe anonyme for transports & logistics; ∇Ministry of infrastructure, transport and networks; ∇Mondelez european business services centre sro; ∇Neo gls; ∇Novacom services sa; ∇Ntex ab; ∇Hellenic federation of road transports; ∇Privredna komora srbije; ∇Ptv planung transport verkehr ag; ∇Samer & co. Shipping spa; ∇Sdruzeni automobilovych dopravcu cesmad bohemia, zs;∇Stichting connect; ∇Stichting smart freight centre; ∇Syndesmos exagogeon voriou ellados; ∇ Terminal intermodale di trieste fernetti spa; ∇The university of Northampton; ∇T-systems international gmbh;∇Tx logistik ag; ∇Unilever; ∇Uniunea nationala a transportatorilor rutieri din romania; ∇Viadonau – österreichische wasserstraßen-gesellschaft mbh; ∇World professional services srls.r.l (teamnet group)
AEROFLEX **Aerodynamic and Flexible Trucks for Next Generation of Long Distance Road Transport**	To develop and demonstrate new technologies, concepts and architectures for complete vehicles with optimised aerodynamics, powertrains and safety systems as well as flexible and adaptable loading units with advanced interconnectedness contributing to the vision of a "physical internet", supporting vehicle manufacturers and the logistics industry to achieve the coming challenges for road transport.	Man truck & bus se	∇Centro ricerche fiat scpa;∇Chalmers tekniska hoegskola ab; ∇Creo dynamics ab (now faurecia creo ab); ∇Daf trucks nv; ∇ Deutsches zentrum fuer luft - und raumfahrt ev (dlr);∇Fraunhofer e.v; ∇Idiada automotive technology sa; ∇Iveco s.p.a; ∇Manufacture francaise des pneumatiques Michelin; ∇Medizinische hochschule hannover; ∇Tno;∇Scania cv ab; ∇Schmitz cargobull ag; ∇Han university of applied sciences; ∇Stichting nationaal lucht- en ruimtevaartlaboratorium - nlr (netherlands aerospace centre); ∇Tirsan treyler sanayi ve ticaret as; ∇Transport & mobility leuven nv;∇Union internationale des societes de transport combine rail-route scrl; ∇Uniresearch bv; ∇Van eck beesd bv; ∇Volvo technology ab; ∇Wabco automotive bv; ∇Wabco Europe; ∇Wabco gmbh;
AIRMEE **Optimizing Logistic Fleets with Machine Learning to**	Airmee is an SaaS logistics platform that optimizes	Airmiz ab	No other participant.

Enable Sustainable On-Demand Deliveries in Cities Airmee	logistics fleets based on proprietary algorithms.		
ARCC Automated Rail Cargo Consortium: Rail freight automation research activities to boost levels of quality, efficiency and cost effectiveness in all areas of rail freight operations ARC	Rail freight automation research activities in order to boost levels of quality, efficiency and cost effectiveness in rail freight operations of the European railway sector. The three areas of research activities are: Transporting and delivering freight via automated trains, developing automated support processes at the nodes and advanced timetable planning.	Deutsche bahn ag	∇Bombardier transportation gmbh; ∇Hitachi rail sts spa; ∇Slovenske zeleznice doo; ∇Trafikverket - trv
ASTAT Autonomous ship transport on the Trondheim Fjord The Research Council of Norway	To investigate such a transport system for short and medium distance transport between main terminals for coastal ships and smaller harbors and quays around Trondheim Fjord. The project is based on autonomous system development.	Kongsberg as	∇Allskog ba; ∇Forsen-yard; ∇Kystrederiene (norwegian coastal shipowners); ∇Kystverket (norwegian coastal administration); ∇Maritime robotics as; ∇Norwegian maritime authority – sjofartsdirektoratet; ∇Sintef as; ∇Trondheim havn
AUTOSHIP Autonomous Shipping Initiative for European Waters AUTOSHIP	Speed-up the Next Generation of Autonomous Ships, by demonstrating in real environment Short Sea Shipping and Inland Water Ways autonomous vessels. The technology package will include full-autonomous navigation, self-diagnostic, prognostics and operation scheduling, as well as communication technology enabling a prominent level of cyber security and integrating the vessels into upgraded e-infrastructure, digital tools.	Ciaotech srl	∇Blue line logistics; ∇Bureau veritas marine & offshore registre international de classification de navires et de plateformes offshore; ∇De vlaamse waterweg nv; ∇Kongsberg Maritime cm as; ∇Kongsberg Maritime as;∇Kongsberg Digital as; ∇Kongsberg Norcontrol as; ∇Sintef as; ∇University of Strathclyde; ∇Upm-kymmene oyj
BOXBOT A fast and powerful 3D cargo space usage optimization service for logistics industry BOX BOT LOGISTICS SOLUTIONS	Multi-objective meta-heuristic algorithm to do fast calculations in seconds using over 30 cargo parameters of mixed loads, operational rules and loading and discharging sequences. Cloud-based solution for effective 3D cargo space optimization service for logistic industry.	Kine robot solutions oy	No other participant
CARGO-ANTS Cargo handling by Automated Next	The project aims to to create smart Automated Guided Vehicles (AGVs) and	TNO	∇Agencia estatal consejo superior deinvestigaciones cientificas (csic); ∇Hogskolan i halmstad; ∇Ict automatisering nederland bv;∇Volvo technology ab

generation Transportation Systems for ports and terminals 	Highly Automated Trucks (HATs) that can co-operate in shared workspaces for efficient and safe freight transportation in main ports and freight terminals.		
CLOUD Collaboration in Logistics Operations and Urban Distribution 	To develop an ecosystem with services & applications for all transport and supply chain stakeholders which aims to improve the supply chain management over door-to-door operations. These operations include: Sourcing, Booking & Planing of logistics services; Planning of trans-european logistics chains; In-transit Execution Management; Tracking and Monitoring.	Institute of Logistics and Warehousing (ILiM)	∇Logistics landscapers; ∇Logit one nv; ∇Marlo as; ∇Matric terminals; ∇Netport science park;∇Sintef as
CLUSTERS 2.0 Open network of hyper connected logistics clusters towards Physical Internet 	Cluster 2.0 objectives and areas of intervention are: Increase the engagement, performance and coordination of terminals and hubs at cluster level targeting: i) increase by 50% the freight managed in the cluster whit current infrastructure, ii) Double the value added activities and iii) increase economic impact in local economies by 5% yearly while keeping neutral local environmental impacts.	Ptv planung transport verkehr ag.	∇Air cargo Belgium; ∇Argusi bv; ∇Association pour la recherche et le developpement des methodes et processus industriels; ∇Autorita di sistema portuale del mar ligure orientale; ∇Bluegreen strategy srl; ∇Chambre de commerce et d'industrie artois; ∇Citydepot;∇Dhl; ∇Duisburger hafen ag - duisport; ∇Enide solutions .s.l; ∇Equimodal sl; ∇Fit consulting srl; ∇Fraunhofer e.v; ∇Fundacion zaragoza logistics center∇Heathrow airport limited; ∇Innovatrain ag; ∇Interporto bologna spa; ∇J.a.m. de rijk bv-jan de rijk logistics; ∇Mosaic factor sl; ∇Nallian; ∇Seability ltd.; ∇Procter & gamble services company nv; ∇Piraeus containers terminal s.a.; ∇Trelleborgs hamn ab;∇Union internationale des chemins de fer; ∇Universiteit antwerpen; ∇Van eck beesd bv; ∇Worldwide flight services belgium nv
CONSENSUS ClustErs Networked for SUStainable logistics 	The goal is to develop, implement and improve a set of clusters that exist or build around logistics centers.	Marlo as	No other participant
CORCAP Capitalising TEN-T corridors for regional development and logistics 	Improve coordination among freight transport stakeholders for increasing multimodal environmentally-friendly freight solutions.	Saxon State Ministry of the Interior	∇Freeport of Budapest Logistics; ∇Győr-Sopron-Ebenfurth Railway; ∇Institute of Spatial Planning - TU wien; ∇kordis jmk; ∇kti Institute for Transport Sciences Non-Profit Ltd.; ∇New railway line Dresden – Prague EGTC; ∇Rostock Port; ∇Saxon Inland Ports Upper Elbe; ∇Ústí Region
COREALIS Capacity with a pOsitive enviRonmEntal and societAL footprInt: portS in the future era 	COREALIS proposes a strategic, innovative framework, supported by disruptive technologies, including IoT, data analytics, next generation traffic management and 5G,for modern ports to handle future capacity, traffic, efficiency and environmental challenges	Institute of communication and computer systems	∇ Autorita di sistema portuale del mar tirreno settentrionale;∇Consorzio nazionale interuniversitario per le telecomunicazioni;∇Dynniq nederland bv; ∇Ericsson; ∇Ertico - its Europe; ∇Fundacion valenciaport; ∇Havenbedrijf antwerpen; ∇Marlo as; ∇Mosaic factor sl; ∇Seability ltd.; ∇Nec laboratories europe gmbh; ∇Sgs societe generale de surveillance sa; ∇Piraeus containers terminal s.a.; ∇Steveco oy; ∇Stichting deltares; ∇Vtt oy

CPEWS **Cyber-Physical Early Warning System** 	Cyber-physical early warning system for connected and autonomous vehicles and associated infrastructure to provide real-time protective monitoring detecting potential cyber security and functional safety violations.	Cyberowl Limited	No other participant
DOCKSTHEFUTURE **Developing the methodology for a coordinated approach to the clustering, monitoring and evaluation of results of actions under the Ports of the Future topic** 	To define the vision for the ports of the future in 2030, covering all specific issues that could define this concept including among others, dredging, emission reduction, energy transition, electrification, smart grids, port-city interface and the use of renewable energy management.	Circle spa	∇Institute of shipping economics and logistics (isl); ∇Magellan-associacao para a representacao dos interesses portugueses no exterior; ∇Ports and terminals cvba; ∇Universita degli studi di genova
DYNAHUBS **new application designed to kick start the development of the Physical Internet using a crowd-sourced approach** 	To provide an exchange mechanism to form a Physical Internet on the existing transportation infrastructure enabling users to switch between different modes of transport, cancel unnecessary journeys, shorten routes and share capacity between vehicles, goods and people.	Lojika bilgi teknolojileri ve servisleri ticaret as	∇S3transportation llp; ∇Sustainable innovation i sverige ab; ∇Universidad politecnica de madrid
EASYLOG **Optimized Logistics for ports and intermodal transport** 	EasyLog designs, develops and implements an innovative ICT system for optimised management of information and procedural flows among the operators of the cross-border port supply chain. The general objective is to improve the mobility of rolling stock between cross-border regions.	Università degli Studi di Cagliari - Dipartimento Scienze Economiche e Aziendali - CIREM	∇Autorita di sistema portuale del mar tirreno settentrionale; ∇Camera di commercio industria artigianato agricoltura della maremma e del tirreno; ∇Camera di commercio industria e artigianato riviere di liguria; ∇Camera di commercio, industria, artigianato e agricoltura di sassari; ∇Chambre de commerce et d'industrie de bastia et de la haute-corse; ∇Groupement d'intérêt public pour la formation et l'insertion professionnelles de l'académie de nice; ∇Universita degli studi di genova
EFFICIENTFLOW **Efficient flow of goods and passangers between Finland and Sweden** 	To Improve the flow of goods and passengers through the two corridorsof Gävle-Rauma and Stockholm-Turku. The project will deliver improved processes, business models and ICT tools for enhanced information exchanged between port actors, between ports, between port and hinterland operators and between ports and ships.	Swedish Maritime Administration	∇Finnish Transport Agency; ∇Port of Gävle;∇Port of Rauma Ltd; ∇Satakunta University of Applied Sciences; ∇Vessel Traffic Services Finland

EMMA **Enhancing freight Mobility and logistics in the Baltic Sea Region (BSR) by strengthening inland waterway and river sea transport and proMoting new internAtional shipping services**	In the Interreg project EMMA, waterway administrations, business support organisations and ports together with shipping companies, logistics businesses, and research organisations jointly raised inland waterway transportation higher on the political agendas in five countries around the Baltic Sea.	Port of Hamburg Marketing	No other participant
HANSEBLOC **Hanseatic Blockchain innovations for logistics and supply chain management**	The HANSEBLOC platform will serve as the basic framework for logistics by documenting the transport of all goods in a way that protects their identity.	Hamburg Logistics Initiative	∇Chainstep GmbH; ∇Consider it GmbH;∇HAW Hamburg; ∇HEC GmbH; ∇Itemis AG;∇Kroop & Co. Transport + Logistik GmbH; ∇Kühne Logistics University GmbH; ∇SHOT LOGISTICS GmbH; ∇Sovereign Speed GmbH;∇Transimeksa Intermodal GmbH
HARMONY **Holistic Approach for Providing Spatial & Transport Planning Tools and Evidence to Metropolitan and Regional Authorities to Lead a Sustainable Transition to a New Mobility Era**	HARMONY envisages developing a new generation of harmonised spatial and multimodal transport planning tools which comprehensively model the dynamics of the changing transport sector and spatial organisation, enabling metropolitan area authorities to lead the transition to a low carbon new mobility era in a sustainable manner. At the same time, demonstrations with electric AVs, and drones take place to understand in real-life their requirements.	University college london	∇Aimsun sl; ∇Airbus; ∇Arrival ltd; ∇Associazione urban lab; ∇Comune di torino;∇Enide solutions .s.l; ∇E-trikala ae; ∇Gemeente Rotterdam; ∇Gornoslasko-zaglebiowska metropolia (metropolitan association of upper silesia and dąbrowa basin); ∇Griff aviation as; ∇Institute of communication and computer systems; ∇Moby x software limited; ∇Tno; ∇Organismos astikon sygkoinonion athinon ae - oasa (athens urban transport organisation sa); ∇Oxfordshire county council; ∇Panepistimio aigaiou (uaegean); ∇Significance bv; ∇Technische universiteit delft; ∇Trt trasporti e territorio srl; ∇University of wolverhampton
ICONET **New ICT infrastructure and reference architecture to support Operations in future PI Logistics NETworks**	ICONET will significantly extend state of the art research and development around the PI concept in pursuit of a new networked architecture for interconnected logistics hubs that combine with IoT capabilities and aiming towards commercial exploitation of results.	Inlecom group	∇Consorzio nazionale interuniversitario per le telecomunicazioni; ∇Ebos technologies limited;∇Electronic german link gmbh; ∇ Elupeg limited;∇European council of transport users (european shippers council); ∇Havenbedrijf antwerpen;∇Ibm ireland limited; ∇Instituto tecnologico de aragon – itainnova; ∇New generation sensors srl; ∇Procter & gamble services company nv; ∇Sonae mc - servicos partilhados, sa; ∇Stockbooking; ∇Union internationale des societes de transport combine rail-route scrl; ∇Vltn gcv; ∇Zorgios ioannis
ICT4CART **ICT Infrastructure for Connected and Automated Road Transport**	ICT4CART is providing an ICT infrastructure to enable the transition towards road transport automation. It adopts a hybrid communication approach where all the major wireless technologies, i.e. cellular, ITS G5 and LTE-V, are integrated under a flexible	Institute of communication and computer systems	∇Airbus; ∇Austriatech gmbh; ∇Autobahnen- und schnellstrassen-finanzierungs- aktiengesellschaft; ∇Bayerische motoren werke aktiengesellschaft (bmw group); ∇Centro ricerche fiat scpa; ∇Comune di verona; ∇Ertico - its Europe; ∇Fondazione links - leading innovation & knowledge for society; ∇Ibm ireland limited; ∇Ibm research gmbh; ∇Istituto superiore mario boella sulle tecnologie dell'informazione e delle telecomunicazioni associazione; ∇Seability ltd.; ∇Nokia solutions and networks gmbh &co kg; ∇Robert bosch

	"sliced" network architecture.		gmbh; ∇Societa per azioni autostrada del brennero (brenner-autobahn); ∇Stadt ulm;∇Swarco mizar srl; ∇T-mobile austria gmbh; ∇Universitaet ulm; ∇Urban foresight limited;∇Wind tre spa
IMAT Integrated Maritime Transport Systems	To develop and test land-based sensors, communication systems and control systems used as a means of support to autonomous vessels. The technological infrastructure will be able to provide the transportation systems with increased sensor redundancy and it will be an integrated part to the transport system, that will ensure safe and effective operation.	Kongsberg as	∇Kongsberg norcontrol as; ∇Massterly as; ∇Ntnu; ∇Sintef as
IN2DREAMS INtelligent solutions 2ward the Development of Railway Energy and Asset Management Systems in Europe	To study and proof the application of smart contracts in the railway ecosystems, by addressing also legal and regulatory implications, and advanced visual and rule-based data analytics, including metrics for performance assessment.	Union des industries ferroviaires europeennes - unife	∇Cefriel societa consortile a responsabilita limitata; ∇Dotvision; ∇Evolution energie; ∇Institute of accelerating systems and applications – iasa; ∇Iskratel; ∇Katholieke universiteit leuven; ∇Lem tech France; ∇Purelifi limited; ∇Rete ferroviaria italiana; ∇Rina consulting spa; ∇Universita degli studi di genova; ∇Universitat Konstanz; ∇University of bristol
INTER-IOT Interoperability of Heterogeneous IoT Platforms	To provide a interoperable framework architecture for seamless integration of different IoT architectures present in different application domains. Interoperability will be provided at different levels: device, network, middleware, services and data. The two application domains are m-health and port transportation and logistics.	Universitat politecnica de valencia	∇Alessandro bassi consulting sarl; ∇Asl to5; ∇Association pour le developpement de la formation professionnelle dansles transports; ∇Csp iberian valencia terminal sausa (cosco shipping); ∇Fundacion valenciaport; ∇Neways technologies bv; ∇Prodevelop; ∇Rinicom limited; ∇Systems research institute of the polish academy of sciences ibs pan; ∇Technische universiteit Eindhoven; ∇Telecom italia spa;∇Universita della Calabria; ∇Xlab razvoj programske opreme in svetovanje doo
INTERMODALCBC Investigation of opportunities for reducing the TEN-T network use within the cross-border region Romania-Bulgaria through optimization of the freight and passenger transport and the development of a joint mechanism for support of the intermodal connections	The main objective of the proposed action is to significantly improve the planning, development and coordination of cross-border transport systems for better connections with TEN-T network in the CBC area.	Association of Danube River Municipalities "Danube" (ADRM)	∇The Ecological Initiative and Sustainable Development Group Foundation / E.I.S.D.G Foundation

INTERMODEL EU **Simulation using Building Information Modeling Methodology of Multimodal, Multipurpose and Multiproduct Freight Railway Terminals Infrastructures**	The main objective of this Project is the development of a methodology and ICT tools which will allow an advanced simulation of intermodal railway logistics platforms models in order to support tasks related to both design and planning phases.	Idp ingenieria y arquitectura iberia sl	∇Autorita di sistema portuale del mar ligure orientale; ∇Autorita di sistema portuale del mar ligure orientale; ∇Basf construction chemicals espana sl; ∇Bedeschi spa; ∇Centre internacional de metodes numerics en enginyeria – cimne; ∇Consorci centre d'innovacio del transport; ∇Contship italia spa;∇Dhl; ∇Ferrocarrils de la generalitat de catalunya; ∇Kiruna wagon ab; ∇Macomi bv;∇Vtt oy; ∇Vias y construcciones sa; ∇Viasys vdc oy (now owned by magnet office at topcon positioning); ∇Zarzad nadbaltyckich inicjatyw klastrowych spolka z ograniczona odpowiedzialnoscia
iPrediCTOR **Intelligent Prediction for Cargo Traffic Routing**	The project aims to produce locally optimised sea level predictions to reduce costs in the port, shipping and offshore energy industries.	Sea Level Research Ltd	No other participant
LOGIMATIC **Tight integration of EGNSS and on-board sensors for port vehicle automation**	Advanced location and navigation solution to enable the automation of existing port vehicles. The project will develop and demonstrate an innovative location and navigation solution for the automation of the operations of straddle carriers in container terminals.	Fundacio eurecat	∇Agencia estatal consejo superior deinvestigaciones cientificas (CSIC); ∇Asociacion espanola de normalizacion; ∇Tredit sa; ∇Certh; ∇Nidec industrial automation iberia, s.a.; ∇Rina consulting spa; ∇Thessaloniki port authority sa;
LOGISTAR **Enhanced data management techniques for real time logistics planning and scheduling**	To allow effective planning and optimizing of transport operations in the supply chain by taking advantage of horizontal collaboration, relying on the increasingly real-time data gathered from the interconnected environment.	Universidad de la iglesia de deusto entidad religiosa	∇Agencia estatal consejo superior deinvestigaciones cientificas (CSIC); ∇Ahlers belgium nv; ∇Codognotto italia spa; ∇Dbh logistics it ag; ∇Dunavnet; ∇Genegis gi srl; ∇Mds transmodal limited; ∇Nestle uk ltd; ∇Preston solutions limited; ∇Semantic web company gmbh; ∇Software ag; ∇United biscuits (uk) limited; ∇University college cork - national university of ireland, cork; ∇Zailog srl consortile
LOGIST-IOT **SensorToCloud Technologies for Loss Prevention and Smart "Last Mile" Logistics Operations**	Mobile SensorToCloud platform that provides real-time monitoring of the conditions of the delivery (temperature, humidity and sealed doors) providing a tool to protect revenues, support compliance with cold chain and other transport regulations (by providing automatic feed of data) and increase efficiency.	Tertium technology srl	No other participant
MIT.LANDELIJK.RD.676.2018 **Circular IoT for Logistics**	This project will deliver a new generation of highly accurate GPS sensors based on IoT platform in logistics	Tripleore B.V.	∇Kinergizer B.V.
MIT.NOORD.HB.213.2018 **Feasibility study project "Aware": ship loading**	ForestWave wants to speed up the ships loading process by developing a unique combination of loading	ForestWave Navigation B.V.	No other participant

Rijksdienst voor Ondernemend Nederland	bridges, overhead cranes and a revolutionary hatch principle.		
MIT.ZUID.HB.695 Rainhill Rijksdienst voor Ondernemend Nederland	TripleOre wants to develop an integrated and automated data exchange system based on 'internet of things' technology (IoT), which adds value for all partners in the rail freight transport chain.	Tripleore B.V.	No other participant
NEXTTRUST Building sustainable logistics through trusted collaborative networks across the entire supply chain NeXTrust	To increase efficiency and sustainability in logistics by developing interconnected trusted collaborative networks along the entire supply chain. These trusted networks, built horizontally and vertically, will fully integrate shippers, LSPs and intermodal operators as equal partners.	Tx logistik ag	∇2 degrees limited; ∇Alpega; ∇Arcese trasporti spa; ∇Beiersdorf ag; ∇Bluewave gmbh; ∇Borealis l.a.t gmbh; ∇Critt transport et logistique; ∇Colruyt group services; ∇Dreamland; ∇Elupeg limited; ∇Etablissementen franz colruyt nv; ∇Etablissements delhaize freres et cie le lion groupe delhaize sa; ∇Evo bv; ∇Fiege logistik stiftung & co. Kg; ∇Giventis international bv; ∇Greenyard frozen Belgium; ∇Gs1 belgium & luxembourg vzw; ∇Gs1 germany gmbh; ∇Gs1 schweiz; ∇Kimberly-clark europe limited; ∇Kneppelhout & korthals nv; ∇Mondelez european business services centre sro; ∇Norwegian logistics as; ∇Panasonic europe ltd;∇Pastu consult; ∇Pinguin foods polska sp zoo;∇Scala consulting limited; ∇Stichting vu; ∇Tri-vizor nv; ∇Unilever; ∇Vlerick business school;∇Wenzel logistics gmbh; ∇Ysco nv
NÖKS II Short sea shipping in Öresund-Kattegat-Skagerak NÖKS rejäfart i Öresund-Kattegatt-Skagen	The project's main objective is to contribute to a more environmentally friendly and low-carbon transport system in the region, while also developing and enhancing the maritime transport system and encouraging the transfer of freight from road to sea.	SSPA Sweden AB	∇Aalborg Havn A/S; ∇Aalborg universitet; ∇Arctic group A/S; ∇Borg Havn IKS; ∇Grenland Havn IKS; ∇KONGSBERG AS; ∇KRISTIANSAND HAVN KF; ∇Kystverket (Norwegian Coastal Administration); ∇Larvik Havn KS; ∇Maritimt Forum; ∇Norlines AS; ∇Port of Aalborg Business Intelligence ApS; ∇Royal Arctic Logistics A/S; ∇Svenskt Marintekniskt Forum; ∇Swedish Maritime Administration; ∇Vest-Agder Fylkeskommune; ∇Vestfold Fylkeskommune
North Sea CONNECT connecting north sea region's ten-t nodes - support intermodality growth in the north sea region through smart efficiency enhancements Interreg North Sea Region North Sea CONNECT European Regional Development Fund EUROPEAN UNION	To develop demonstrations of innovative and/or improved transport and logistics solutions with potential to move large volumes of freight away from long-distance road transportation.	Hamburg Institute of International Economics	∇Canal & River Trust; ∇Haven Oostende;∇inistry of Economic Affairs, Labour and Ports, Free Hanseatic City of Bremen; ∇Port of Brussels; ∇Port of Hamburg Marketing; ∇South East of Scotland Transport Partnership; ∇SSPA Sweden AB; ∇TECHNISCHE UNIVERSITEIT DELFT;∇University of Plymouth
OKTOPUS Optimization of logistics and disposition processes in the maritime transport chain through machine learning in steel logistics oktopus	The aim of this project is to check the usability of machine learning processes in maritime-based multimodal transport chains.	Fraunhofer e.v.	∇Haeger & Schmidt Logistics GmbH; ∇Hüttenwerke Krupp Mannesmann Gesellschaft mit beschränkter Haftung; ∇Imperial Shipping Services GmbH; ∇MECOMO AG; ∇proLOGiT GmbH; ∇thyssenkrupp Steel Europe AG
OMNISCIENT Prediction and optimisation platform for the mobile assets management	Prediction SaaS platform based on bespoke artificial intelligence, not only for inventory but also to allow the real-time mobile asset	Everysens	No other participant

HORIZON 2020 SME INSTRUMENT	localisation, management and accurate forecasting and planning to enhance operational efficiency in logistics		
OPTIMUM **Multi-source Big Data Fusion Driven Proactivity for Intelligent Mobility** optimum	OPTIMUM's goals will be achieved by incorporating and advancing state of the art in transport and traffic modeling, travel behavior analysis, sentiment analysis, big data processing, predictive analysis and real-time event-based processing, persuasive technologies and proactive recommenders.	Intrasoft international sa	∇Adria mobil proizvodnja, trgovina in storitve novo mesto doo; ∇Ait austrian institute of technology gmbh; ∇Birmingham city council;∇Tredit sa; ∇Ep estradas de portugal sa; ∇Fluidtime data services gmbh; ∇Infraestruturas de portugal sa; ∇Institut jozef stefan; ∇Institute of communication and computer systems; ∇Intrasoft international sa;∇Javno podjetje ljubljanski potniski promet d.o.o.; ∇Kapsch trafficcom ag; ∇Luis simoes logistica integrada sa; ∇Panepistimio aigaiou (uaegean); ∇Nissatech; ∇Regional environmental center for central and eastern europe -rec; ∇Tis pt, consultores em transportes, inovacao e sistemas, sa; ∇Uninova-instituto de desenvolvimento de novas tecnologias-associacao; ∇University of wolverhampton
OPUSS **Optimization of Urban Synchromodal Systems** ANR AGENCE NATIONALE DE LA RECHERCHE	The goal of the OPUSS project is to design advanced optimization algorithms to support the planning of synchromodal urban delivery networks.	IMT Atlantique Institut Mines-Telecom Atlantique Bretagne Pays de la Loire	∇Johannes Gutenberg University Mainz
PI-CO-MODALITY **Comodal freight transportation chains: a physical internet approach** ANR AGENCE NATIONALE DE LA RECHERCHE	To design co-modal chains in the freight transport according to environmental and economic objectives. The project is based on the concept of physical Internet which breaks with previous established approaches.	Inria	∇Armines (cgs); ∇Cnrs laas ; ∇Dhl
PI-NUTS **Physical InterNet cross-docking hUb conTrol System** PI-NUTS ANR	The project focuses on the study of an hybrid control architecture to manage a p-cross-docking hub. Based on Physical Internet instruments to fight the unsustainability symptoms in logistics on three points of view: - Unlocking significant gains in global logistics, production and transportation, reducing of the global energy consumption and of the direct and indirect pollution, enhancing the quality of life of the different actors (e.g. truckers, logistic workers…) implied in the logistic systems.	Laboratoire TEMPO	∇Armines (cgs); ∇Université laval cirrelt

PIXEL **Port IoT for Environmental Leverage**	Two-way collaboration of ports, multimodal transport agents and cities for optimal use of internal and external resources, sustainable economic growth and environmental impact mitigation, towards the Ports of the Future. PIXEL will leverage technological enablers to voluntary exchange data among ports and stakeholders.. The main outcome of this technology will be efficient use of resources in ports, sustainable development and green growth of ports and surrounding cities/regions.	Universitat politecnica de valencia	∇Cciaa di gorizia - azienda speciale per il porto di monfalcone; ∇Centre aquitain des technologies del'information et electroniques – catie; ∇Creocean; ∇Certh; ∇Grand port maritime de Bordeaux; ∇Insiel - informatica per il sistema degli enti locali s.p.a.; ∇Orange sa; ∇People technology solutions ltd; ∇Piraeus port authority sa; ∇Prodevelop; ∇Stazioni doganali autoportuali gorizia spa; ∇Sveuciliste u rijeci, medicinski fakultet; ∇Thessaloniki port authority sa; ∇Xlab razvoj programske opreme in svetovanje doo
PORTFORWARD **Towards a green and sustainable ecosystem for the EU Port of the Future**	The objective is to develop the port of the future, making it smart and green through ICT solutions.	Fraunhofer e.v.	∇Acciona construccion sa; ∇Acondicionamiento tarrasense associacion (leitat); ∇Aggregazione pubblico privata sulla logistica mare terra - mar.te. S.c.ar.l; ∇Autoridad portuaria de Baleares; ∇Autoridad portuaria de vigo; ∇Autorita di sistema portuale del mar tirreno settentrionale; ∇Brunel university London; ∇Core innovation and technology oe; ∇Interuniversitair micro-electronica centrum – imec; ∇Kristiansand havn kf; ∇Transportwerk magdeburger hafen gmbh; ∇Ubimax gmbh
PrEDICTS **Optimizing Container Load for Parcel and Pallet Transport Networks**	PrEDICTS is a cargo optimization software based on AI and machine learning.	Transmetrics ad	No other participant
SAFE-10-T **Safety of Transport Infrastructure on the TEN-T Network**	To develop a Safety Framework while allowing longer life-cycles for critical infrastructure across the road, rail and inland waterway modes. The SAFE-10-T project will provide a means of virtually eradicating sudden failures. The Safety framework will incorporate remote monitoring data stored in a BIM model that feeds into a decision support framework (DST) that enables decisions to be made automatically with maintenance prioritised for elements exhibiting stress. It will undertake demonstration projects at critical interchanges and nodes of the TEN-T transport network.	Gavin and doherty geosolutions ltd	∇Deutsches forschungszentrum fur kunstliche intelligenz gmbh (dkfi); ∇Forum des laboratoires nationaux europeens de recherche routiere; ∇Hz infrastruktura d.o.o.; ∇Infra plan konzaltnig jdoo za usluge; ∇Infrastructure management consultants gmbh; ∇Istituto di sociologia internazionale di gorizia isig; ∇Ministerie van infrastructuur en waterstaat; ∇Network rail infrastructure limited; ∇Roughan & o'donovan limited; ∇Sveuciliste u zagrebu gradevinski fakultet; ∇Technische universitat berlin; ∇Technische universiteit delft; ∇Virtus it limited

SATS **Move cargo from road to sea with autonomous ships** The Research Council of Norway	Enhancing the competitiveness of maritime shipping through autonomous systems, especially for environmentally friendly shipping and for maritime as a transport mode reducing the transport sectors total greenhouse gas emissions.	Sintef as	No other participant
Scandria®2Act **Sustainable and multimodal transport actions in the Scandinavian Adriatic Corridor** scandria®2	The project Scandria2Act successfully established a formal cooperation of regions at the Baltic Sea for modern transport along one of the nine European transport corridors, which will help those regions to contribute to shaping the corridor and to benefit from it economically in the long run.	Joint Spatial Planning Department Berlin-Brandenburg	∇Akershus county council; ∇Copenhagen business school; ∇Danmarks tekniske universitet; ∇Eastern norway county network;German energy agency (dena); ∇Hamburg logistics initiative; ∇Helsinki-uusimaa regional council; ∇Public transport authority berlin-brandenburg (vbb); ∇Region örebro county; Region skåne; ∇Rise research institutes of sweden ab; ∇Rostock port; ∇Skåne association of local authorities; ∇Swedish maritime administration; ∇Technical university of applied sciences wildau; ∇Turku science park ltd.; ∇University of turku
SELIS **Towards a Shared European Logistics Intelligent Information Space** SELIS	SELIS is aimed at delivering a 'platform for pan-European logistics applications' rmbracing a wide spectrum of logistics perspectives and creating a unifying operational and strategic business innovation agenda for pan European Green Logistics. It provides a 'lightweight ICT structure' to enable information sharing for collaborative sustainable logistics for all at strategic and operational levels.	Inlecom group	∇A.p. moller - mærsk a/s; ∇Adria kombi nacionalna druzba za kombinirami promet doo ljubljana; ∇Avanti communications ltd; ∇Bmt group ltd; ∇Business-e spa (part of maticmind) ; ∇Clecat - european association for forwarding, transport, logistics and customs service; ∇Clms (uk) limited; ∇Conex sa; ∇Dfds as; ∇Dhl; ∇Ebos technologies limited; ∇Electronic german link gmbh; ∇Elgeka ae emporio-dianomes-antiprosopies-biomichania; ∇Ellinikes apothikes sarantitis ae; ∇Elupeg limited; ∇Erasmus universiteit rotterdam; ∇Exmile solutions limited; ∇Farm.coop; ∇Fundacion zaragoza logistics center; ∇Havenbedrijf rotterdam nv; ∇I.s.p.c. gent; ∇Ibm ireland limited; ∇Information sharing company srl (gruppo isc); ∇Institute of communication and computer systems; ∇Institute of shipping economics and logistics (isl) ; ∇Mapotempo; ∇Marseille gyptis international; ∇Maticmind spa; ∇Nwl norddeutsche wasswereg logistik gmbh; ∇Pharma belgium sa; ∇Security projects uk limited; ∇Sintef as; ∇Sonae mc - servicos partilhados, sa; ∇Sumy belgium; ∇Technische universitaet dresden; ∇Trimodal logistik gmbh; ∇Universite libre de bruxelles; ∇Vltn gcv; ∇Wayz bv; ∇Zanardo servizi logistici spa (tiesse spa group)
SENSE **Accelerating the Path Towards Physical Internet** HORIZON 2020	SENSE aims to increase the level of understanding of PI concept and the opportunities that brings to transport and logistics.	Alliance for logistics innovation through collaboration in europe	∇Association pour la recherche et le developpement des methodes et processus industriels; ∇Bluegreen strategy srl; ∇Centro nacional de competencia en logistica integral - cnc-logistica; ∇Fit consulting srl; ∇Fm logistic corporate; ∇Fraunhofer e.v; ∇Interporto bologna spa; ∇Kühne logistics university gmbh;Netzwerk logistic; ∇Poste italiane - societa per azioni; ∇Procter & gamble services company nv; ∇Institute of logistics and warehousing; ∇Stichting tki logistiek (dinalog, dutch institute for advanced logistics); ∇Technische universiteit delft; ∇Vlaams instituut voor de logistiek vzw
SHOW **SHared automation Operating models for Worldwide adoption**	SHOW aims to support the migration path towards affective and persuasive sustainable urban	Union internationale des	∇Ait austrian institute of technology gmbh; ∇Artin spol. S r.o. ; ∇Austriatech gmbh; ∇Avl list gmbh; ∇Ballerup kommune; ∇Bax innovation consulting sl; ∇Bestmile sa;

	transport, through technical solutions, business models and priority scenarios for impact assessment, by deploying shared, connected, cooperative, electrified fleets of autonomous vehicles in coordinated Public Transport (PT), Demand Responsive Transport (DRT), Mobility as a Service (MaaS) and Logistics as a Service (LaaS) operational chains.	transports publics	∇Centre hospitalier universitaire de rennes; ∇Centrum dopravniho vyzkumu v.v.i. (transport research center v. V. I.); ∇Combitech ab; ∇Commissariat a l energie atomique et aux energies alternatives (cea); ∇Ctlup srl; ∇Danmarks tekniske universitet; ∇Deutsches zentrum fuer luft - und raumfahrt ev (dlr); ∇E.go moove gmbh; ∇Easymile; ∇Empresa municipal de transportes de madrid sa; ∇Ericsson; ∇Certh; ∇E-trikala ae; ∇Eurocities asbl; ∇Euromobilita sro; ∇European passengers' federation ivzw; ∇Ertico - its europe; ∇Fev europe gmbh; ∇Fondazione links - leading innovation & knowledge for society; ∇Fundacion tecnalia research & innovation; ∇Fzi research center for information technology; ∇Gruppo torinese trasporti s.p.a.; ∇Idiada automotive technology sa; ∇Iesta - institut fur innovative energie & stoffaustauschsysteme; ∇Indra sistemas sa; ∇Information technology for market leadership (itml); ∇Institut vedecom;∇Institute of communication and computer systems; ∇International road federation; ∇Irizar e-mobility sl; ∇Jrc -joint research centre-european commission; ∇Kapsch trafficcom ag;Keolis; ∇Virtual vehicle; ∇National technical university of athens - ntua; ∇Navya; ∇Tno; ∇Objective software italia srl (luxoft) ; ∇Pole de competitivite idforcar; ∇Rhein-neckar-verkehr gmbh; ∇Rise research institutes of sweden ab; ∇Robert bosch gmbh; ∇Salzburg research; forschungsgesellschaft m.b.h.; ∇Sensible 4 oy; ∇Siemens mobility gmbh; ∇Sitowise oy; ∇Societe des transports; intercommunaux de bruxelles ssf; ∇Stadt aachen; ∇Statens vag- och transportforskningsinstitut - vti; ∇Statutarni mesto brno; ∇Swarco mizar srl; ∇Tampereen kaupunki; ∇Vtt oy; ∇Trafikselskabet movia; ∇Transdev group; ∇T-systems international gmbh; ∇Universita degli studi di genova; ∇Universite de geneve; ∇Valeo vision sas; ∇Vrije universiteit brussel; ∇Wiener linien gmbh &co kg
SILKE **Safe food chain through the use of blockchain technology**	To facilitate the exchange of safety-related information in shortest possible time, a digital platform is developed, which incorporates simple and individualized data input, decentralized, forgery-proofed and transparent data storage together with context sensitive and selective data output.	RWTH Aachen	∇PSI Logistics GmbH; ∇QINUM GmbH; ∇Fraunhofer e.v; ∇Ftrace gmbh; ∇Fzi research center for information technology; ∇Hochschule niederrhein university of applied sciences
TENTacle **Capitalise on the core network corridors implementation for the prosperity, sustainable growth and territorial cohesion in the BSR**	To improve stakeholder capacity to reap benefits of the core network corridors implementation for the prosperity, sustainable growth and territorial cohesion in the BSR.	Region Blekinge	∇BTH Blekinge Institute of Technology; ∇City of Gdynia; ∇Danmarks tekniske universitet; ∇Guldborgsund Municipality; ∇Innovation Circle Network; ∇Institute of Shipping Economics and Logistics (ISL); ∇Lahti Region Development LADEC Ltd; ∇Municipality of Karlskrona; ∇Port of Gdynia Authority S.A; ∇Port of Hamburg Marketing; ∇Region Örebro County; ∇Region Skåne; ∇Regional Council of North Karelia; ∇Rostock Port; ∇Swedish Maritime Administration; ∇Transnorden Sweden; ∇Valga Town Government; ∇Värmland-Østfold Border Council; ∇Vidzeme Planning Region; ∇Vilnius

			Gediminas Technical University; ∇Westpomeranian Region
TEN-TaNS **TEN-T and the North Sea Region**	A toolbox of regional measures will be developed to optimise regional impact on TEN-T and freight transport development.	Aberdeenshire Council	∇Association of Danish Transport and Logistics Centres (FDT);∇Møre og Romsdal County Council; ∇Port of Hamburg Marketing; ∇Region Örebro County; ∇The Flemish Ministry of Mobility and Public Works (MOW); ∇Transport Research Institute
TRAXEN Tracking **Ultra low power, long life tracking sensor**	Introducing a novel, miniaturized, decade long life tracking solution for the logistics industry to be able to track each of their pallets, containers, trailers, wagons, boxes.	Akkucomp hungary korlatolt felelossegu tarsasag	No other participant
TT **Transforming Transport**	The TransformingTransport project will demonstrate, in a realistic, measurable, and replicable way the transformations that Big Data will bring to the mobility and logistics market.	Indra sistemas sa	∇Administrador de infraestructuras ferroviarias; ∇Aegean airlines ae; ∇Airport gurus sl; ∇Answaretech sl; ∇Athens international airport s.a. ; ∇Athens university of economics and business - research center; ∇Atos spain sa; ∇Autoaid gmbh; ∇Ayuntamiento de valladolid; ∇Boeing research & technology europe s.l.u.; ∇Cefriel societa consortile a responsabilita limitata; ∇Centro de innovacion de infraestructuras inteligentes; ∇Cintra servicios de infraestructuras sa (part of ferrovial); ∇Csp iberian valencia terminal sausa (cosco shipping); ∇Duisburger hafen ag - duisport; ∇Ferrovial agroman sa; ∇Fraunhofer e.v; ∇Fundacion cartif; ∇Fundacion valenciaport; ∇Grupo lince asprona s.l.u.; ∇Information technology for market leadership (itml) ; ∇Infotripla oy; ∇Instituto tecnologico de aragon - itainnova; ∇Instituto tecnologico de informatica - iti; ∇Intrasoft international sa; ∇J.a.m. de rijk bv-jan de rijk logistics; ∇Jeppesen gmbh; ∇Logika apothikefseis emporevmaton monoprosopi etaireia periorismenis eythinis; ∇Mattersoft oy;National university of ireland galway; ∇Network rail infrastructure limited; ∇Orbita ingenieria s.l.; ∇Paradigma digital sl; ∇Ptv planung transport verkehr ag.; ∇Societa per azioni esercizi aeroportuali sea spa; ∇Sofleet; ∇Software ag; ∇Taipale telematics oy; ∇Tampereen kaupunki; ∇Vtt oy; ∇Thales ground transportation systems uk ltd; ∇Thales six gts france sas; ∇Thales españa grp s.a; ∇Tomtom technology germany gmbh; ∇Universidad politecnica de madrid; ∇Universitaet duisburg-essen; ∇University of southampton
VALUE2SEA	Increase the environmentally friendly transport in selected corridors, including the core TEN-T network as well as around urban areas.	Aalborg universitet	∇Arctic group A/S; ∇Arendal Havn; ∇Asko as; ∇Borg Havn IKS; ∇Chalmers tekniska hoegskola ab; ∇Fjord Line; ∇Grenland Havn IKS; ∇Hirtshals Havn; ∇Integrate AS; ∇Jula AB; ∇Kristiansand havn kf; ∇Larvik Havn KS; ∇Marcod; ∇Moss Havn; ∇SSPA Sweden AB; ∇Universitetet i Sørøst-Norge; ∇Vendelbo Spedition; ∇Vestfold Fylkeskommune
VITALNODES **Building a lasting expert network that delivers evidence-based recommendations for Vital Urban Nodes along TEN-T Corridors**	VitalNodes will deliver evidence-based recommendations for more (cost) efficient and sustainable integration of all 88 urban nodes in the TEN-T network corridors, addressing specifically the	Ministerie van infrastructuur en waterstaat	∇Ecorys nederland bv; ∇Eurocities asbl; ∇Interregional alliance for the rhine-alpine corridor evtz; ∇Polis - promotion of operational links with integrated services, association international; ∇Rupprecht consult-forschung & beratung gmbh; ∇Trafikverket – trv; ∇Uiv urban innovation vienna gmbh; ∇Uniresearch bv; ∇Vlaamse gewest

VITAL NODES	multi- and intermodal connection between long-distance and last-mile freight logistics.		
ZELEROS HYPERLOOP levitation and propulsion subsystems for sustainable high-speed magnetic levitation hyperloop system HORIZON 2020 SME INSTRUMENT	Optimizing the very high cost of the infrastructure construction, the manufacture of vehicles and the improvement of the internal systems of the vehicle for the future complete scalability of the Hyperloop concept while ensuring the safety of passengers and cargo.	Zeleros global sl	No other participant
Blockchain Technology Used for Maritime Offshore Logistics - Norwegian Oil and Gas Supply Chain and Logistics Digitization. AkerBP	The main aim is to investigate the requirements for the Blockchain application to the Maritime Offshore Industry, combining it with IoT and digital twin.	Aker bp asa	No other participant
Low cost and flexible delivery and freight solutions which are social The Research Council of Norway	Building an API based platform, which front end plus other users (Retail, public sector, transport providers etc) can connect, developing generic APIs built on common standards which as their ultimate end has the facilitation of a physical internet. Identification of the best solution for the API-based platform for facilitating wide use and seamless integration between participants in the transport chain.	Carrycut as	No other participant
Short Sea Pioneer logistics system and ship concept development The Research Council of Norway	The project aims to develop an energy-efficient, low-emission logistics system for cargo transport, enabled through the Short Sea Pioneer (SSP) concept.	North sea container line as	No other participant
ParcelVision cross-border e-commerce Innovate UK	ParcelVision is a cloud based shipping platform that helps retailers and e-commerce providers reduce transportation costs by up to 80% and manage their logistics from the point of collection through to delivery.	Parcelvision Limited	No other participant
ParcelVision Retail Innovate UK	ParcelVision is a cloud based shipping platform that helps retailers and e-commerce providers reduce	Parcelvision Limited	No other participant

	transportation costs by up to 80% and manage their logistics from the point of collection through to delivery.		

Annex II: Stakeholders List from European/National Projects Analysis

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider	Hubs and Terminals	Infrastructure Owners	Infrastructure Operator	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Cluster	Sector Association	ICT & Liability Association
2 DEGREES LIMITED	x										
A.P. Moller - Mærsk A/S				x	x	x					
Aalborg Havn A/S		x									
Aalborg universitet	x										
Aberdeenshire Council									x		
ACONDICIONAMIENTO TARRASENSE ASSOCIACION (Leitat)	x										
ADMINISTRADOR DE INFRAESTRUCTURAS FERROVIARIAS			x								
ADRIA KOMBI NACIONALNA DRUZBA ZA KOMBINIRAMI PROMET DOO LJUBLJANA						x					
AGENCIA ESTATAL CONSEJO SUPERIOR DEINVESTIGACIONES CIENTIFICAS	x										
AHLERS BELGIUM NV				x							
AIMSUN SL	x										
AIRBUS	x										
AIRMIZ AB	x										
AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH	x										
Akershus County Council								x			
AKKUCOMP HUNGARY KORLATOLT FELELOSSEGU TARSASAG	x										
ALLIANCE FOR LOGISTICS INNOVATION THROUGH COLLABORATION IN EUROPE	x										
ALPEGA	x										
ANSWARETECH SL	x										
ARCESE TRASPORTI SPA				x	x	x					
Arctic group A/S				x	x	x					
Arendal Havn		x									
ARMINES (CGS) ARMINES Centre de Gestion Scientifique de Mines ParisTech	x										
ARRIVAL LTD	x										
ARTIN SPOL. S R.O.	x										
ASKO AS						x					
ASOCIACION ESPANOLA DE NORMALIZACION											x
Association of Danish Transport and Logistics Centres (FDT)										x	
Association of Danube River Municipalities "Danube" (ADRM)										x	
ASSOCIATION POUR LE DEVELOPPEMENT DE LA FORMATION PROFESSIONNELLE DANSLES TRANSPORTS										x	
ATHENS INTERNATIONAL AIRPORT S.A.		x									
ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS - RESEARCH CENTER	x										
ATOS SPAIN SA	x										
AUSTRIATECH - GESELLSCHAFT DES BUNDES FUR TECHNOLOGIEPOLITISCHE MASSNAHMEN GMBH	x										
AUTOAID GMBH	x										
AUTOBAHNEN- UND SCHNELLSTRASSEN-FINANZIERUNGS-AKTIENGESELLSCHAFT			x								
AUTORIDAD PORTUARIA DE BALEARES									x		
AUTORIDAD PORTUARIA DE VIGO									x		
AUTORITA DI SISTEMA PORTUALE DEL MAR LIGURE ORIENTALE									x		
AUTORITA DI SISTEMA PORTUALE DEL MAR TIRRENO SETTENTRIONALE									x		

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
AVANTI COMMUNICATIONS LTD	x										
AVL LIST GMBH	x										
AYUNTAMIENTO DE VALLADOLID								x			
BALLERUP KOMMUNE								x			
BESTMILE SA	x										
BIRMINGHAM CITY COUNCIL									x		
BLUE LINE LOGISTICS						x					
BOEING RESEARCH & TECHNOLOGY EUROPE S.L.U.	x										
Borg Havn IKS		x									
BRUNEL UNIVERSITY LONDON	x										
BTH Blekinge Institute of Technology	x										
BUNDESVERBAND GUTERKRAFTVERKEHR LOGISTIK UND ENTSORGUNG (BGL EV)										x	
BUREAU VERITAS MARINE & OFFSHORE REGISTRE INTERNATIONAL DE CLASSIFICATION DE NAVIRES ET DE PLATEFORMES OFFSHORE											x
BUSINESS-E SPA (Part of Maticmind)	x										
CARRYCUT AS	x										
CEFRIEL SOCIETA CONSORTILE A RESPONSABILITA LIMITATA	x										
CENTRE AQUITAIN DES TECHNOLOGIES DEL'INFORMATION ET ELECTRONIQUES - CATIE	x										
CENTRE D ETUDES ET D EXPERTISE SUR LES RISQUES L ENVIRONNEMENT LA MOBILITE ET L AMENAGEMENT - CEREMA									x		
CENTRE INTERNACIONAL DE METODES NUMERICS EN ENGINYERIA - CIMNE	x										
CENTRO RICERCHE FIAT SCPA	x										
CENTRUM DOPRAVNIHO VYZKUMU v.v.i. (Transport Research Center v. V. I.)	x										
CERTH	x										
CHALMERS TEKNISKA HOEGSKOLA AB	x										
CIRCLE SPA	x										
City of Gdynia								x			
CITYDEPOT		x			x	x					
Clecat - European Association for Forwarding, Transport, Logistics and Customs Service										x	
CLMS (UK) LIMITED	x										
CNRS LAAS	x										
CODOGNOTTO ITALIA SPA				x	x	x					
COLLECTE LOCALISATION SATELLITES	x										
COLRUYT GROUP SERVICES				x		x	x				
COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (CEA)	x										
COMUNE DI TORINO								x			
COMUNE DI VERONA								x			
CONEX SA	x										
CONSORCI CENTRE D'INNOVACIO DEL TRANSPORT	x										
CONTSHIP ITALIA SPA					x						
COOP LOGISTIK AB						x					
CORE INNOVATION AND TECHNOLOGY OE	x										

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
CREO DYNAMICS AB (now Faurecia Creo AB)	x										
CREOCEAN			x								
CRITT TRANSPORT ET LOGISTIQUE	x										
CSP IBERIAN VALENCIA TERMINAL SAUSA (COSCO SHIPPING)		x			x	x					
CTLUP SRL	x										
Cyberowl Limited	x										
DAF TRUCKS NV	x										
DANMARKS TEKNISKE UNIVERSITET (DTU)	x										
dbh Logistics IT AG	x										
DE VLAAMSE WATERWEG NV									x		
DEUTSCHE BAHN AG					x	x	x				
DEUTSCHES FORSCHUNGSZENTRUM FUR KUNSTLICHE INTELLIGENZ GMBH (DKFI)	x										
DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV (DLR)	x										
DFDS AS	x	x		x	x	x	x				
DHL				x	x	x	x				
DOTVISION	x										
DUISBURGER HAFEN AG - DUISPORT			x		x						
DUNAVNET	x										
Durres Port Authority		x									
DYNNIQ NEDERLAND BV	x										
Eastern Norway County Network								x			
EASYMILE	x										
EBOS TECHNOLOGIES LIMITED	x										
EP ESTRADAS DE PORTUGAL SA			x								
ERICSSON	x										
ERTICO - ITS EUROPE										x	
EUROCITIES ASBL										x	
EUROPEAN COUNCIL OF TRANSPORT USERS (EUROPEAN SHIPPERS COUNCIL)									x		
EVERYSENS	x										
EVO BV										x	
EXMILE SOLUTIONS LIMITED	x										
Ferrocarrils de la Generalitat de Catalunya						x					
FERROVIAL AGROMAN SA			x								
FIEGE LOGISTIK STIFTUNG & CO. KG				x							
Finnish Transport Agency			x								
Fjord Line						x	x				
FLUIDTIME DATA SERVICES GMBH	x										
FM LOGISTIC CORPORATE				x	x	x					
ForestWave Navigation B.V.						x					
FORUM DES LABORATOIRES NATIONAUX EUROPEENS DE RECHERCHE ROUTIERE										x	

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
FRAUNHOFER E.V.	x										
Freeport of Budapest Logistics			x								
fTRACE GmbH	x										
FUNDACIO EURECAT	x										
FUNDACION CARTIF	x										
FUNDACION TECNALIA RESEARCH & INNOVATION	x										
FUNDACION VALENCIAPORT	x										
FUNDACION ZARAGOZA LOGISTICS CENTER	x										
FZI Research Center for Information Technology	x										
GAVIN AND DOHERTY GEOSOLUTIONS LTD	x										
GEMEENTE ROTTERDAM								x			
GENEGIS GI SRL	x										
GIVENTIS INTERNATIONAL BV	x										
GRAND PORT MARITIME DE BORDEAUX		x									
Grenland Havn IKS		x									
GRIFF AVIATION AS	x										
Guldborgsund Municipality								x			
Győr-Sopron-Ebenfurth Railway			x				x				
Haeger & Schmidt Logistics GmbH		x		x	x	x	x				
Hamburg Logistics Initiative										x	
HAMBURG PORT AUTHORITY		x									
HAN University of Applied Sciences	x										
Haven Oostende		x									
HAVENBEDRIJF ANTWERPEN		x									
HAVENBEDRIJF ROTTERDAM NV		x									
HAW Hamburg	x										
HEATHROW AIRPORT LIMITED			x								
HEC GmbH	x										
Hellenic Federation of Road Transports										x	
Helsinki-Uusimaa Regional Council									x		
Hirtshals Havn		x									
HITACHI RAIL STS SPA	x										
HOUSE OF LOGISTICS & MOBILITY (HOLM) GMBH										x	
HZ INFRASTRUKTURA D.O.O.			x								
IBM IRELAND LIMITED	x										
ICT AUTOMATISERING NEDERLAND BV	x										
IDP INGENIERIA Y ARQUITECTURA IBERIA SL	x										
IESTA - INSTITUT FUR INNOVATIVE ENERGIE & STOFFAUSTAUSCHSYSTEME	x										
IHORKS SHIPPING AND TRADING SRL						x					
Imperial Shipping Services GmbH						x					

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
IMT Atlantique Institut Mines-Telecom Atlantique Bretagne Pays de la Loire	x										
INDRA SISTEMAS SA	x										
INFORMATION SHARING COMPANY SRL (Gruppo ISC)	x										
INFORMATION TECHNOLOGY FOR MARKET LEADERSHIP (ITML)	x										
INFOTRIPLA OY	x										
INFRAESTRUTURAS DE PORTUGAL SA			x								
INLECOM GROUP	x										
INNOVATRAIN AG					x						
INRIA	x										
INSIEL - INFORMATICA PER IL SISTEMA DEGLI ENTI LOCALI S.P.A.	x										
INSTITUT VEDECOM	x										
Institute for Transport and Logistics Foundation										x	
INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS	x										
Institute of Logistics and Warehousing	x										
Institute of Logistics and Warehousing (ILiM)									x		
Institute of Shipping Economics and Logistics (ISL)	x										
INSTITUTO TECNOLOGICO DE ARAGON - ITAINNOVA	x										
Integrate AS	x										
INTERNATIONAL ROAD FEDERATION										x	
INTERPORTO BOLOGNA SPA		x			x						
INTERREGIONAL ALLIANCE FOR THE RHINE-ALPINE CORRIDOR EVTZ									x		
INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM - IMEC	x										
INTRASOFT INTERNATIONAL SA	x										
IRU PROJECTS ASBL										x	
ISKRATEL	x										
ISTITUTO SUPERIORE MARIO BOELLA SULLE TECNOLOGIE DELL'INFORMAZIONE E DELLE TELECOMUNICAZIONI ASSOCIAZIONE	x										
Itemis AG	x										
J.A.M. DE RIJK BV (Jan de Rijk Logistics)				x	x	x	x				
Jeppesen GmbH	x										
Johannes Gutenberg University Mainz	x										
Joint Spatial Planning Department Berlin-Brandenburg									x		
JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION									x		
KAPSCH TrafficCom AG	x										
KINE ROBOT SOLUTIONS OY	x										
Kinergizer B.V.	x										
KNEPPELHOUT & KORTHALS NV											x
KONGSBERG AS	x										
KRISTIANSAND HAVN KF		x									
Kroop & Co. Transport + Logistik GmbH					x	x	x				
KTI Institute for Transport Sciences Non-Profit Ltd.	x										

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
KUEHNE+NAGEL SOCIETE ANONYME FOR TRANSPORTS & LOGISTICS				x	x						x
Kühne Logistics University GmbH	x										
Kystrederiene (Norwegian coastal shipowners)										x	
Kystverket (Norwegian Coastal Administration)									x		
Larvik Havn KS		x									
LOGIKA APOTHIKEFSEIS EMPOREVMATON MONOPROSOPI ETAIREIA PERIORISMENIS EYTHINIS				x	x						
LOGISTICS LANDSCAPERS				x							
LOGIT ONE NV	x										
LOJIKA BILGI TEKNOLOJILERI VE SERVISLERI TICARET AS	x										
LUIS SIMOES LOGISTICA INTEGRADA SA					x	x					
Luka Koper, port and logistic system, public limited company		x									
MACOMI BV	x										
Mapotempo	x										
Maritimt Forum										x	
MARLO AS	x										
MARSEILLE GYPTIS INTERNATIONAL	x										
MASSTERLY AS	x										
MATICMIND SPA	x										
MATRIC TERMINALS					x						
MATTERSOFT OY	x										
MECOMO AG	x										
MINISTERIE VAN INFRASTRUCTUUR EN WATERSTAAT									x		
Ministry of Economic Affairs, Labour and Ports, Free Hanseatic City of Bremen									x		
MINISTRY OF INFRASTRUCTURE, TRANSPORT AND NETWORKS									x		
MOBY X SOFTWARE LIMITED	x										
Møre og Romsdal County Council									x		
MOSAIC FACTOR SL	x										
Moss Havn		x									
Municipality of Karlskrona								x			
NALLIAN	x										
NATIONAL TECHNICAL UNIVERSITY OF ATHENS - NTUA	x										
NATIONAL UNIVERSITY OF IRELAND GALWAY	x										
NAVYA	x										
NEC LABORATORIES EUROPE GMBH	x										
NEO GLS	x										
NETPORT SCIENCE PARK										x	
NETWORK RAIL INFRASTRUCTURE LIMITED			x								
NETZWERK LOGISTIK										x	
NEW GENERATION SENSORS SRL	x										
New railway line Dresden – Prague EGTC									x		

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
NISSATECH	x										
NOKIA SOLUTIONS AND NETWORKS GMBH &CO KG	x										
Norlines AS						x	x				
NORTH SEA CONTAINER LINE AS						x					
Norwegian Maritime Authority - Sjofartsdirektoratet		x									
NOVACOM SERVICES SA	x										
NTEX AB						x					
NTNU	x										
OBJECTIVE SOFTWARE ITALIA SRL (LUXOFT)	x										
ORANGE SA	x										
ORBITA INGENIERIA S.L.	x										
OXFORDSHIRE COUNTY COUNCIL									x		
PANEPISTIMIO AIGAIOU (UAegean)	x										
PARADIGMA DIGITAL SL	x										
Parcelvision Limited	x										
PEOPLE TECHNOLOGY SOLUTIONS LTD	x										
PHARMA BELGIUM SA						x					
Piraeus Container Terminal S.A.					x						
PIRAEUS PORT AUTHORITY SA		x									
Ploče Port Authority		x									
POLIS - PROMOTION OF OPERATIONAL LINKS WITH INTEGRATED SERVICES, ASSOCIATION INTERNATIONALE										x	
Port of Aalborg Business Intelligence ApS		x									
Port of Bar Holding company		x									
Port of Brussels		x									
Port of Gävle		x									
Port of Gdynia Authority S.A		x									
Port of Hamburg Marketing		x									
Port of Rauma Ltd		x									
POSTE ITALIANE - SOCIETA PER AZIONI				x		x					
PRESTON SOLUTIONS LIMITED	x										
PRODEVELOP	x										
proLOGIT GmbH	x										
PSI Logistics GmbH	x										
PTV PLANUNG TRANSPORT VERKEHR AG.	x										
PURELIH LIMITED	x										
QINUM GmbH	x										
Region Blekinge								x			
Region Örebro County								x			
Region Skåne								x			
Regional Council of North Karelia									x		

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
Regional Unit of Thesprotia/Region of Epirus								x			
RETE FERROVIARIA ITALIANA			x								
RINICOM LIMITED	x										
RISE RESEARCH INSTITUTES OF SWEDEN AB	x										
ROBERT BOSCH GMBH	x										
Rostock Port		x									
Royal Arctic Logistics A/S						x	x				
RWTH Aachen	x										
SALZBURG RESEARCH FORSCHUNGSGESELLSCHAFT M. B. H.	x										
SAMER & CO. SHIPPING SPA		x		x	x		x				x
Satakunta University of Applied Sciences	x										
Saxon Inland Ports Upper Elbe		x									
Saxon State Ministry of the Interior									x		
SDRUZENI AUTOMOBILOVYCH DOPRAVCU CESMAD BOHEMIA, ZS										x	
Sea Level Research Ltd	x										
SEABILITY LTD.	x			x							
SECURITY PROJECTS UK LIMITED											x
SEMANTIC WEB COMPANY GMBH	x										
SENSIBLE 4 OY	x										
SGS SOCIETE GENERALE DE SURVEILLANCE SA											x
SHOT LOGISTICS GmbH		x		x	x	x					
SIEMENS MOBILITY GMBH	x										
SIGNIFICANCE BV	x										
SINTEF AS	x										
SLOVENSKE ZELEZNICE DOO			x			x	x				
SOCIETA PER AZIONI AUTOSTRADA DEL BRENNERO (BRENNER-AUTOBAHN)			x								
SOCIETA PER AZIONI ESERCIZI AEROPORTUALI SEA SPA			x								
SOFLEET	x										
SOFTWARE AG	x										
South East Europe transport Observatory										x	
South East of Scotland Transport Partnership										x	
Sovereign Speed GmbH					x	x	x				
SSPA Sweden AB	x										
STADT AACHEN								x			
STADT ULM								x			
STATENS VAG- OCH TRANSPORTFORSKNINGSINSTITUT - VTI	x										
STATUTARNI MESTO BRNO								x			
STAZIONI DOGANALI AUTOPORTUALI GORIZIA SPA		x			x						
STEVECO OY				x	x						
STICHTING CONNEKT										x	

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
STICHTING SMART FREIGHT CENTRE										x	
STICHTING TKI LOGISTIEK (Dinalog, Dutch Institute for Advanced Logistics)										x	
SUMY BELGIUM					x	x					
SWARCO MIZAR SRL	x										
Swedish Maritime Administration									x		
TAIPALE TELEMATICS OY	x										
TAMPEREEN KAUPUNKI								x			
Technical University of Applied Sciences Wildau	x										
TECHNISCHE UNIVERSITAET DRESDEN	x										
TECHNISCHE UNIVERSITAT BERLIN	x										
TECHNISCHE UNIVERSITEIT DELFT	x										
TECHNISCHE UNIVERSITEIT EINDHOVEN	x										
TERMINAL INTERMODALE DI TRIESTE FERNETTI SPA		x			x						
TERTIUM TECHNOLOGY SRL	x										
THALES	x										
The Flemish Ministry of Mobility and Public Works (MOW)									x		
THE UNIVERSITY OF NORTHAMPTON HIGHER EDUCATION CORPORATION	x										
Thessaloniki Port Authority SA		x									
TNO	x										
TOMTOM TECHNOLOGY GERMANY GMBH	x										
TRAFIKVERKET - TRV									x		
Transimeksa Intermodal GmbH						x	x				
TRANSMETRICS AD	x										
Transnorden Sweden										x	
TRANSPORT & MOBILITY LEUVEN NV	x										
Transport Research Institute	x										
TRANSPORTWERK MAGDEBURGER HAFEN GMBH					x						
TRELLEBORGS HAMN AB		x									
TRIMODAL LOGISTIK GMBH						x					
Tripleore B.V.	x										
Trondheim Havn		x									
T-SYSTEMS INTERNATIONAL GMBH	x										
TX LOGISTIK AG						x					
UNION DES INDUSTRIES FERROVIAIRES EUROPEENNES - UNIFE										x	
UNION INTERNATIONALE DES CHEMINS DE FER										x	
UNION INTERNATIONALE DES SOCIETES DE TRANSPORT COMBINE RAIL-ROUTE SCRL										x	
UNION INTERNATIONALE DES TRANSPORTS PUBLICS										x	
UNIVERSIDAD DE LA IGLESIA DE DEUSTO ENTIDAD RELIGIOSA	x										
UNIVERSIDAD POLITECNICA DE MADRID	x										
Università degli Studi di Cagliari - Dipartimento Scienze Economiche e Aziendali - CIREM	x										

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
UNIVERSITA DEGLI STUDI DI GENOVA	x										
UNIVERSITAET DUISBURG-ESSEN	x										
UNIVERSITAET ULM	x										
UNIVERSITAT POLITECNICA DE VALENCIA	x										
Université Laval CIRRELT	x										
UNIVERSITY COLLEGE LONDON	x										
UNIVERSITY OF WOLVERHAMPTON	x										
Ústí Region								x			
VALEO VISION SAS	x										
Valga Town Government								x			
Värmland-Østfold Border Council									x		
Vendelbo Spedition				x		x	x				
Vessel Traffic Services Finland	x										
Vest-Agder Fylkeskommune								x			
Vestfold Fylkeskommune								x			
Viadonau – Österreichische Wasserstraßen-Gesellschaft mbH									x		
Vidzeme Planning Region								x			
Vilnius Gediminas Technical University	x										
VIRTUAL VEHICLE	x										
VIRTUS IT LIMITED	x										
VLAAMS INSTITUUT VOOR DE LOGISTIEK VZW										x	
VLAAMSE GEWEST								x			
VLTN GCV	x										
VOLVO TECHNOLOGY AB	x										
VTT Oy	x										
WABCO	x										
WAYZ BV	x										
WENZEL LOGISTICS GMBH					x	x					
Westpomeranian Region								x			
WIENER LINIEN GMBH &CO KG			x								
WORLD PROFESSIONAL SERVICES SRLS. R.L (Teamnet Group)	x										
WORLDWIDE FLIGHT SERVICES BELGIUM NV			x								
XLAB RAZVOJ PROGRAMSKE OPREME IN SVETOVANJE DOO	x										
ZAILOG SRL CONSORTILE										x	
ZANARDO SERVIZI LOGISTICI SPA (TIESSE SPA GROUP)				x	x	x	x				
ZELEROS GLOBAL SL	x										

Annex III: Stakeholders List from Patents Analysis

Stakeholder Name	T&L Value Chain Actors							Other Involved Players			
	Technology Provider / Developer	Hubs and Ports	Infrastructure Service Provider	Shipper	Logistics Service Provider	Shipping Company	Fleet Owner	Member State	Regulator	Sector Association	TIC & Liability Company
CARGO BEE SOLUTIONS	x										
CONEXBIRD	x										
DAHER TECHNOLOGIES	x										
DEUTSCHE BAHN FERNVERKEHR					x	x	x				
DEUTSCHE POST DHL				x	x	x	x				
DIGITAL LOGISTICS (VOCA)	x										
ECIOTIFY GMBH (WEEVE)	x										
ERICSSON	x										
INVENTIVE COGS CAMPBELL LTD	x										
LOGIT SYSTEMS AS	x										
NALLIAN	x										
NOKIA	x										
OVINTO CVBA	x										
PSI TECHNICS	x										
ROBERT BOSCH GMBH	x										
SOFTWARE AG	x										
TAMTRON OY	x										
THALES	x										
VOLKSWAGEN AG	x										

Annex IV: Scouted patents

Table 11: List of relevant patents

Patent Title and ID	Publication Date	Description	Applicant
SYSTEM AND METHOD FOR COLLABORATIVE TASK OFFLOADING AUTOMATION IN SMART CONTAINERS **WOA1/202044353**	05/03/2020	System and method for automated offloading of smart containers based on an exchange of messages between two smart containers establishing a **smart contract** thanks to the use of **IoT and blockchain** technologies.	ERICSSON
METHOD FOR VERIFYING AN EXECUTION OF A COMPUTER PROGRAM **EPA1/3471006**	17/04/2019	Method and system to exchange and verify computerized data related to a **smart contract**. The invention uses **blockchain** to load, modify and approve the related documents to obtain the transaction.	ECIOTIFY GMBH (WEEVE)
APPARATUS AND METHOD FOR SHARING DATA IN A VALUE CHAIN COLLABORATION PROCESS **WOA1/202038705**	27/02/2020	Method, system and computer programme product for sharing data between nodes in transport and logistics value chain based on **blockchain smart contracts**.	NALLIAN
ANONYMITY SYSTEM FOR GOODS DELIVERY **WOA1/201981816**	02/05/2019	A system for goods delivery in which a **blockchain based smart contract** is generated, comprising cryptographic tokens to confirm the delivery and to complete the computerised transaction protocol.	NOKIA
METHOD FOR CONTROLLING, GUIDING AND MONITORING A ROAD TRANSPORT CONVOY AND DEVICES FOR IMPLEMENTING SAME **WOA1/201824918**	08/02/2018	System for guiding a convoy through a transport vehicle, which follow a planned route from a departure point to a deliver point, and a remote logistics monitoring centre. The critical points are solved by a **cloud-based** real time data exchange and **artificial intelligence** techniques.	DAHER TECHNOLOGIES
IMPROVED EVALUATION OF FILLING STATE IN CARGO TRANSPORT **EPA1/3511685**	17/07/2019	Filling system of a container or a transport vehicle (e.g. a ship) in which the system is equipped with **self-calibrating machine learning** that weighs the load acoustically.	OVINTO CVBA
Method and system for operating logistics chain **EPA1/2731064**	14/05/2014	The present invention relates to a method and a system for operating a logistics chain in which a plurality of transport units is handled by a plurality of services according to a plurality of orders. This handling is guided using **artificial intelligence**.	LOGIT SYSTEMS AS
TRANSFER CHECKING METHOD FOR TRANSPORT GOODS, MONITORING APPARATUS AND CENTRAL PROCESSING SYSTEM **WOA1/201860427**	05/04/2018	The invention relates to a method for checking correct transfer of a transport goods item to be transported at the destination. The central processing system may be a **cloud-based server environment** with one or more servers and a database.	CARGO BEE SOLUTIONS
A METHOD, SOFTWARE, AND AN APPARATUS FOR INSPECTION OF SHIPMENTS **WOA1/2017178712**	19/10/2017	Method and system to inspect a moving load or transport vehicle through **artificial intelligence** by detecting the specific weight distributions of the load. The data is transmitted in real time on a **cloud platform**. The data produced allows you to plan and optimize logistics, including routes and devices.	CONEXBIRD

Patent Title and ID	Publication Date	Description	Applicant
SYSTEMS AND/OR METHODS FOR SECURING AND AUTOMATING PROCESS MANAGEMENT SYSTEMS USING DISTRIBUTED SENSORS AND DISTRIBUTED LEDGER OF DIGITAL TRANSACTIONS **USA1/US20200097876**	26/03/2020	The patent describes a system and a method for securing and automating process management using distributed **Internet-of-Things (IoT) sensors** and distributed ledgers of digital transactions (e.g. **blockchains**) relating to the distributed processes being managed.	SOFTWARE AG
METHOD FOR OPERATING A LOADING FACILITY AND LOADING FACILITY **USA1/US20180128001**	10/05/2018	**Autonomous vehicle**, equipped with **smart sensors** and managed by computer programme, can drive itself towards loading site to optimise the logistics process.	ROBERT BOSCH GMBH
AN ARRANGEMENT AND A METHOD FOR IDENTIFYING AN OBJECT IN CONNECTION WITH TRANSPORTATION **EPA1/3540682**	18/09/2019	Arrangement and method for identifying an object in connection with transportation by utilizing image recognition. The data collected by the identification can form a **big data** type knowledge base for identifying various types of objects. **Artificial intelligence** can be applied to recognise objects from image data.	TAMTRON OY
METHOD FOR DELIVERING A SHIPMENT BY AN UNMANNED TRANSPORT DEVICE **USA1/US20170039510**	09/02/2017	Method for delivering a shipment by an **unmanned transport device** to a receiving container through geographical co-ordinates. The invention additionally relates to the unmanned transport device and to the receiving container, which are each designed to carry out the method.	DEUTSCHE POST
VEHICLE FOR THE AUTONOMOUS TRANSPORT OF AN OBJECT **USA1/US20190106167**	11/04/2019	Vehicle for the **autonomous transport** of an object to a destination, having a loading bed for receiving the object, a side wall extending longitudinally around the loading bed, a bounding a base area and a controller.	DEUTSCHE POST
CARGO DETECTION AND TRACKING **WOA1/2019151876**	08/08/2019	Present invention relates to recognition, identification, maintenance and handling of cargo in loading and unloading operation, typically used for offshore container tracking. This is allowed thanks to the use of **artificial intelligence**.	DIGITAL LOGISTICS (VOCA)
INSPECTION METHOD, DATA PROCESSING SYSTEM AND INSPECTION SYSTEM FOR INSPECTING A VEHICLE IN THE OPERATING STATE **WOA1/201887341**	17/05/2018	Inspection method for optically inspecting a vehicle in the operating state using an inspection system, which has a sensor arrangement and provides a passage for the vehicle during a relative movement between the vehicle and the sensor arrangement. As a result, the technical functional state of the vehicle can be optically inspected without the vehicle having to be stopped. This can save costs and increase the vehicle service time and adds new opportunities to existing inspection methods. The inspection method comprises a step of generating **Big Data** using the inspection result.	PSI TECHNICS DEUTSCHE BAHN FERNVERKEHR

Patent Title and ID	Publication Date	Description	Applicant
Method for carrying out distance measurements between the transportation vehicles of a vehicle convoy and transportation vehicle module for use in the method and transportation vehicle. **USA1/US20190195982**	27/06/2019	Automatic control of the distance between two or more goods or people transport vehicles through **intelligent sensors** and **algorithms** that reduce energy consumption during the journey.	VOLKSWAGEN AG
Driving of vehicles in a convoy **EPB1/2922040**	25/04/2018	Automatic control of the distance between two or more goods transport vehicles during the route through **sensors** and **algorithms** to make the transport of goods safe and avoid collisions in the presence of risks during the route.	THALES
VEHICLE ROUTE GUIDANCE **USA1/US20190346275**	14/11/2019	Method to determine the driving between two or more transport vehicles on a route between two locations with the objective of energy efficiency and punctuality during the trip. The invention uses stochastic **algorithms** to regulate speed during the journey and may also involve **autonomous transport vehicles**.	INVENTIVE COGS CAMPBELL LTD

Annex V: Template used for partners involvement in the concerns and needs identification

Stakeholder Analysis aims to identify the concerns and needs from all stakeholders that are relevant for PLANET. This will be done by combining desk research and inputs for partners to maximise the impact of communication activities and serves for the definition of exploitation actions.

The tool that will be used to collect information from partners is the **Value Proposition Canvas**[4]**.** This tool is a very useful tool to identify customer segments and the needs these customers have (customer segments) and at the same time, evaluate the proposed future exploitation strategy towards solving these needs (value proposition). From this analysis the core messages for these customers will be generated and, in combination with the results of the desk research, it will be possible to extrapolate these messages to the different stakeholders identified.

The Value Proposition Canvas:

The Value Proposition Canvas is represented in the following figure:

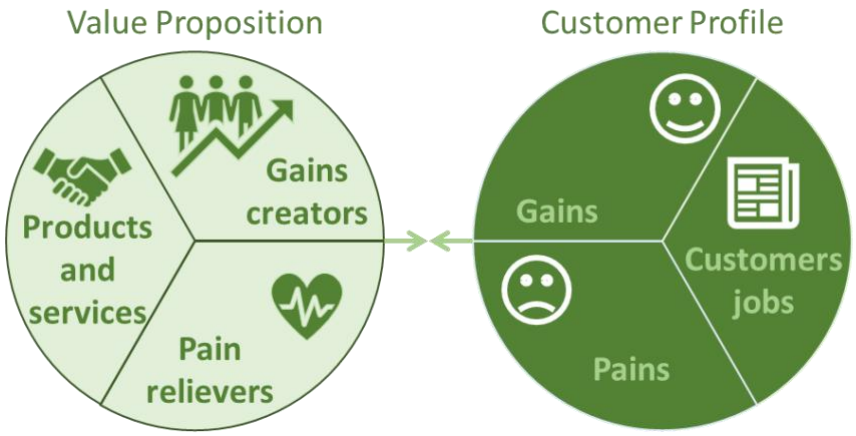

Figure 26: The Value Proposition Canvas (based on the original model from Strategyzer).

When bringing this to PLANET's stakeholder analysis, what is requested from partners is to provide the responses to the following sections of the Value Proposition Canvas as explained below, in order to clearly understand Stakeholders concerns and needs. The details about these six items and the inputs requested from partners to perform the assessment, are described in the following sections:

Customer Profile: Jobs

Describe what you as a potential customer are trying to get done at could be solved or provided by PLANET's solutions.

Questions you may ask to prepare this section:

- What are you trying get done? (e.g. perform a specific task, solve a specific problem, ...)
- What social jobs are you trying to get done? (e.g. trying to look good, gain power or status, ...)
- What emotional jobs are your trying get done? (e.g. security, improved performance, etc...)
- What basic needs are you trying to satisfy? (e.g. communication,...)

Please provide here your contributions:

[4] Strategyzer, The Value Proposition Canvas.

Customer Profile: Gains

Describe the benefits that you could expect/get from PLANET solutions in terms of flexibility, efficiency, competitiveness, etc. Rank each gain according to you. Is it substantial or is it insignificant? For each gain indicate how often it occurs.

Questions you may ask to prepare this section:

- Which savings would make your customer happy? (e.g. in terms of time, money and effort, ...)
- What outcomes does your customer expect and what would go beyond his/her expectations? (e.g. quality level, more of something, less of something, ...)
- How do current solutions delight your customer? (e.g. specific features, performance, quality, ...)
- What would make your customer's job or life easier? (e.g. flatter learning curve, more services, lower cost of ownership, ...)
- What positive social consequences does your customer desire? (e.g. makes them look good, increase in power, status, ...)
- What are customers looking for? (e.g. good design, guarantees, specific or more features, ...)
- What do customers dream about? (e.g. big achievements, big reliefs, ...)
- How does your customer measure success and failure? (e.g. performance, cost, ...)
- What would increase the likelihood of adopting a solution? (e.g. lower cost, less investments, lower risk, better quality, performance, design, ...)

Please provide here your contributions:

Customer Profile: Pains

Describe the negative emotions, undesired costs and situations, and risks you experience or could experience before, during, and after getting the job done.

Rank each pain according to the intensity it represents for your customer. Is it very intense or is it very light? For each pain indicate how often it occurs.

Questions you may ask to prepare this section:

- Is your business too costly? (e.g. takes a lot of time, costs too much money, requires substantial efforts, ...)
- Do you feel bad? (e.g. frustrations, annoyances, things that give them a headache, ...)
- How are current solutions underperforming encountered? (e.g. lack of features, performance, malfunctioning, ...)
- What are your main difficulties and challenges? (e.g. understanding how things work, difficulties getting things done, resistance, ...)
- What negative social consequences do you encounter or fear? (e.g. loss of face, power, trust, or status, ...)
- What risks do you fear? (e.g. financial, social, technical risks, or what could go awfully wrong, ...)
- What's keeping you awake at night? (e.g. big issues, concerns, worries, ...)
- What common mistakes do you make? (e.g. usage mistakes, ...)
- What barriers blocks you from integrating changes? (e.g. upfront investment costs, learning curve, resistance to change, ...)

Please provide here your contributions:

Value Proposition: Pain relievers

Imagine how PLANET's solutions may alleviate customer pains. How do they eliminate or reduce negative emotions, undesired costs and situations, and risks your customer experiences or could experience before, during, and after getting the job done?

Rank each pain reliever according to their intensity for you. Is it very intense or very light? For each pain indicate how often it occurs.

Questions you may ask to prepare this section:

- ... produce savings? (e.g. in terms of time, money, or efforts, ...);
- ... make you feel better? (e.g. kills frustrations, annoyances, things that give them a headache, ...);
- ... fix underperforming solutions? (e.g. new features, better performance, better quality, ...);
- ... put an end to difficulties and challenges? (e.g. make things easier, helping them get done, eliminate resistance, ...);
- ... wipe out negative social consequences you fear? (e.g. loss of face, power, trust, or status, ...);
- ... eliminate risks? (e.g. financial, social, technical risks, or what could go awfully wrong, ...);
- ... help you to better sleep at night? (e.g. by helping with big issues, diminishing concerns, or eliminating worries, ...);
- ... limit or eradicate common mistakes? (e.g. usage mistakes, ...);
- ... get rid of barriers? (e.g. lower or no upfront investment costs, flatter learning curve, less resistance to change, ...).

Please provide here your contributions:

Value Proposition: Gain creators

Describe how PLANET's solutions may create you gains. How does it create benefits you expect, desire or would be surprised by, including functional utility, social gains, positive emotions, and cost savings?

Rank each gain created by these PLANET solutions according to its relevance to you. Is it substantial or insignificant? For each gain indicate how often it occurs.

Questions you may ask to prepare this section:

- ...create savings that make you happy? (e.g. in terms of time, money and effort, ...);
- ... produce outcomes as planned or beyond expectations? (e.g. better-quality level, more of something, less of something, ...);
- ... copy or outperform current solutions that delight your customer? (e.g. regarding specific features, performance, quality, ...);
- ... make your job or life easier? (e.g. flatter learning curve, usability, accessibility, more services, lower cost of ownership, ...);
- ... create positive social consequences than your desires? (e.g. makes them look good, produces an increase in power, status, ...);
- ... do something you are looking for? (e.g. good design, guarantees, specific or more features, ...);

- ... fulfil something you are dreaming about? (e.g. help big achievements, produce big reliefs, ...);
- ... produce positive outcomes matching your success and failure criteria? (e.g. better performance, lower cost, ...);
- ... help make adoption easier? (e.g. lower cost, less investments, lower risk, better quality, performance, design, ...).

Please provide here your contributions:

Value Proposition: Products and services

Products and services are not included as part of these assessment, as what D5.1 deals with is with segmenting the PLANET stakeholders and understanding their needs.