

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

Project Abstract

PLANET addresses 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 focusing in two key R&D pillars:

- A Geo-economics approach, modelling and specifying the dynamics of new trade routes and its impacts on logistics infrastructure & operations, with specific reference to TEN-T, including peripheral regions and landlocked developing countries;
- An EU-Global network enablement through disruptive concepts and technologies (IoT, Blockchain and PI, 5G, 3D printing, autonomous vehicles / automation, hyperloop) which can shape its future and address its shortcomings, aligned to the DTLF concept of a federated network of T&L platforms.

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 project employs 3 EU-global real-world corridor Living Labs including sea and rail for intercontinental connection and provides the experimentation environment for designing and exploiting future PI-oriented Integrated Green EU-Global T&L Networks [EGTN]. To facilitate this process, PLANET delivers a Symbiotic Digital Clone for EGTNs, as an open collaborative planning tool for TEN-T Corridor participants, infrastructure planners, and industry/ technology strategists. PLANET also delivers an Active Blueprint and Road Map, providing guidance and building public & private actor capacity towards the realisation of EGTNs, and facilitating the development of disadvantaged regions. The project engages major T&L stakeholders, contributing to both strategy and technology and (importantly) has the industry weight and influence to create industry momentum in Federated Logistics and TEN-T's integration into the Global Network.

Living Lab Descriptions

Living Lab 1: PI and Blockchain for optimised door-to-door Asia-Europe corridors - Mediterranean Corridor

LL1 will evaluate how new technologies (IoT, AI and blockchain) and concepts (Physical Internet) can improve processes, operations and efficiency along the door-to-door transport chains linking the Maritime Silk Road with EU internal corridors. LL1 will be divided in to two main use cases:

The first use case will focus on import/export door-to-door transport chain of containerized cargo between China and Spain. LL1 will evaluate how the combination of IoT (for real-time monitoring of logistics assets), AI (for better forecasts and intelligent decisions based on machine learning algorithms) and blockchain (for paperless transactions and the register of transport events), can contribute to a better management of the transport chain. The development of the PI paradigm will be investigated, where intelligent logistic nodes or hubs play a key role in transport decisions and are optimized based on real time events/information and historical data.

The second use case will focus on warehouse operations and will explore how new IoT, AI, AR and automation technologies can contribute to the development of intelligent automated logistics nodes of the EGTM/PI network. This use case will complement Use Case 1, particularly on how to integrate smart Warehouse Nodes for EGTM routing decisions, ultimately creating PI Warehousing Nodes.

Living Lab 2: Synchronodal dynamic management of TEN-T & intercontinental flows promoting rail transport

LL2 will focus on dynamic and Synchronodal management of TEN-T & intercontinental flows promoting rail transport and utilising the Port of Rotterdam (PoR) as the principal smart EGTM Node coordinating the rail focused transport chains linking China through Rotterdam to/from USA, and the Rhine-Alpine Corridor destinations. LL2 will include 3 main use cases:

1. The first use case will focus on Synchronodality in a Blockchain enabled Platform utilising advanced IoT, supporting PoR customers & communities to create the best multi-modal alternatives for logistics solutions within the LL2 corridors.
2. The second use case will focus on investigating Eurasian rail freight expansion in the LL2 corridor by building on results from T1.2. HUPAC will provide data from services and report on key issues to be addressed for infrastructure development, as well as examine potential for expanding services in the corridor and implement (in a test environment) the use of Blockchain on rail freight transport between China and Europe.
3. The third use case will analyse LL2 corridor flows and assess the implication for PoR and TEN-T infrastructure, extending T1.2 results with data from EGTC and use cases 1 and 2. The use of the PLANET tools by PoR and “Interregional Alliance for the Rhine-Alpine Corridor EGTC” is directed at strategic corridor planning and in use by EGTC members in the context of use case1.

Living Lab 3: IoT for Silk Road Route – reliable, transparent and fully connected corridor from China to the EU

LL3 will focus on streamlining logistic processes in flows from China to Europe along the Silk Road 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. LL3 aims at:

1. Standardising information flows and digitalising interactions between actors within the network (Alibaba, China Post, Polish National Post); Providing access to real time information on cargo coming from China to Poland along the entire supply chain through application of IoT and EPCIS to monitor supply chain events and support operational optimisation;
2. Facilitating effective co-modal end-to end transport within EU’s internal rail network.

Project Activities

Work-Package 1: EU Global Transport and Logistics Networks (EGTN)

This WP will provide a Simulation Capability for the assessment of the expected impact of emerging trade routes, national strategies and technological concepts on the TEN-T corridors and PENs interfacing TEN-T to global trade and will define the Reference Specifications of Integrated Green EU-Global networks [EGTN].

Work Package 2: PLANET Cloud Based Open EGTN Infrastructure

WP2 will define the architecture and prototype the components of an open ICT infrastructure compliant with the requirements specification, to support the development of EGTN solutions in the LLs (WP3) that open up more opportunities for global connectivity, international trade, and economic development. The work package will create a core set of open ICT technologies (specifications and prototypes) that can be taken up by T&L stakeholders, including private and public (such as customs) organizations.

Work-Package 3: PLANET Living Labs

WP3 is designed to provide both an experimentation/innovation environment and testbed for EGTN solutions along three global corridors. Each LL EGTN solution has different context and complementary business and technology focus with strong inter -LL knowledge exchange. Outputs from the three LLs will be linked into a generic use case defining the introduction of the EGTN new logistics concepts & technologies that were tested in the LLs and will support design and evaluation of EGTN solutions by TEN-T and T&L communities.

Work-Package 4: Steering Innovation and Building Capacity towards EGTN

WP4 will provide a guidance and capacity building towards an integrated Green EU-Global Trade Logistics Network aligning with global T&L blockchain initiatives and ALICE PI roadmap.

Work-Package 5: Dissemination, Commercialisation and Policy Recommendations

WP5 ensures sustainability of project outputs from WP1-4. WP5 will lead all the activities related to dissemination, communication and outreach as well the exploitation of the project results. The interaction with the other WPs will be fundamental. The main activities related to this objective are:

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

Work-Package 6: Project Management

Implement Management Processes to ensure the completion of all deliverables in time, within budget and to the required quality standard. Perform administrative management, technical management, innovation management and quality management, which will be carried out to the full satisfaction of the EC, the Council of Partners and the Project Steering Team.