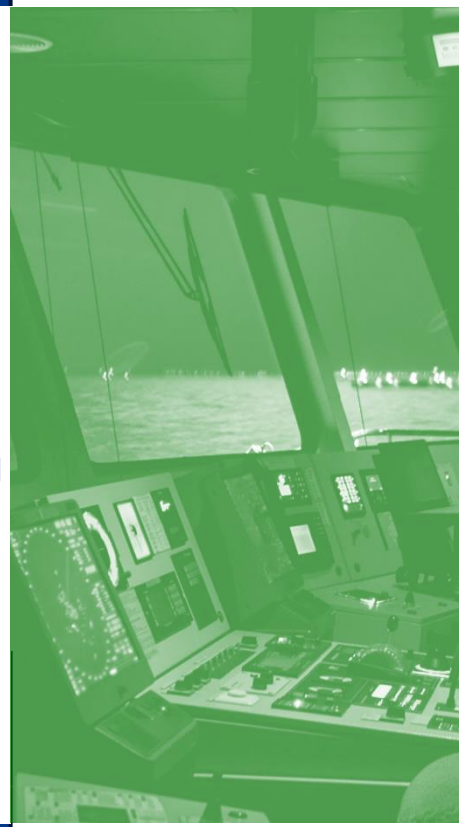
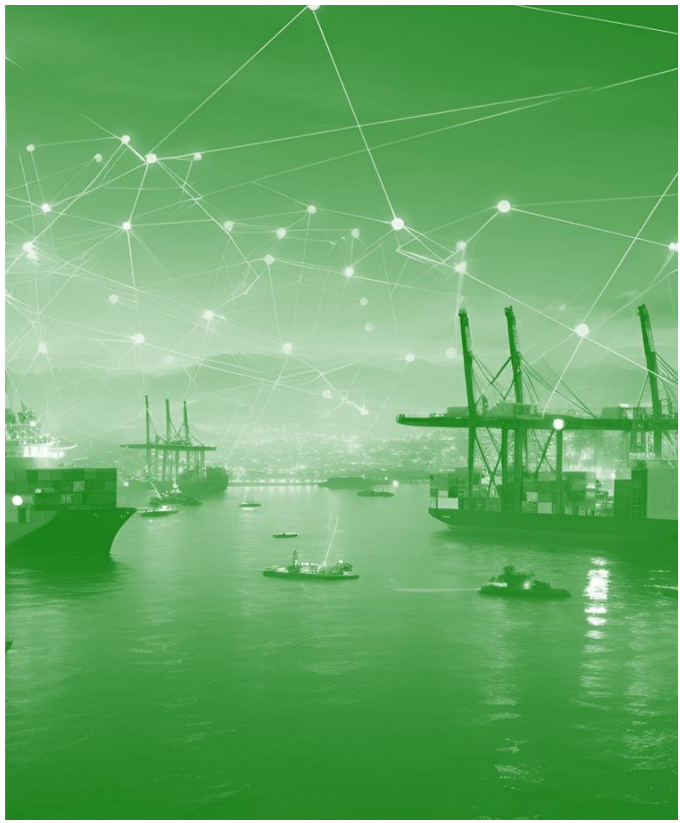
DYNAPORT

DYNAMIC NAVIGATION AND PORT CALL OPTIMISATION IN REAL TIME

Agathe Rialland, SINTEF Ocean
MTEC ICMASS 2024
Trondheim, 29-10-2024

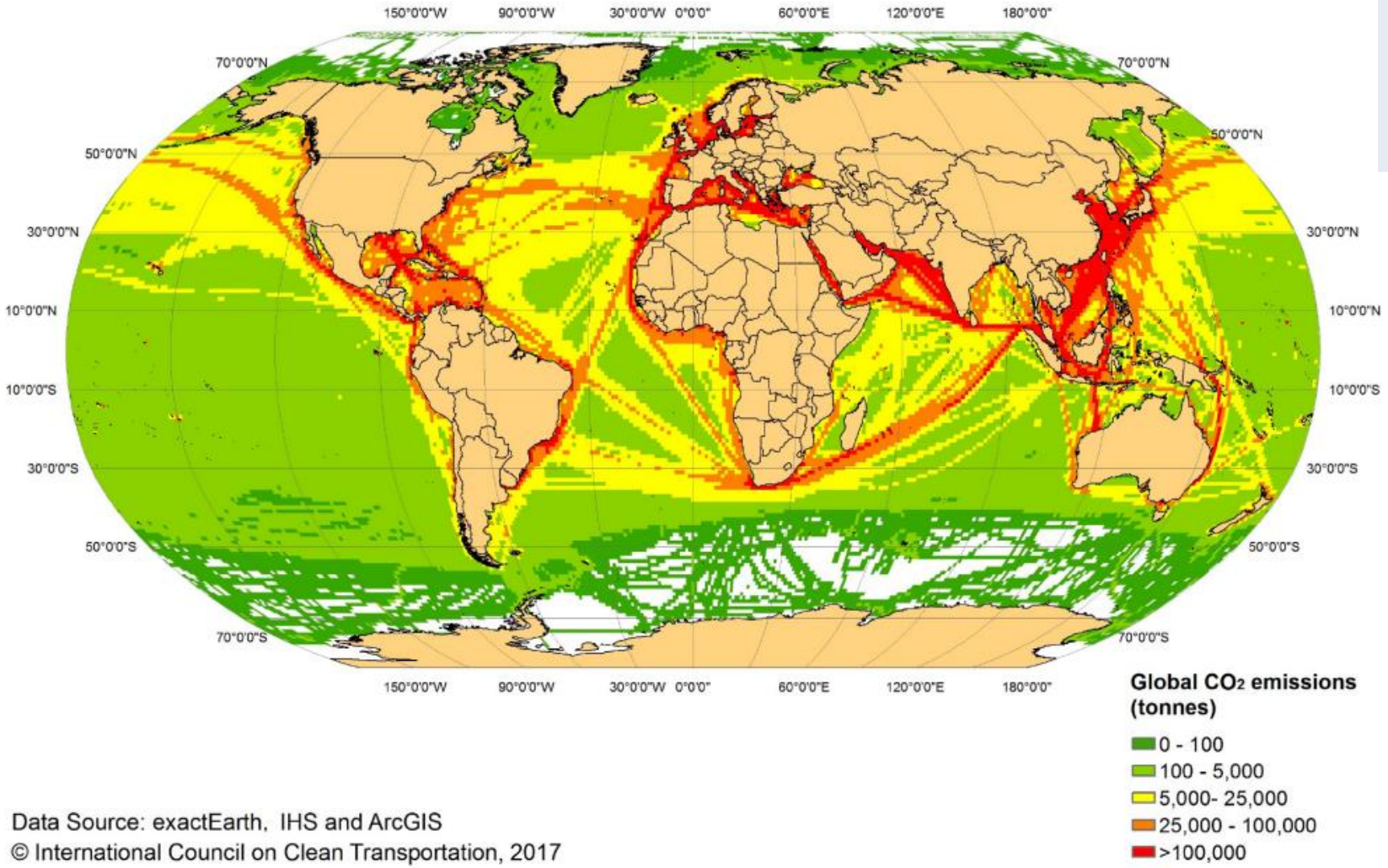




Funded by
the European Union


Why are ships still waiting?

Global shipping carbon footprint



Data Source: exactEarth, IHS and ArcGIS
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80% of global **trade**

3% of global **GHG**

96% fossil fueled

Main sources of shipping GHG

81% : cargo vessels

63% : Tank+Container+Bulk

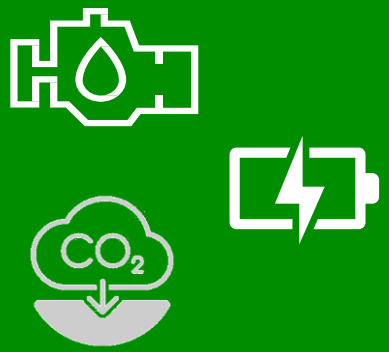
76% : engine size > 5 MW

70%: international trade

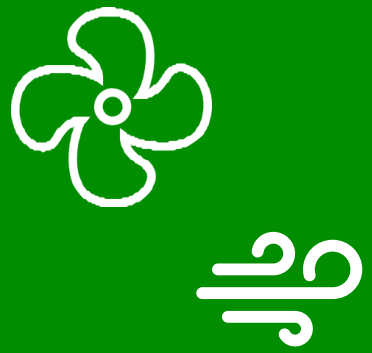
90% : at sea

10% : at/near port (tankers, 20%)

GREEN FUELS & CCS



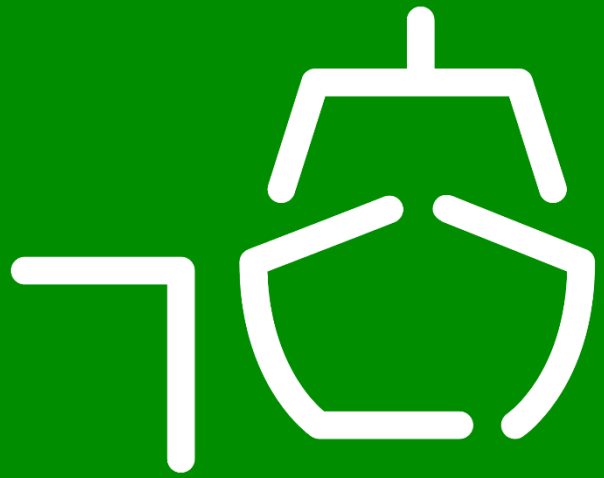
NOVEL PROPULSION & ENERGY SAVING



TECHNICAL IMPROVEMENT & MAINTENANCE

OPERATIONAL EFFICIENCY

FLEET UTILIZATION OPTIMIZATION



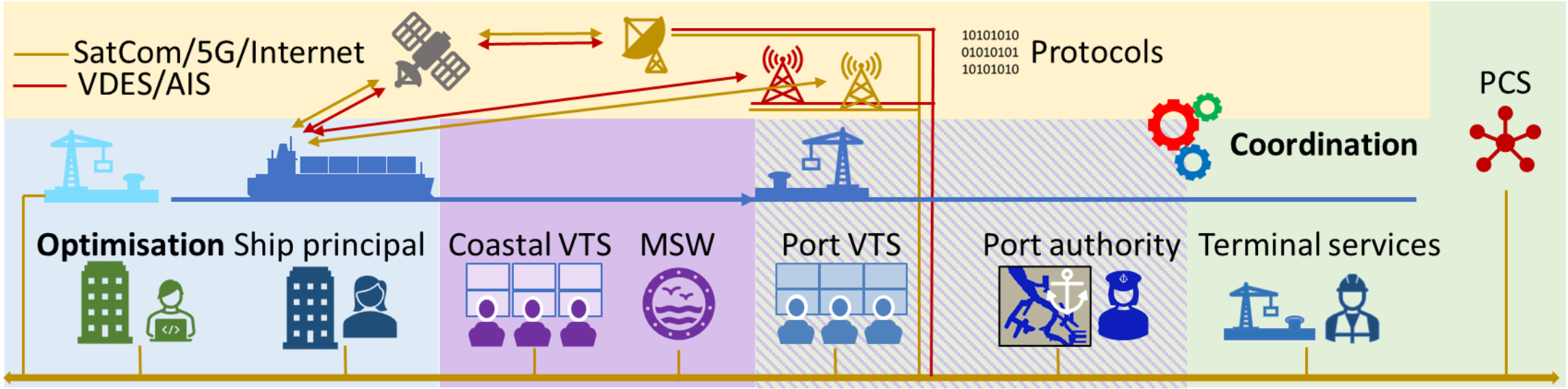
Just-in-time = enabler for shipping decarbonization

Funded by the European Union

The DYNAPORT project: DYNAMIC NAVIGATION AND PORT CALL OPTIMISATION IN REAL TIME

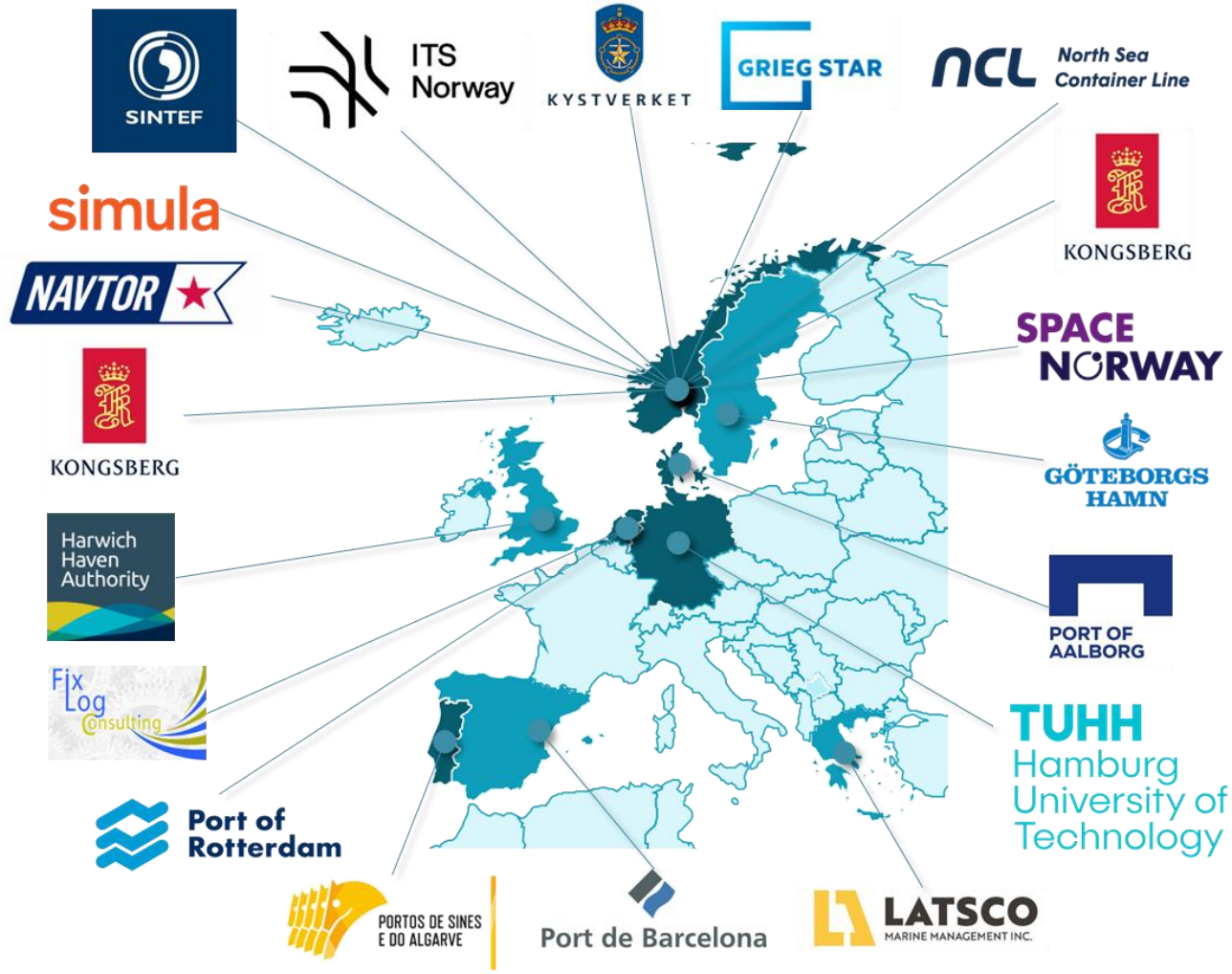
DYNAPORT
DYNAMIC NAVIGATION AND PORT CALL OPTIMISATION IN REAL TIME

Develop and demonstrate **optimisation and coordination tools for ports and ships to support voyage and port call optimization.**



Reduce ship fuel consumption and increase port efficiency with at least 10%

Project Consortium



R&D and University	**SINTEF** (maritime technology) **TUHH** (maritime logistics) **Simula** (AI-based simulation) **Aalborg Port R&D**	
Ports	**Sines** **Aalborg** **Harwich**	**Barcelona** **Rotterdam** **Gothenburg**
Shipping Companies	**NCL** (Container) **Grieg Star** (Breakbulk, Drybulk) **Latsco** Marine Management (Tanker)	
Equipment, Software & Services providers	**NAVTOR** (nagivation; voyage planning, port arrival) **Kongsberg Norcontrol** (vessel traffic services) **Kongsberg Discovery** (VDES equipment / systems) **Space Norway** (communication infrastructure)	
Standardization	**ITS Norway** (Maritime digital standardization) **FixLog** (Port digitalization) **Norwegian Coastal Administration**	

DYNAPORT approach

R&D and Demonstrators

VOYAGE OPTIMIZATION

End-to-end voyage optimisation

JIT ENABLING CONTRACTS

Shipping business models & contracts

JIT Coordination Port Call & Optimization

ETA

RTA

PTA

PORT OPERATIONS OPTIMIZATION

Port processes and business models

PORT/COASTAL VTS NAVIGATION SAFETY

Improved nautical safety

ICT STANDARDS AND SERVICES

Communication standards

Cyber-secure communication

Impact Assessment

- System integration and simulation
- KPIs definitions
- Impact assessment

Holistic performance assessment

Exploitation

- Business plans for upscaling
- Policy & Industry Recommendations

Business plans for upscaling

Get earliest possible PTA for next JIT port call and optimize voyage to that target while improving safety of navigation.

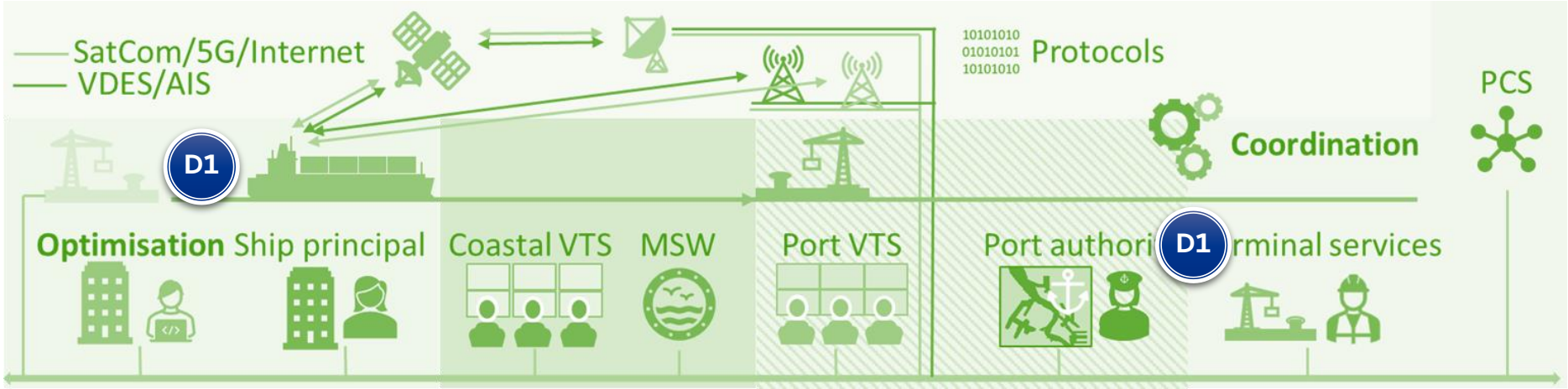
DEMO 1

PORT CALL PLANNING ON SHIP

DYNAPORT
DYNAMIC NAVIGATION AND PORT CALL OPTIMISATION IN REAL TIME

Demonstrate how digitalizing the port call planning process can improve safety of navigation.

Transmission of standard nautical and operational information from the relevant port parties



PARTNERS

NAVTOR

Port de Barcelona

Port of Rotterdam

GRIEG STAR

LATSCO
MARINE MANAGEMENT INC.

DEMO 2

SHIP-PORT COMMUNICATION FOR JIT ARRIVAL & DEPARTURE

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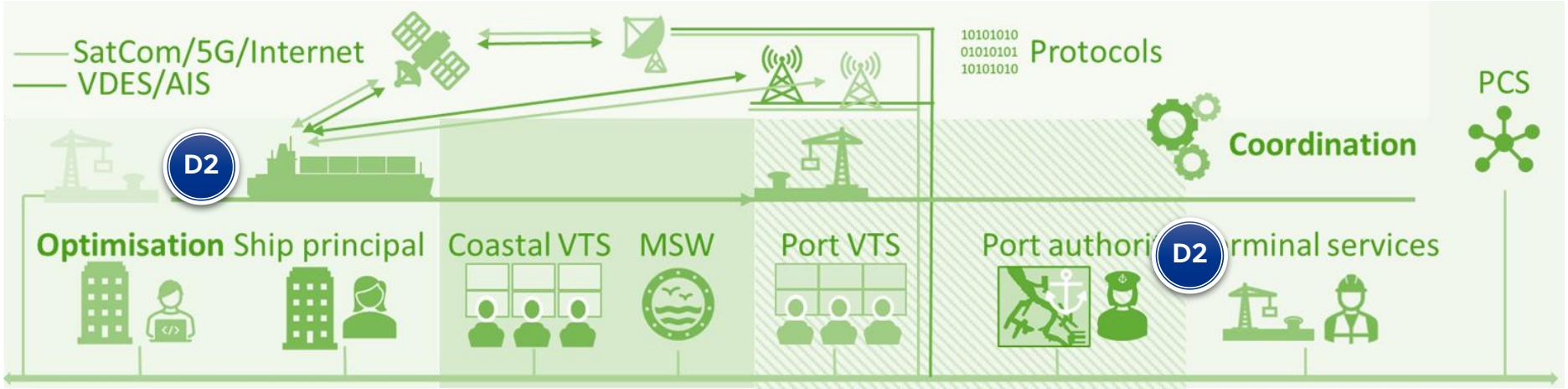
Demonstrate protocols and methods for communication between ship and port for just in time arrival and departure planning and optimization of port call.



PARTNERS

KONGSBERG

KYSTVERKET

TUHH
Hamburg
University of
Technology

Port of
Rotterdam

PORTOS DE SINES
E DO ALGARVE

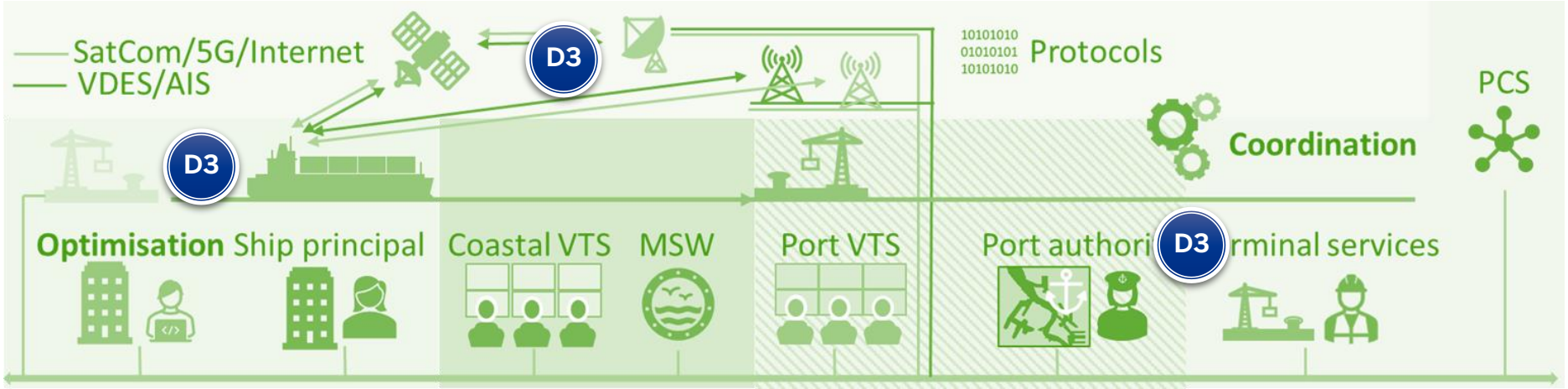
GÖTEBORGS
HAMN

DEMO 3 UPDATES TO JIT PLANNING

DYNAPORT
DYNAMIC NAVIGATION AND PORT CALL OPTIMISATION IN REAL TIME

Demonstrate the reliability of VDES for end-to-end communication on JIT-related information, both in open sea and port approach.


Illustration: Shutterstock1084966858



PARTNERS

KONGSBERG
Discovery

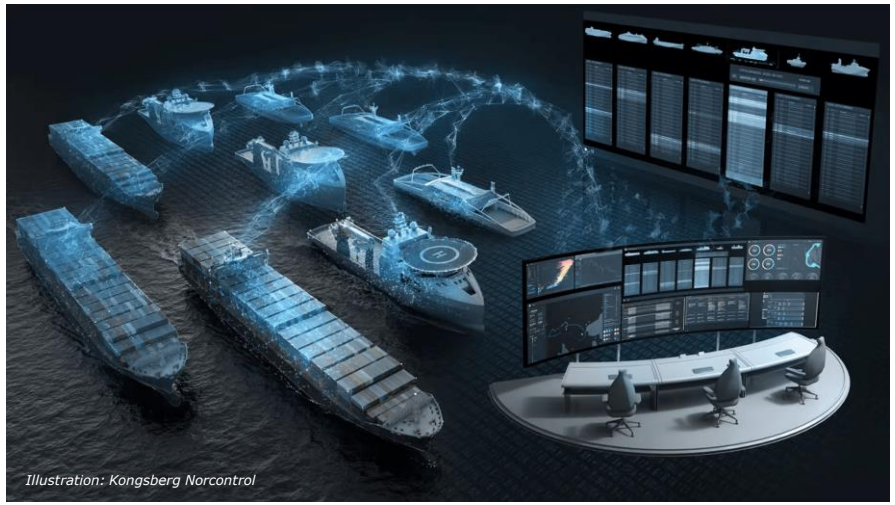
KONGSBERG
Norcontrol

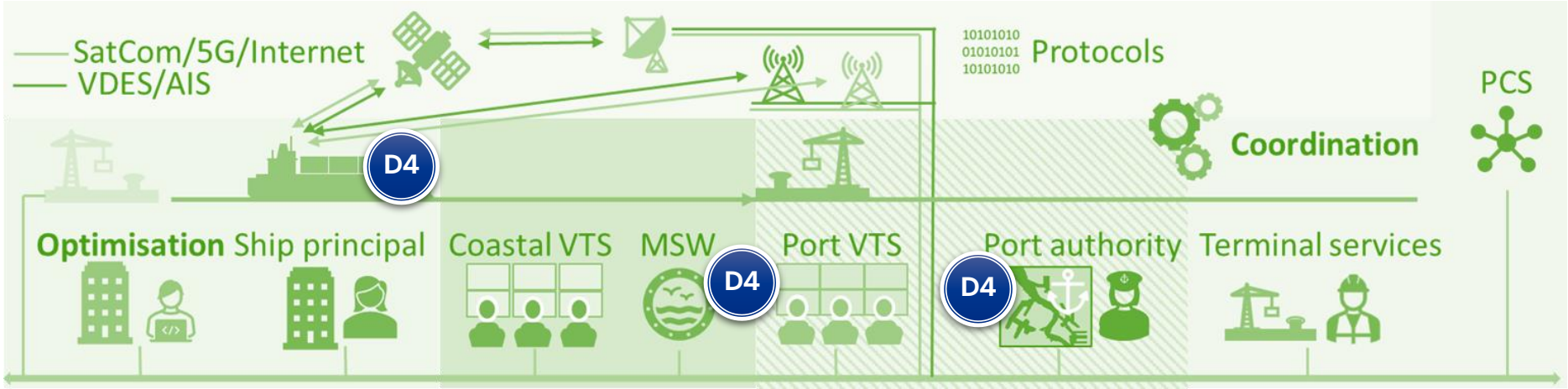
SPACE NORWAY

KYSTVERKET

DEMO 4 IMPROVED VTS OPERATIONS

Demonstrate updates to VTS functions with integration to MSW and AIS, and contribution to reducing in traffic density and risk of collision.





PARTNERS

KONGSBERG

KYSTVERKET

GÖTEBORGS HAMN

Port de Barcelona

Harwich Haven Authority

DEMO 5 END-TO-END VOYAGE OPTIMISATION

DYNAPORT
DYNAMIC NAVIGATION AND PORT CALL OPTIMISATION IN REAL TIME

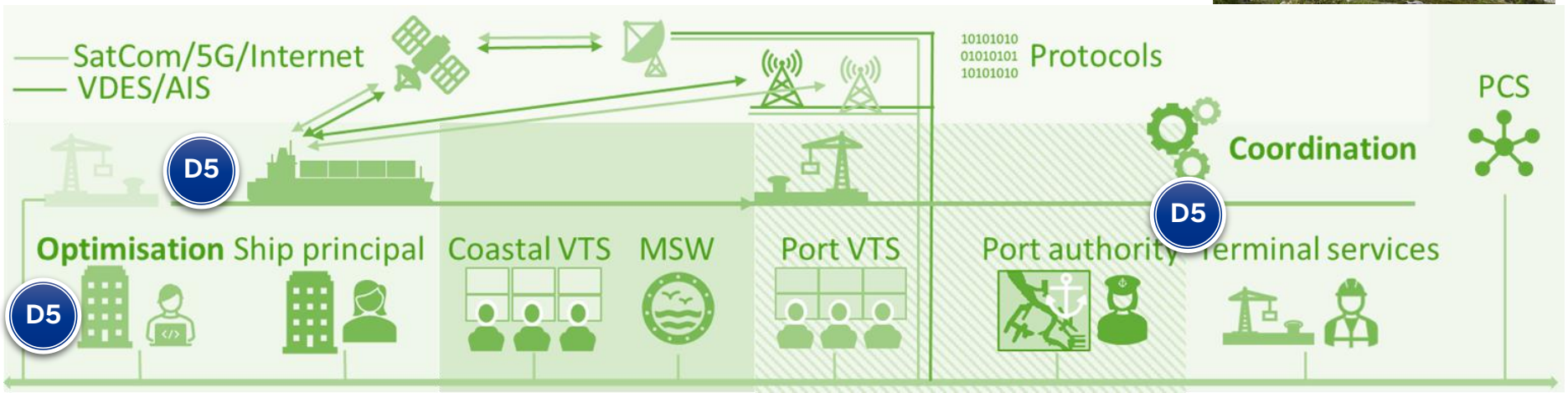
Demonstrate the use of the Voyage Optimization System onboard, in real-time interaction with ports.

Explore contribution to on reliable, safe, cost- and carbon efficient voyage.


Star Istind (phot: GS)


Hellas Hercules (phot: LMM)


NCL Ikornnes(phot: NCL)



PARTNERS

NAVTOR

SINTEF

GRIEG STAR

LATSCO MARINE MANAGEMENT INC.

ncl North Sea Container Line

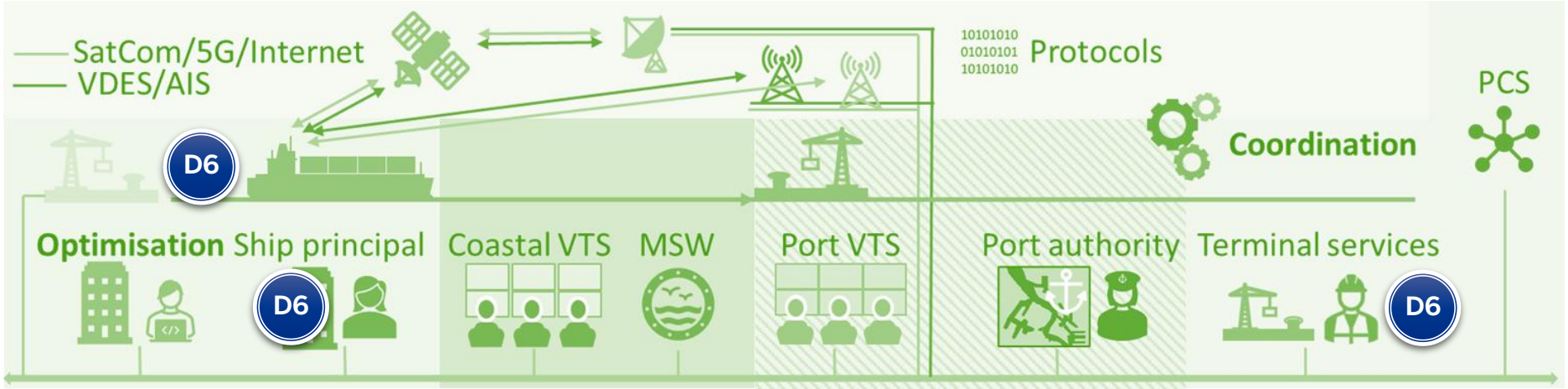
DEMO 6

UPDATES TO ARRIVAL TIME WITH MINIMAL IMPACTS ON CONTRACTS

DYNAPORT
DYNAMIC NAVIGATION AND PORT CALL OPTIMISATION IN REAL TIME

Demonstrate how to handle changes in arrival times due to factors both under and/or beyond the control of the master.

Showcase the application of cooperation mechanisms.



PARTNERS

PORT OF AALBORG

SINTEF

ITS Norway

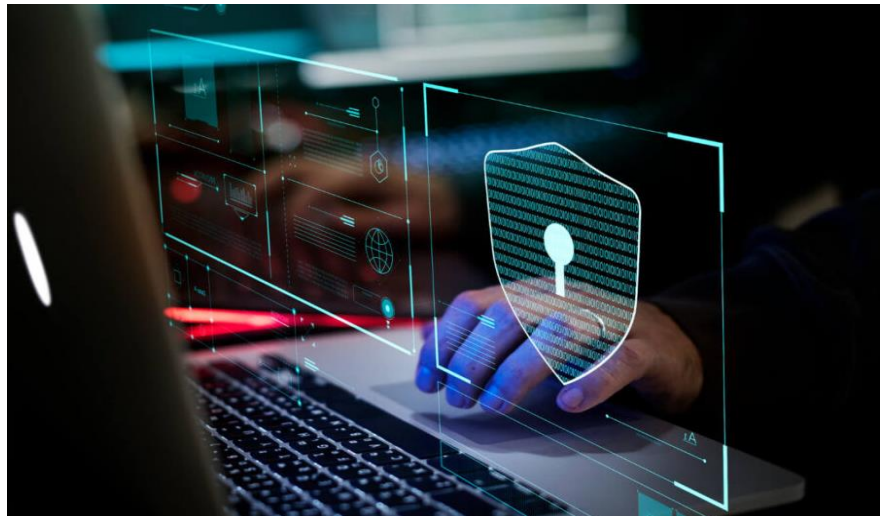
TUHH Hamburg University of Technology

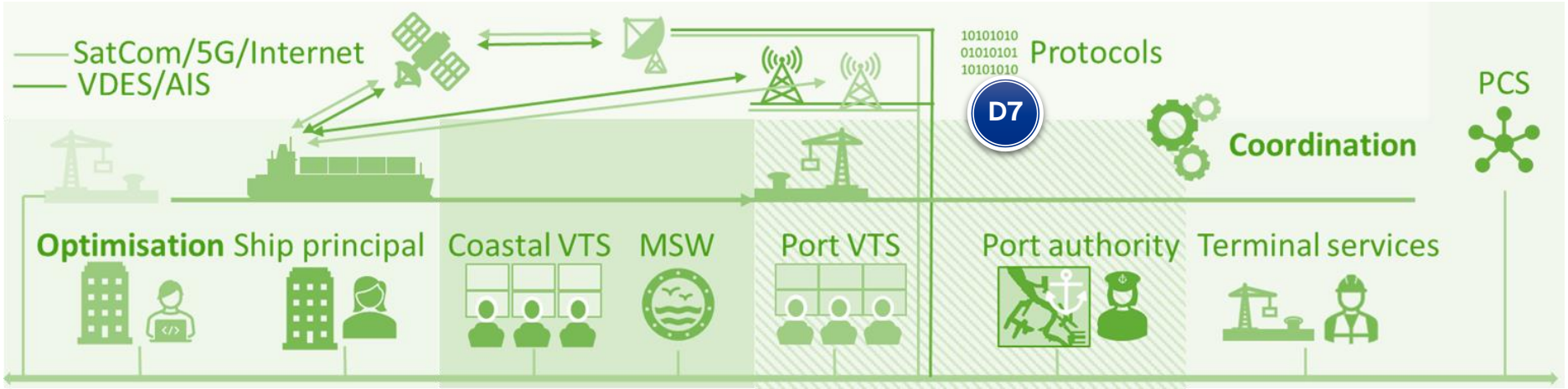
PORTOS DE SINES E DO ALGARVE

DEMO 7

USE OF COMMON PKI FOR DIGITAL SIGNATURES

Demonstrate the practical use of public key infrastructure for electronic signature certificates, securing reliable and efficient communication.





PARTNERS

ITS Norway

SINTEF

KONGSBERG

KYSTVERKET

SPACE NORWAY

Global collaboration network

EU –FUNDED SISTER PROJECT

MISSION

MaritIme juSt in time optimiSatION

PORT CALL OPTIMIZATION ALIGNMENT

International Taskforce Port Call Optimization

GLOBAL MARITIME FORUM

CHAINPORT

Global Industry Alliance LOW CARBON SHIPPING

MPA SINGAPORE

Port of Rotterdam

GDSC

MISSION

DYNAPORT

DYNAPORT ADVISORY GROUP

iaph

BIMCO

IALA

G2 OCEAN

IMO FACILITATION COMMITTEE (FAL)

EGDH

SDU

International Taskforce Port Call Optimization

DAKOSY

REGIONAL & INTERNATIONAL INDUSTRIAL INITIATIVES

Norske Havner

Maritime ITS

NAVTOR

GASS: Green Ai for Sustainable Shipping

SEAMLESS

DT4GS

The Research Council of Norway

Funded by
the European Union

dynaport.eu

DYNAPORT

DYNAMIC NAVIGATION AND PORT CALL OPTIMISATION IN REAL TIME

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THANK YOU
FOR YOUR ATTENTION

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Duration: 2024-2026
Coordinator: SINTEF Ocean
dynaport@sintef.no