

How can port of the future have a positive environmental and social footprint?

After 36 months the sailing journey of the EU project COREALIS ends with remarkable research achievements in the field of the port of the future

The [COREALIS project](#), funded by EU H2020 programme, worked on the topic of the Port of the Future from May 2018 till the project end in April 2021. During this time, COREALIS team worked towards the vision of the Port of the Future by proposing a strategic, innovative framework, supported by disruptive technologies, including Internet of Things (IoT), data analytics, next generation traffic management and emerging 5G networks, for cargo ports to handle upcoming and future capacity, traffic, efficiency and environmental challenges.

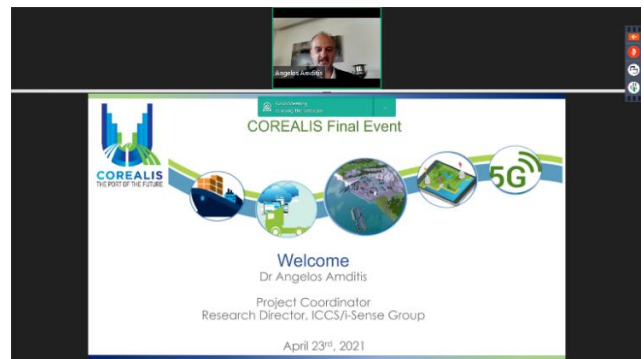
With a total budget of 5.1 million Euros funding by the European Commission, 17 partners from 10 European and associated Countries worked together and joined their expertise to contribute to the vision of a more environmentally friendly, socially sustainable and financially viable port of the future. The proposed beyond state-of-the-art innovations, targeted to increase efficiency and optimise land use, while being financially viable, respecting circular economy principles and being of service to the urban environment. These innovations were implemented and tested in real operating conditions in 5 Living Labs – top European ports, the Piraeus port, the Valencia port, the Antwerp port, the Livorno port and the Haminakotka port.

At the end of April 2021, COREALIS sailing journey ended with remarkable research achievements that were widely disseminated to the scientific and industrial community during a really fruitful final conference.

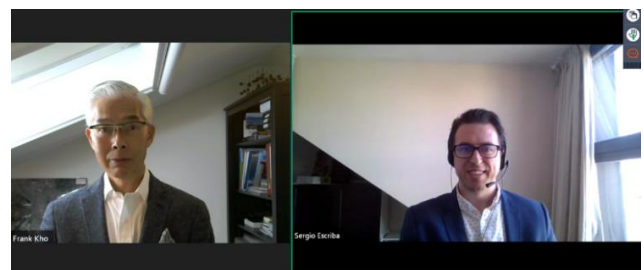
About COREALIS Final Conference

COREALIS Final Conference was held virtually on the 23rd of April 2021 so as to secure all participants' safety and health. The conference was very well attended, reaching up to 150 participants.

Dr. Angelos Amditis, COREALIS project coordinator, warmly welcomed all participants and landmarked the beginning of the meeting. COREALIS had also the pleasure to welcome on board its project officer at [CINEA](#), Mr. Sergio Escriba, who highlighted that COREALIS project precisely addressed the pillars of climate, energy and transport challenges in the port environment, and he gave special attention to the crucial momentum for the stakeholders' feedback for the Port of the Future. The opening session was concluded with the presentation of Mr. Frank Kho, Chief Executive Officer at Terminal Industry Committee 4.0, explaining how the cargo handling industry can get the full potential and embrace the 4th industrial evolution.



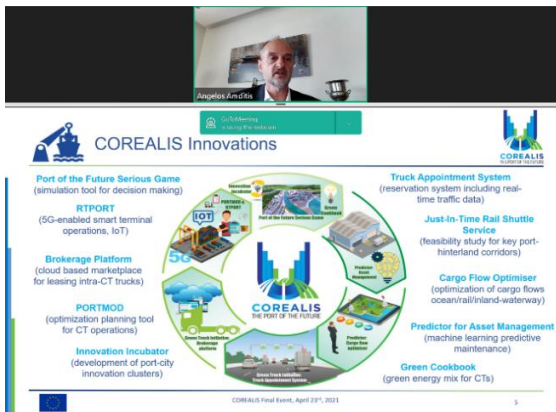
COREALIS Opening Session. Dr. Angelos Amditis



Left: Mr. Frank Kho & Right: Mr. Sergio Escriba



The next two sessions were devoted to the presentation and discussion of the COREALIS palette of port-driven technological and societal innovations represented by COREALIS technical partners namely SGS, VTT, MARLO, ERICSSON, NEC, MOSAIC, DELTARES, VPF and DYNNIQ.

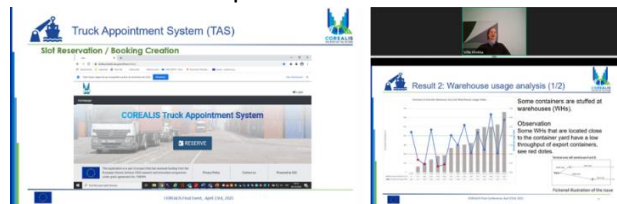


COREALIS at a Glance

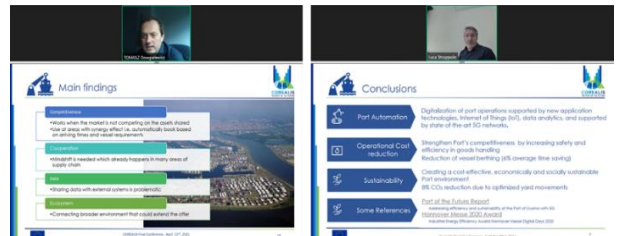
COREALIS palette of innovations is consisting of:

- **The COREALIS Green Truck Initiative**, that implements:
 - A dynamic **Truck Appointment System** aiming to coordinate and optimise the arrival of trucks according to the city traffic, terminal and other operations in the port area, so that queues, waiting times and congestion are minimised
 - The Marketplace and chassis brokerage platform** allowing online booking of port equipment and services.
- **The COREALIS PORTMOD**, aiming to increase operational efficiency, safety for personnel, emission analysis and improved data sharing by modelling and optimizing cargo and data flows within a port.
- **The COREALIS RTPORT**, that implements a system for real time control of port operations over a 5G network.
- **The COREALIS Predictor**, for a dynamic and optimized port asset management.
- **The COREALIS Cargo Flow Optimizer**, aiming to facilitate the port managers and urban planners in their infrastructure investment planning by optimizing cargo flows across all transport modes.
- **The COREALIS Port of the Future Serious Game**, aiming to assess the feasibility and sustainability of the socio-economic and environmental development of a port within the surrounding coastal and urban area.
- **The COREALIS Green Cookbook**, aiming to help ports to lower their environmental footprint, assess their energy profiles and move to cleaner transport modes and cleaner energy sources.
- **The COREALIS Innovation Incubator Scheme**, aiming to make the port the epicenter of the local. Industrial

landscape and support the growth of local entrepreneur SMEs and start-ups.



COREALIS TAS (SGS) & PORTMOD (VTT) innovations



COREALIS Brokerage platform (MARLO) & RTPORT (ERICSSON) innovations



COREALIS Cargo Flow Optimiser (MOSAIC) & PoF Serious Game (DELTARES) innovations



COREALIS JIT Rail Service (VPF) & Energy Assessment (DYNNIQ) innovations



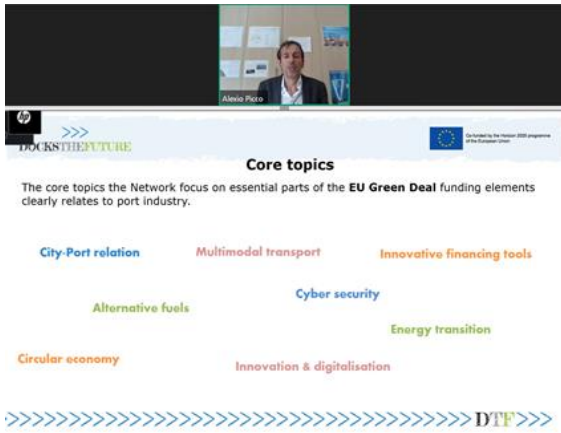
COREALIS Innovation Incubator (VPF) & Predictor Asset Management (NEC) innovations

The next session was focused on the Port of the Future Network, where representatives from the EU sister projects [DocksTheFuture](#), [Pixel](#) and [PortForward](#) shared their projects' vision towards ports of the future. Mr. Alexio Picco (CIRCLE), Docks The Future coordinator presented the main project outcomes and achieved goals. Mr. Carlos Palau (UPV), coordinator of Pixel project,



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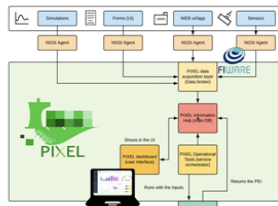
explained how Pixel aligns with COREALIS's concept of the future port. Finally, the PortForward coordinator, Mr. Christian Blobner (Fraunhofer) presented the use cases and technologies developed and tested in the project towards a holistic approach to a smarter, greener and more sustainable port of the future ecosystem.



Mr. Alexio Picco (CIRCLE), DockstheFuture Coordinator

Technological proposal

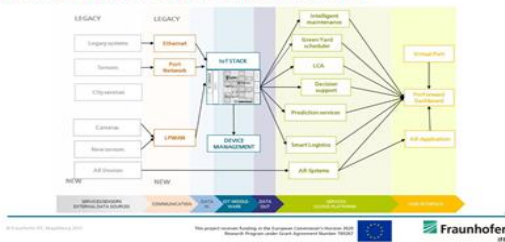
- Data Acquisition Layer (DAL), which is in charge of gathering data and sending it to a FIWARE Orion context broker. In this context, several agents based on the pyngi framework have been developed acting as data gateways.
- Information Hub (IH): a custom (PIXEL) component based on an ELK implementation, the central data storage component.
- Operational Tools (OT), a custom Java-based component that orchestrates the proper execution of all other modules (containing using Docker).
- The dashboard is a web application (developed in Vue.js) for configuring and observing the results of composite indicators, models, predictive algorithms and sensor data monitoring.



Mr. Carlos Palau (UPV), Coordinator of Pixel project



But what is PortForward
A picture for a thousand words – technical architecture



Mr. Christian Blobner (Fraunhofer), PortForward coordinator

Special part of the day was the interactive and constructive high-level discussion with prominent invited guests from several EU organisations (CNIT, European Inland Waterway Transport Platform-IWT, Piraeus Container Terminal-PCT) and ports (Port of Antwerp, Port of Barcelona, Port of Rotterdam), who elaborated on their 'vision and challenges towards the port of 2030 and beyond', by giving lightning talks.



COREALIS high-level discussion: Left: Mr. Carles Rúa, Chief Innovation Officer, Port of Barcelona & Right: Mr. Paolo Pagano Director of Joint Laboratory CNIT/AdSPTS



COREALIS high-level discussion: Left: Mr. Nik Delmeire Coordinator, European Inland Waterway Transport Platform – IWT & Right: Mr. Fernando Liesa Secretary General, European Technology Platform ALICE



COREALIS high-level discussion: Left: Mr. Zhang Anming, CEO of Piraeus Port Authority, Managing Director of Piraeus Container Terminal & Right: Mr. Piet Opstaele, Innovation enablement manager, Port of Antwerp



COREALIS high-level discussion: Mr. Pieter de Waard, Corporate Strategist, Port of Rotterdam

The project coordinator concluded the day by summarizing COREALIS achievements and by highlighting that 'COREALIS has set a basis, but there is still a long way towards achieving operational efficiency and climate neutrality as set by the European Green Deal'. More information about the COREALIS Final Conference can be found [here](#).



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