



THE
SCIPPER
PROJECT

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Shipping Contributions to Inland Pollution Push for the Enforcement of Regulations

Name

Affiliation



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement Nr.814893



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Presentation Structure

- Project General Info
- Project Overview
- Methodology
- Measurement Campaigns
- Links with other projects





Call: 2018-2020 on Mobility for Growth

Section: I - Building a low-carbon, climate resilient future: Low-carbon and sustainable transport

Topic: LC-MG-I-I-2018: InCo flagship on reduction of transport impact on air quality

Duration: 36 months (Start date: May 1, 2019)

Budget: M€5,0

Coordinator: Aristotle University of Thessaloniki

Total Beneficiaries: 17 + 1 International partner

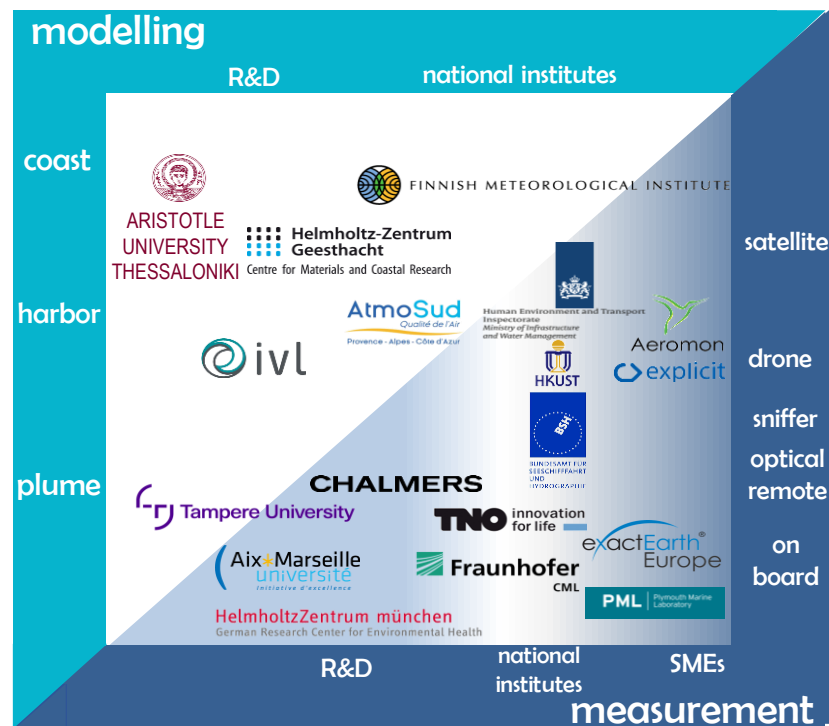




Partners

AUTH (GR)	HZG (DE)
TAU (FI)	IVL (SE)
CHALMERS (SE)	TNO (NL)
FMI (FI)	HMGU (DE)
PML (UK)	eEE (UK)
CML (DE)	BSH (DE)
ATMOSUD (FR)	AMU(FR)
EXPLICIT (DK)	AEROMON (FI)
ILT (NL)	HKUST (CN)

Expertise





Emission Control Areas (ECAs) in EU waters

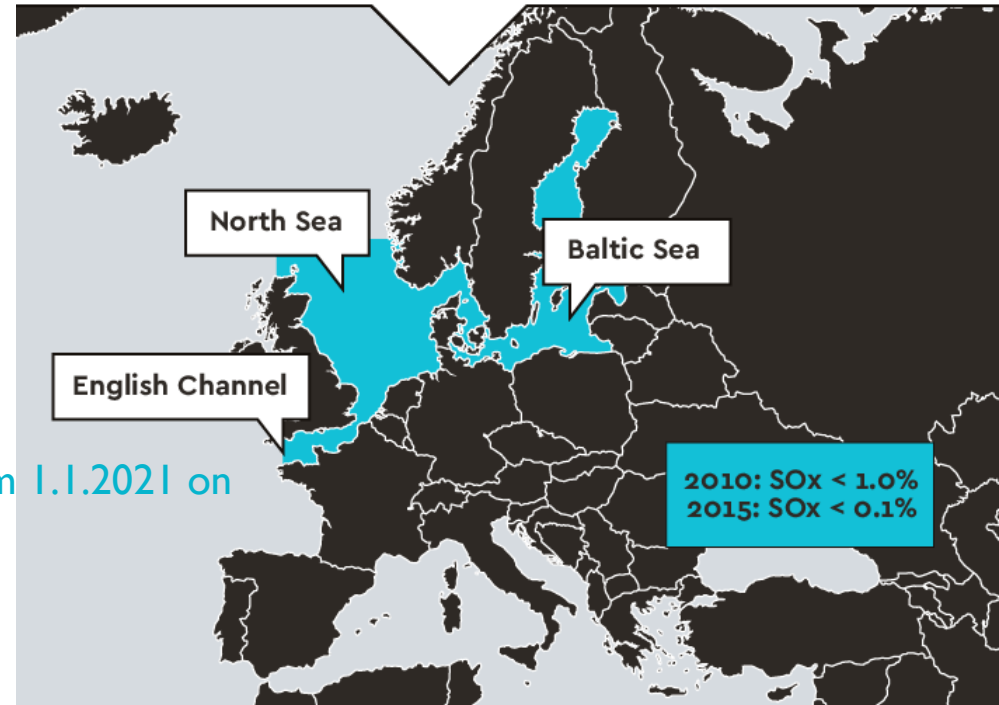
- Currently three regions:
 - Baltic Sea
 - North Sea
 - English Channel

Limits

- 0.1% max S since 1.1.2015
- Baltic and North Seas No_x Tier III ECAs from 1.1.2021 on

Developments

- On-going discussion for inclusion of the Mediterranean region as a SO_x - ECA





Some options to meet new emission standards:

- Low sulfur fuel and NO_x aftertreatment
- Heavy fuel and both NO_x and SO_x aftertreatment
- LNG
- Other fuels, like methanol, electrification, etc.

Main Question to be responded by SCIPPER:

How will authorities make sure that correct fuel or proper aftertreatment are being used?





Need for:

- **Compliance check** of environmental regulations.
- More evidence on **monitoring possibilities** for low sulphur levels, new pollutants, as well as **implications of non-compliant ships** to air pollution.

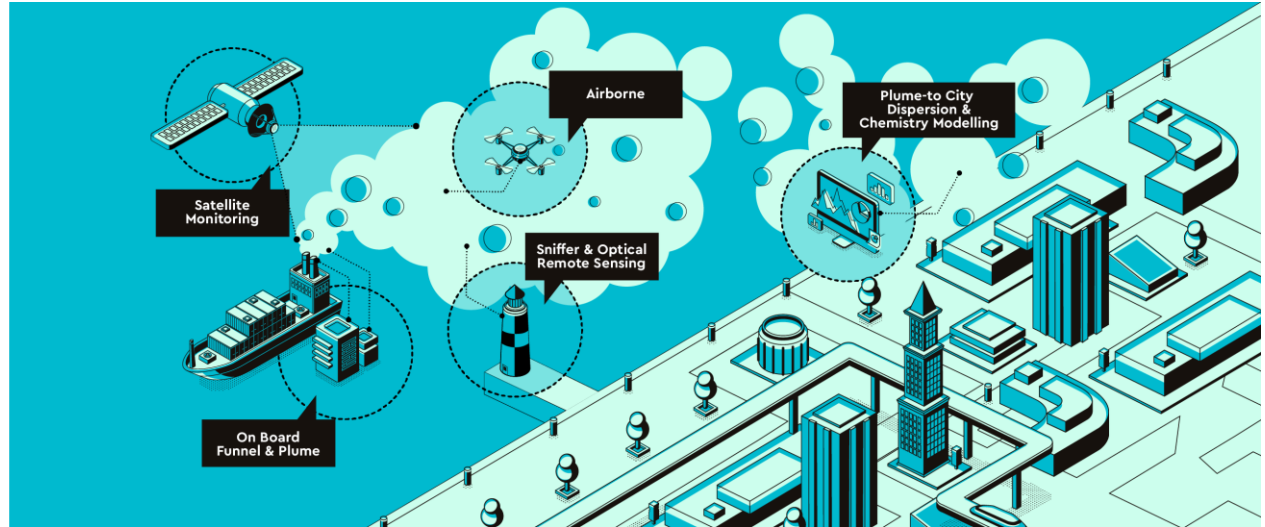
Main objectives:

- To provide evidence on the **performance and capacity of different techniques** for **shipping emissions monitoring** and,
- to **assess the impacts** of **shipping emissions on air quality**, under different regulatory enforcement scenarios.



Real-world deployment
of various monitoring
techniques

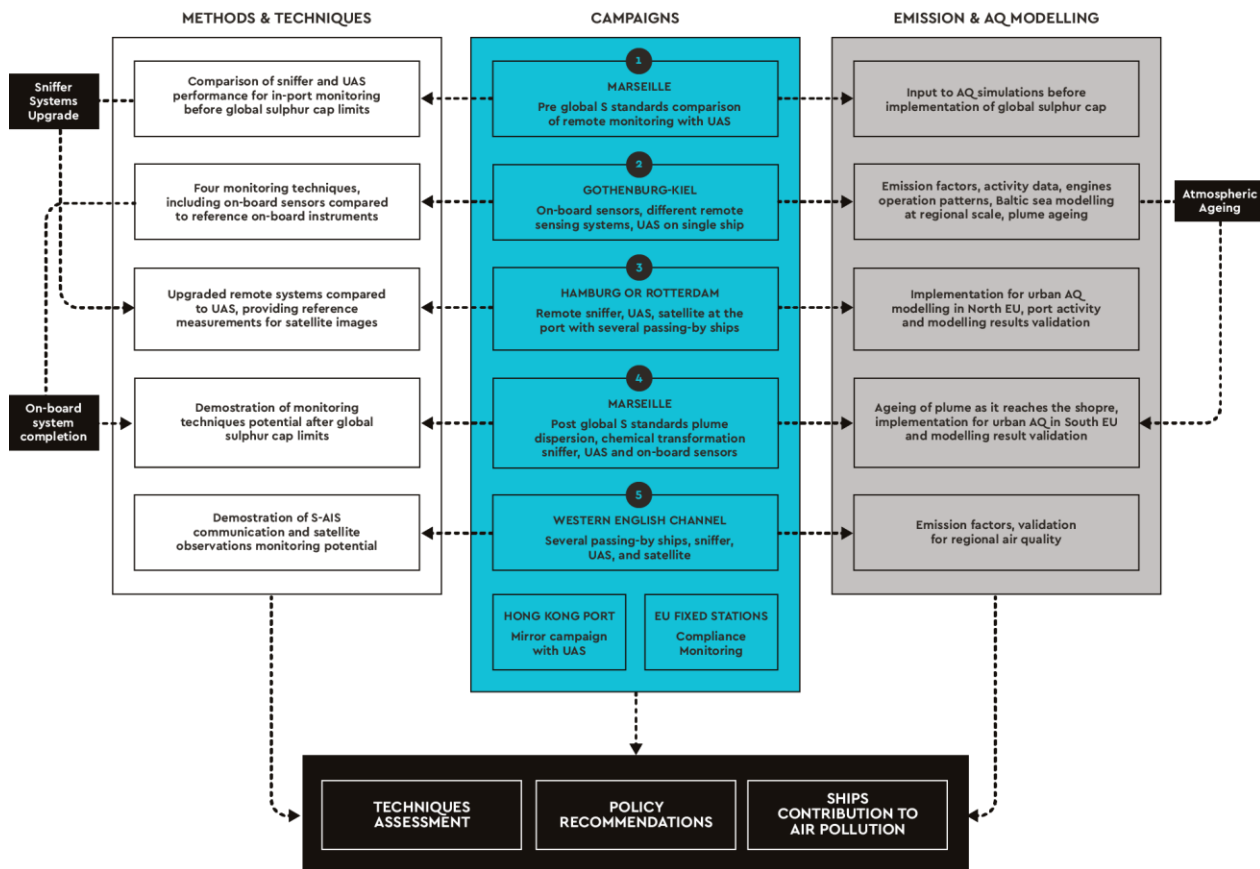
Implementation of 5
experimental campaigns
at different locations



- ❑ Application / validation / comparison of various emission measurement and monitoring techniques for emission standards compliance checking purposes
- ❑ Determination of the impact of shipping on air quality at coastal and harbor level



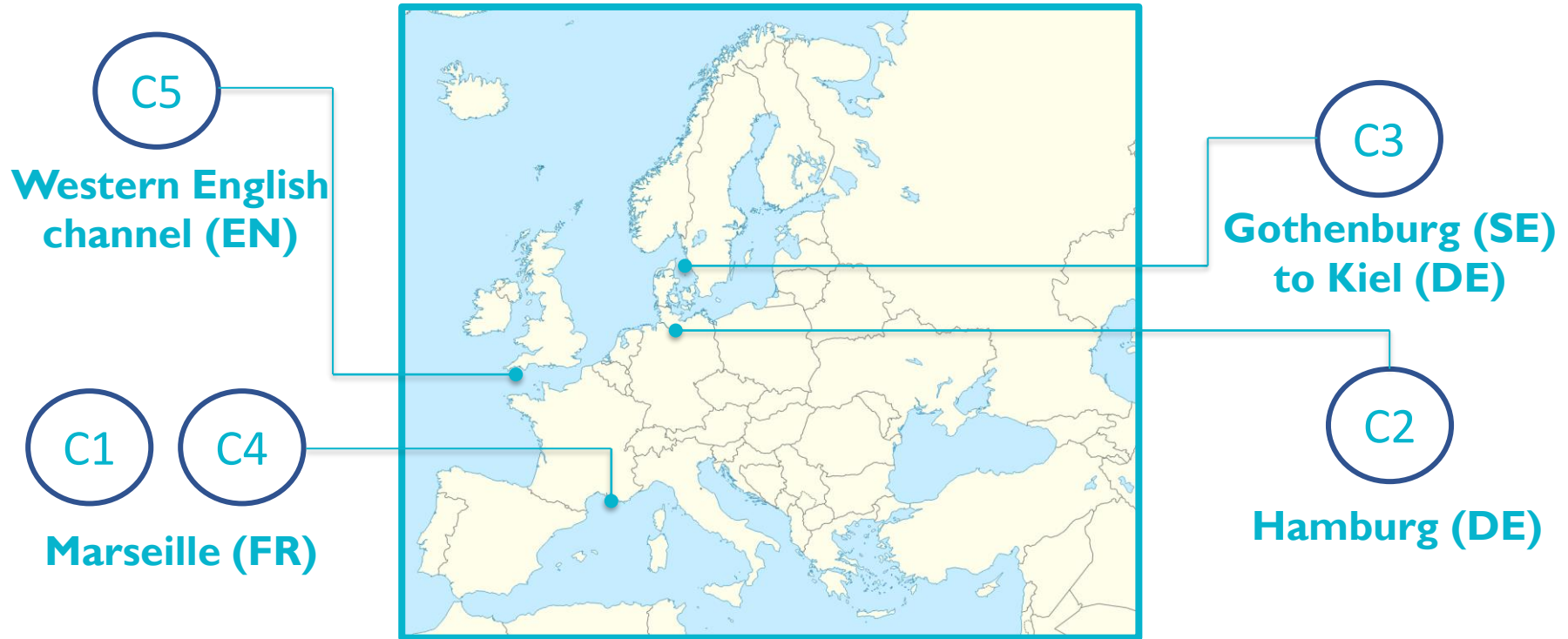
Methodology





- **New Technology:** New sensors, new techniques, improved methods
- **Science:** Emission factors, plume ageing, Air Quality modelling
- **Policy/Regulations:** Efficient enforcement, internationally pioneering, EU policy outreach







C1

Marseille (FR)

- **Techniques:** On-board sensors, remote sensing systems, UAS
- **Targets:** Remote compliance monitoring of FSC before regulation, state of art UAS application, input to AQ models
- **Vessels involved:** Harbor vessel to sample plume of berthing and moving ships in ports

C2

Gothenburg (SE) to Kiel (DE)

- **Techniques:** On-board sensors, remote sensing systems, UAS, on board characterizing of fresh and aged exhaust
- **Targets:** On board sensors and signal transmission, autonomous monitoring test, comparison with remote and UAS
- **Vessels involved:** Single ferry for on-board / remote comparison and, in addition, passing-by ships by remote techniques

C3

Hamburg (DE)

- **Techniques:** On-board sensors, remote sensing, UAS, coincidental satellite data on shipping routes, air quality modelling
- **Targets:** Beyond state-of-art remote measurement - uncertainty characterization for SO₂, NO_x and particulate components, implementation and validation location as input for AQ simulations, SO_x compliance
- **Vessels involved:** Regular shipping activity served by the port





Experimental Campaigns

C4

Marseille (FR)

- **Techniques:** Remote sensing techniques on-board (harbor vessel), at shore, and carried by UAVs, various instruments installed nearby aerosol supersite and in different port locations
- **Targets:** Remote compliance monitoring of FSC after regulation, in-depth characterization of plumes, application of remote techniques, A/Q impacts, installation of revised on board sensors
- **Vessels involved:** Harbor vessel to sample plume of berthing and moving ships in ports, Cruise ship with on board sensors

C5

Western English Channel (EN)

- **Techniques:** UAS, satellite focusing on the area, Satellite-AIS communication on RV
- **Targets:** Satellite observations potential for single or group of ships monitoring, comparison of UAS-based sensors vs remote sensing techniques, demonstration of emission signal transmission through satellite-AIS
- **Vessels involved:** Instrumented Plymouth Quest RV sampling emissions of passing-by shipping activity





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Thank You

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