

NEWSLETTER #1

June 2021

planet

PROGRESS TOWARDS FEDERATED LOGISTICS
THROUGH THE INTEGRATION OF TEN-T INTO A
GLOBAL TRADE NETWORK

COORDINATION

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COMMUNICATION

**FUNDACIÓN
VALENCIAPORT**

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What is the PLANET Project?

PLANET is a **36-month** research project, co-funded by the **Horizon 2020 Mobility for Growth Programme** (EU Horizon 2020 Programme).

33 participants from **14** countries including public, private and R&D companies

- Centre for Research and Technology Hellas
- COSCO SHIPPING Technology (Beijing) Co. Ltd.
- Comunidade Portuária de Sines
- Konnecta
- DHL Supply Chain Spain
- EBOS Technologies
- TEN-T Interregional Alliance for the Rhine-Alpine Corridor
- Erasmus University Rotterdam
- European Shippers Council
- CityLogin
- COSCO Shipping Lines Spain SA
- Fundación Valenciaport
- Fundación Zaragoza Logistics Center
- GS1 Poland
- HARDT HYPERLOOP
- IBM Ireland
- Inlecom
- International Union for Road-Rail Combined Transport
- INSTITUTO TECNOLÓGICO DE ARAGÓN
- Instytut Logistyki i Magazynowania
- Jing Dong Logistics
- New Generation Sensors
- NEWOPERA AISBL
- SIRMA AI
- PANTEIA
- PNO Innovation
- Blockchain Fieldlab B.V.
- Polish National Post
- ROHLIG SUUS LOGISTICS S. A
- VLTN
- Wuppertal Institute

- China Academy of Transportation Services
- GS1 China

PLANET VISION

To advance in the European Commission's strategy for **Smart, Green and Integrated Transport and Logistics** by

Efficiently interconnecting infrastructure (TEN-T, Rail-Freight Corridors) with geopolitical developments

Optimising the use of current & emerging transport modes and technological solutions:

- ensuring equitable inclusivity of all participants
- increasing the prosperity of nations
- preserving the environment
- enhancing Citizens quality of life

The PLANET vision is supported by **two key R&D pillars**:

1. Understanding and Assimilating Global, Geopolitical, Trade and Economic Imperatives

- Implications of new trade routes and how best to maximise the EU's economic prospects through steering best practices that align with EC regulatory and environmental policies;
- Support EU's strategic cooperation with China and USA and explore international cooperation, including peripheral regions and landlocked developing countries;
- Model multimodal transfer zones and global trade zones under the Assess concept of EU's Principal Entry Nodes.

2. Leveraging Technological Advancements and New Logistics Concepts

- Leverage and advance current state of the art towards the horizontal interoperability of T&L systems, and promote the development of European and worldwide standards for the purpose of optimising the interconnection of supply chains along the TEN-T Corridors to a "green" Global T&L context;
- Demonstrate Secure and Privacy-Preserving Logistics Data Sharing Infrastructures for Globally Interconnected Supply Chains, to increase confidence in their use and to automate complex supply chain processes;
- Leverage blockchain federation and interoperability for Supply Chain (SC) governance, immutable **auditability** in recording / reporting of Supply Chain transactions, also supporting smart contracts and regulatory activities.

The realization of this vision is what PLANET calls the **Integrated Green EU-Global T&L Network (EGTN)**, which are international logistics systems that: (1) make use of physical and digital infrastructures; (2) aim at operational excellence for customers and external stakeholders; (3) incorporate geo-economic context; (4) are enabled by (disruptive) transport & logistics concepts and technologies.

As we can see, the development of EGTN in PLANET encompasses **physical, technological and governance dimensions**. In this regard, **PLANET's mission** will be to provide knowledge and software assets to support its design and operation.

PLANET MISSION

To provide **knowledge** and **software assets supporting the design and operation of** Integrated Green Eu-Global T&L Networks

Knowledge Assets (analysis reports, models and roadmaps) for:

- efficiently interconnecting infrastructure (TEN-T, Rail-Freight Corridors) with existing and emerging trade routes [TEN-T Flows] and Legislation and EU policy to impact EGTN
- optimising End to End Supply chains in the context of specific corridors through synchromodality / PI models exploiting suitable incentives mechanisms and technological innovations [IoT, blockchain, smart contracts, automation and autonomous technologies, 5G, 3D printing, UAVs and hyperloop]

A Cloud-based Open EGTN Infrastructure integrating existing assets and Innovative EGTN Assets:

- EGTN Connectivity
- Industry blockchain Interoperability Layer / Blockchain Integrator
- Predictive and optimisation analytics EGTN Algorithms
- Smart Hubs / Intelligent PI Nodes



What are the project's objectives?

- A **Simulation Capability** to analyse the expected impact of new trade routes and emerging innovations on the TEN-T corridors and European logistics operations, as well as to design a geo-economics aware EU Global Trade Logistics Network [EGTN] inspired by the PI concept.
- The PLANET **Cloud-based Open EGTN ICT Infrastructure**, facilitating implementation of EGTNs by T&L corridor actors;
- An **Integrated Green EU-Global T&L Network Pilot** incorporating 3 global corridor Living Labs, each designed using the Simulation Capability and implemented utilising the Open EGTN support ICT Infrastructure.
- An **EU Roadmap and Capacity Building program** to accelerate the realisation of EGTN, combining the above knowledge and closely aligning with prominent T&L blockchain initiatives and the ALICE PI working groups.
- **Dissemination and Commercialisation Strategy Impact Assessment** and **Policy recommendations**.

Living Labs

PLANET will go beyond strategic transport studies and ICT for transport research, by rigorously demonstrating emerging concepts like the Physical Internet (PI), IoT applied to logistics, Blockchain and Predictive Analytics technologies in three EU-global real-world corridors (China – EU- US) with the objective of increasing the corridor's end-to-end visibility.

The project organises its activities around three Living Labs (LLs) that will concentrate their actions in different European sites. The LLs will contribute to the strategic analysis of global flows based on the corridors where they are located, the analysis of corridor infrastructure issues, and the investigation of integration of the respective global corridor with the TEN-T.

Furthermore, Living Labs will investigate innovative ways to coordinate complex supply chains through multimodal corridors involving private and public stakeholders.

An overview of the planned LLs can be found on the following page.

3 Living Labs

LL1 Asia-Europe Corridor

PI and Blockchain for optimised door-to-door Asia-Europe corridors – Mediterranean Corridor

Main Hubs

Valencia and Madrid

Focus on evaluating how new technologies (IoT, AI and blockchain) and concepts (PI) can improve warehouse and cargo processes and operations as well as efficiency along the door-to-door transport chains linking the Maritime Silk Road with EU internal corridors

LL2 Europe-America Corridor

Synchromodal dynamic management of TEN-T & intercontinental flows promoting rail transport

Main Hub

Rotterdam

Focus on dynamic and Synchromodal management of TEN-T & intercontinental flows promoting rail transport and utilising the Port of Rotterdam as the principal smart EGTN Node coordinating the rail focused transport chains linking China through Rotterdam to/from USA, and the Rhine-Alpine Corridor destinations

LL3 New Euroasian Land Bridge Economic Corridor

IoT for Silk Road Route – reliable, transparent and fully connected corridor from China to the EU

Main Hub

Malaszewicze

Focus on streamlining logistic processes in flows from China to Europe along the Silk Road Route by implementing IoT technologies (based on the EPCIS platform) and GS1 standards that facilitate transmission of data between the partners involved in the e-commerce operations

Expected results

The PLANET project will address the challenges of assessing the impact of emerging global trade corridors on the TEN-T network and ensuring effective integration of the European to the Global Network by demonstrating the use of emerging concepts of the PI and technologies such as the Internet of Things and blockchain in three EU–global real-world corridors (China–EU–US). As a result, is expected:

- a **better understanding of T&L innovation technologies, blockchain** to achieve improved corridors, **Industry 4.0** and **new warehousing automation technologies** on intelligent transport node decision-making;
- to **exploit such technologies to optimize stakeholder infrastructures and operations** within the new economic reality;
- to **increase economic, environmental, and societal benefits of T&L network.**

Project progress



PLANET's EU-Global T&L Networks [EGTN] work package making progress

During the first year of the PLANET project, significant progress has been achieved towards the goal of realising the Integrated Green EU-Global Trade & Logistics Network concept (EGTN). In the context of the first Work package, four Foundational Position Papers drafted by experienced project partners, provided an insight into the geo-economic dimensions of three emerging trade routes which are expected to impact the TEN-T while at the same time the most important types of these impacts were identified. The routes under consideration included the One Belt One Road maritime and land corridors, the Northern Sea route in the Arctic Cycle and the International North-South transport corridor connecting India to Russia through central Asia. In addition to the above, an analysis of current issues affecting the interconnection of the European rail network to the global network was performed, in view of the importance of land connections to the establishment of EGTN. Finally, the analysis detailed on the PI concept along with the innovative enabling technologies and their role in the development of EGTN.

The results from the Foundational Position Papers were consolidated towards drafting plausible future scenarios for the development of EGTN using a methodology developed within the project. The testing of these scenarios will use the project's integrated simulation and modelling capability and will help define the specifications for realising the EGTN. In order to be able to do so, a mapping of the available modelling and simulation capability of the project was also performed through a series of workshops, defining the possible connections and synergies between models of same or different types and orientation. This process will lead to the development of the integrated simulation and modelling capability in the next stages of the project.



The PLANET Cloud-based Open EGTN Infrastructure work package progresses work

Work Package 2 has seen significant progress across all the technical tasks assisted by strong lines of open communication with Work Package 1 (Simulation, Modelling & EGTN requirements) and Work Package 3 (Living Lab Scenarios). The foundational EGTN platform cloud infrastructure has been deployed and configured, including virtual machines, microservices and container orchestration elements and key nodes/API's for subsequent IoT and Blockchain integrations. The supporting data source framework layer based on Kafka and Spark has also been fully commissioned. Key advancements have been seen in the connectivity services layer of the platform architecture in terms of Knowledge Graph deployment and associated GQL API interface. EPCIS V1 data modelling is complete and EPCIS V2 modelling very near completion. The data transformation from EPCIS XML/JSON to connectivity service compatible RDF format is also well progressed.

The first mock-up for the Cloud IoT Platform integration with the EGTN platform is almost complete as is the research into improving the sensor device architecture for smart pallets and containers. In terms of Optimisation and Predictive Analytics, steady and increasing progress has been achieved through numerous workshops and discussions with key stakeholders. Data has been received and data pre-processing and routing code implementation has begun. Flow forecasting models have been improved and through collaboration with the

Living Lab actors, the Use Cases are evolving also for the supplier collaboration storyboards and blockchain interoperability/integration. The Multi-Actor Multi-Criteria Analysis task is researching auctioning methods, flow analysis models and the factorisation of network performance metrics. Also key to this task is examining MAMCA alternatives for technology and Physical Internet alignment. Investigations and research into Blockchain interoperability in Living Lab Use Cases is ongoing. Central to these investigations is the possible application of SOFIE interledger to enable secure transactions between participants and devices on different IoT platforms using different blockchains.

The HMI Interfaces (Dashboards) task to investigate and design unified interfaces for the different actors and data sources on the EGTN platform kicked off in earnest in May 2021. However, preparatory work and investigations related to this task were well in progress prior to that, so work there has certainly hit the ground running and is progressing at an energetic rate.



PLANET LLs provide the close-to-reality innovation environment for the project!

Our three real-world LLs have progressed in their current situation analysis and future specifications. The main needs and problems affecting the actors of global transport corridors and nodes have been identified, and PLANET team works jointly on the definition of tests based on new disruptive technologies and concepts proposed and supported by PLANET’s EGTN approach to overcome the selected problems.

The bases are being set to test the use of GS1 standards and IoT for a reliable, transparent, and connected Silk Road Route linking China with Poland, blockchain and other PI-related technologies and enablers for the maritime Asia-Spain and Mediterranean corridor, and a blockchain-enabled platform involving the Port of Rotterdam community and customers (and the potential of a Eurasian rail freight expansion) for enhanced synchromodality. Interesting times ahead for sure!



Dissemination, commercialisation and policy recommendations: The first PLANET Advisory Board members!



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Upcoming events

IPIC 2021

Towards a smart hyperconnected era of efficient and sustainable logistics, supply chains and transportation

IPIC 2021 - 8th International Physical Internet Conference

June 14-16, 2021 | Virtual | 35 Sessions

PLANET: Progress Towards Federated Logistics through the Integration of
TEN-T into a Global Trade Network

SAVE THE DATE

JUNE 16 2021 – DAY 2 IPIC2021, SESSION 25

From 11:00 to 12:30

COORDINATOR OF THE PLANET PROJECT

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