

Welcome to TUHH Campus



Applied Research on Maritime Logistics - Fraunhofer CML in Hamburg



Prof. Dr.-Ing. Carlos Jahn, Hamburg, June 25th 2015



Agenda

- 1 Hamburg University of Technology (TUHH)
- 2 Fraunhofer
- 3 Fraunhofer CML in Hamburg
- 4 Discussion

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Hamburg University of Technology
www.tuhh.de

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Discussion

The Fraunhofer-Gesellschaft



The Fraunhofer-Gesellschaft undertakes applied research of direct utility to private and public enterprise and of wide benefit to society.

Our Customers:

- Industry
- Service sector
- Public administration

Fraunhofer at a glance

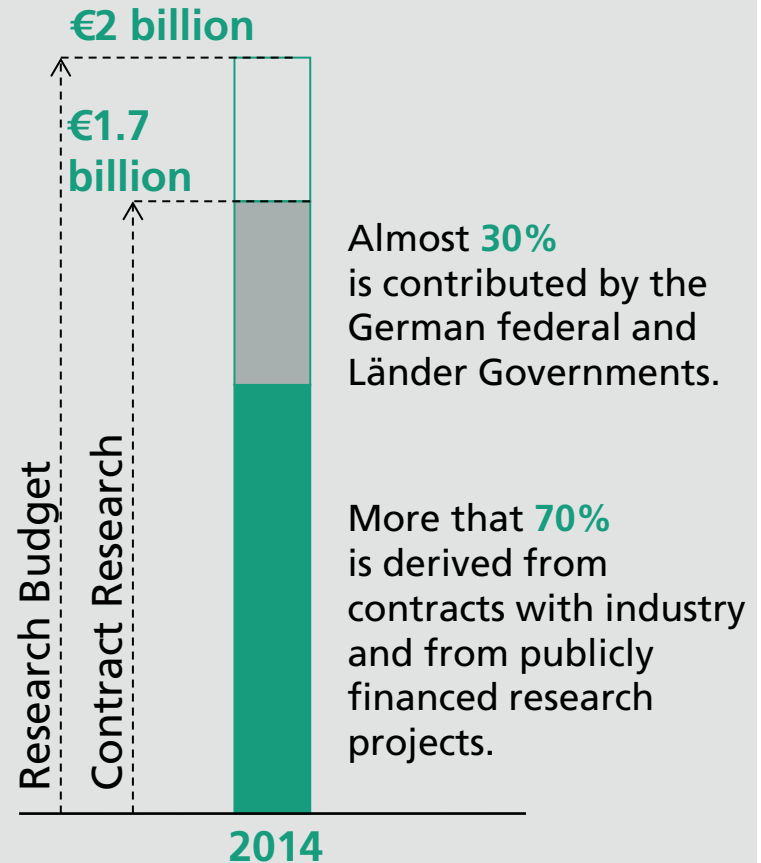
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Nearly **24,000** staff



66 institutes and research units



Joseph von Fraunhofer (1787 – 1826)



© Deutsches Museum

Researcher

- ➔ Discovery of the “Fraunhofer lines” in the solar spectrum

Inventor

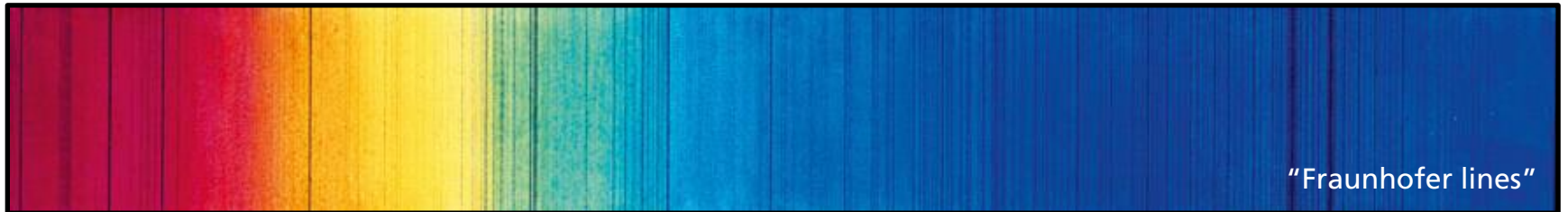
- ➔ New methods for processing lenses

Entrepreneur

- ➔ Director and partner in a glassworks



© Fraunhofer-Gesellschaft





**Joseph von
Fraunhofer**



**The Fraunhofer-
Gesellschaft**

Discovery of the
“Fraunhofer lines” in
the solar spectrum

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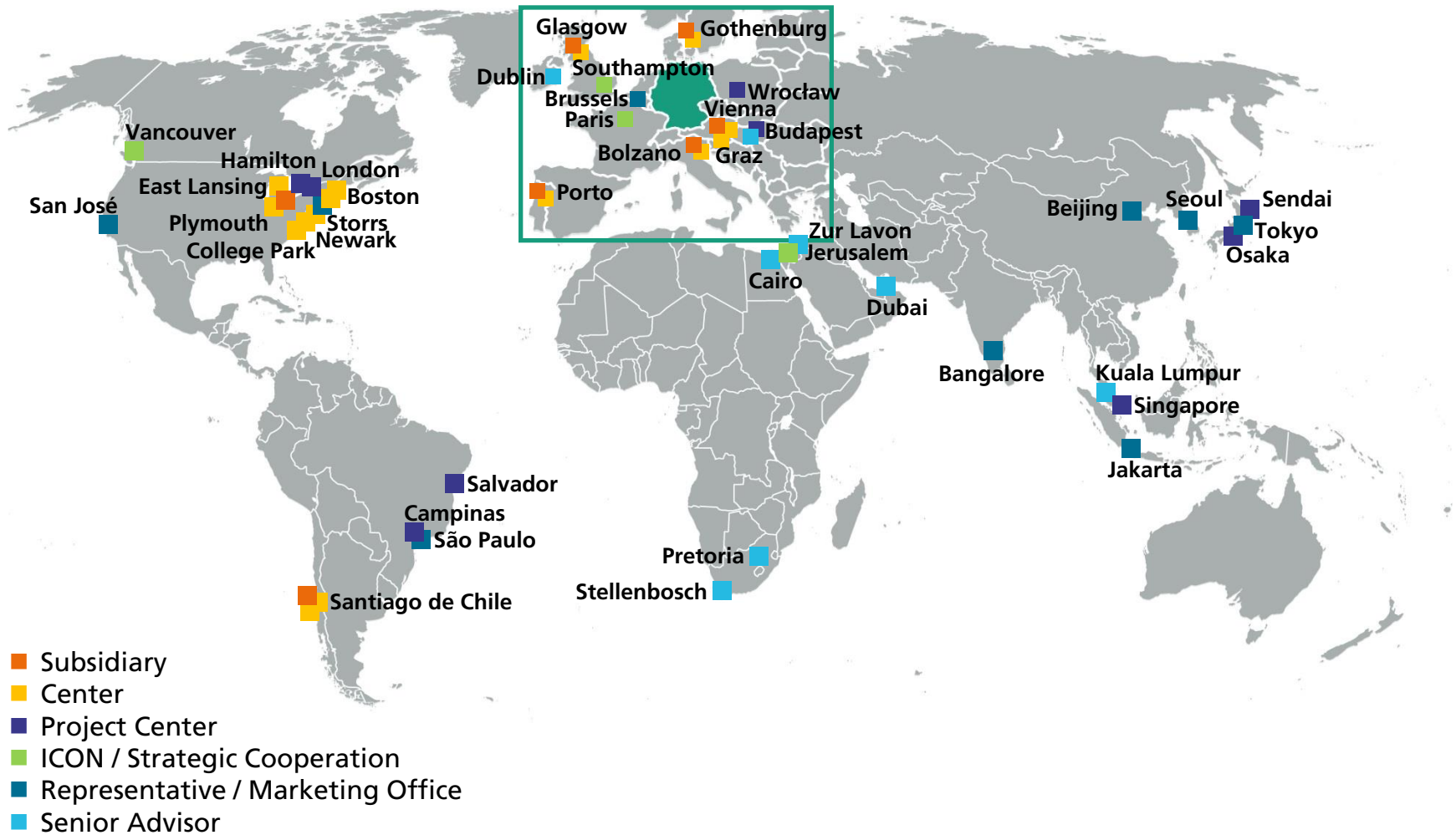
Entrepreneur

Research and
development on
behalf of industry
and state

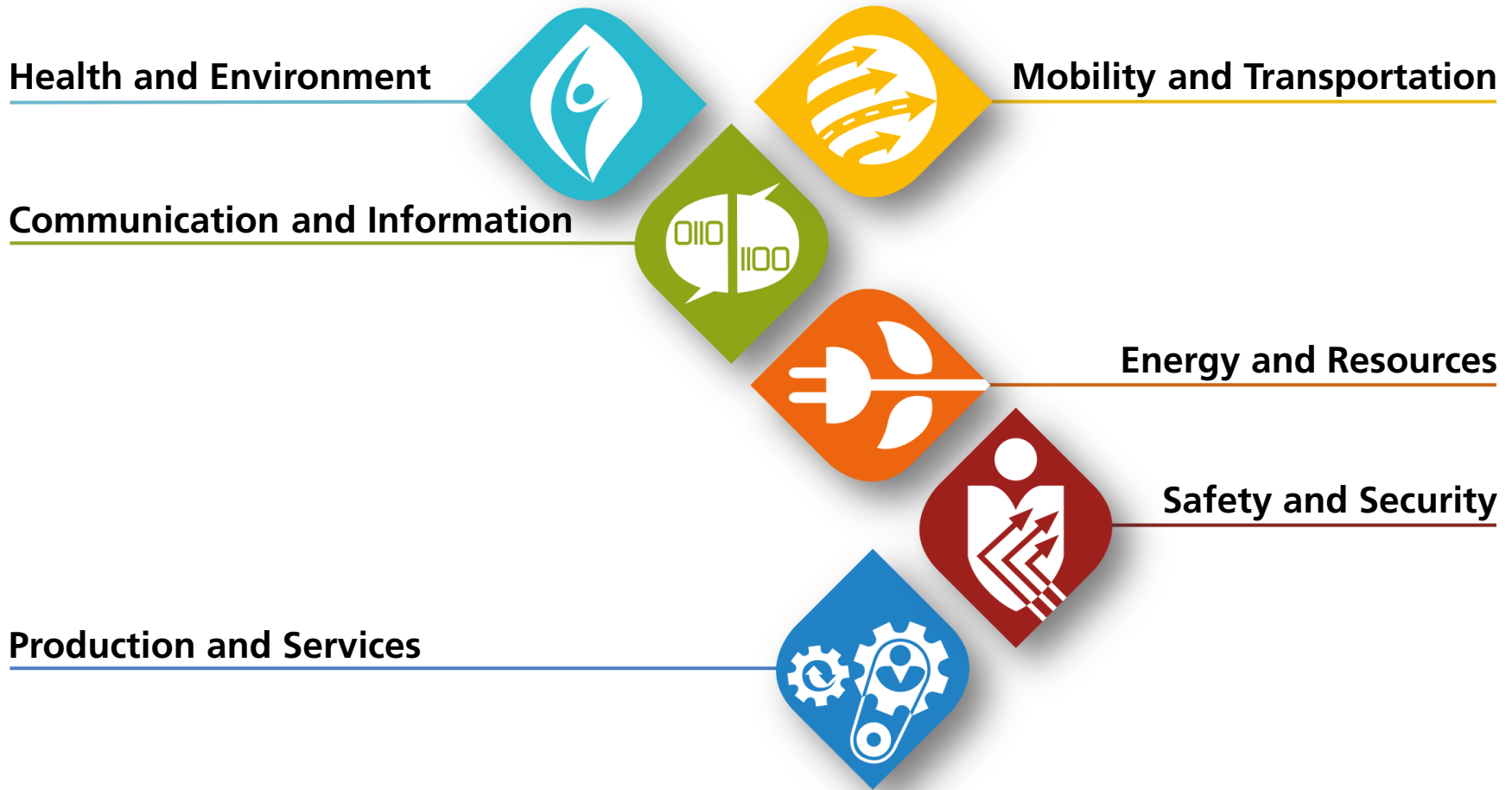
mp3 music format,
white LED, high-
resolution thermal
camera

Research volume:
approx. €2 billion
annually

Fraunhofer worldwide



Fraunhofer fields of research



THE NUTS AND BOLTS OF COOPERATION

How does Fraunhofer help its customers?

IMPROVING PRODUCTS

- Enhanced performance
- Cost efficiency

MOVING FROM PRODUCT DEVELOPMENT TO SHORT-RUN PRODUCTION

- Prototypes
- Manufacturing methods
- Short-run batches

MARKET ANALYSIS AND INNOVATION CONSULTING SERVICES

- Monitoring of technological trends and market developments
- Feasibility studies and return on investment analysis
- Information on sources of funding

INCORPORATING NEW TECHNOLOGIES

- Fraunhofer is at the cutting edge of technological developments and understands how to funnel these into products

THE NUTS AND BOLTS OF COOPERATION

How does Fraunhofer help its customers?

ACQUIRING LICENSES

- Fraunhofer carries out independent pre-competitive research
- Inventions can be commercially exploited under license

OPTIMIZING EXISTING PROCESSES AND ORGANIZATIONAL STRUCTURES

- Pinpoint the best ways to make improvements
- Motivate people to generate innovative ideas
- Reveal and exploit potential

CHARACTERIZATION, TESTING AND CERTIFICATION

- High-quality equipment for a wide range of tests
- Preparation of test reports and certificates

COOPERATION MODELS

What are the different ways of working with Fraunhofer?

ONE-OFF CONTRACTS

- Solve the problem
- Launch the innovation in the business or the marketplace

LARGE-SCALE PROJECTS WITH MULTIPLE PARTNERS

- Cooperation between multiple Fraunhofer institutes, external partners and companies

INTERNATIONAL COOPERATION

- Fraunhofer offices abroad

STRATEGIC PARTNERSHIPS

- Long-term partnerships that evolve from non-contract, pre-competitive research

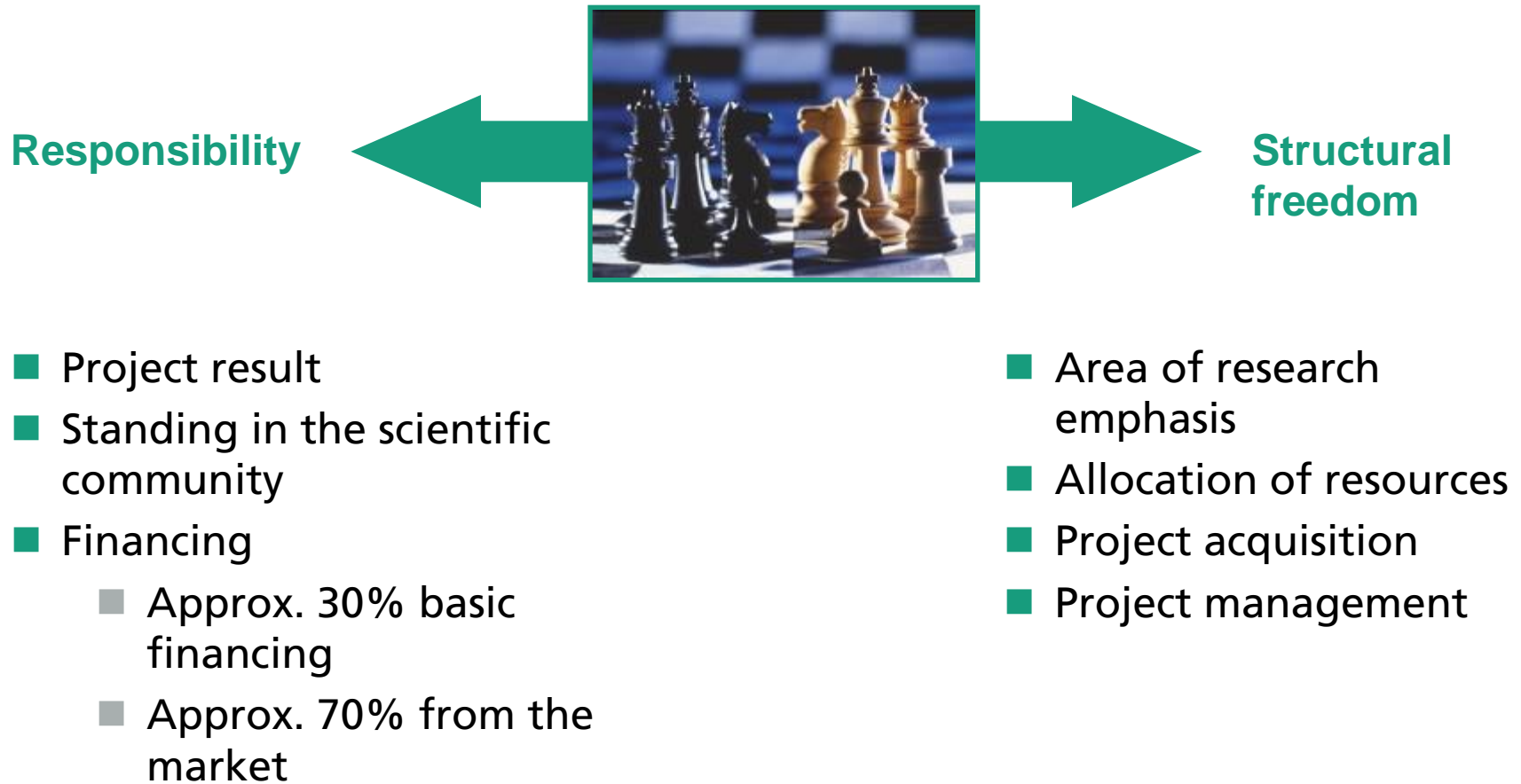
INNOVATION CLUSTERS

- Regional partners from research, industry and universities

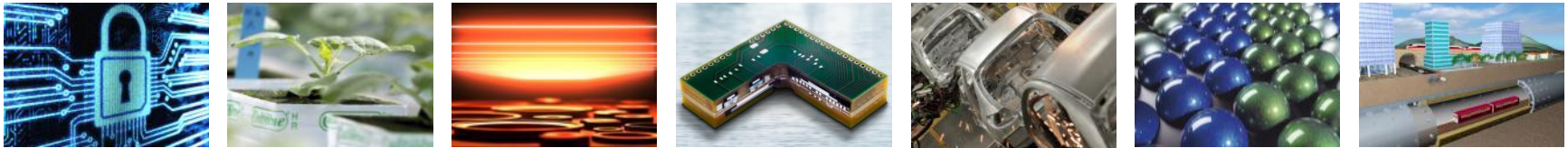
SPIN-OFFS

- Fraunhofer researchers branch out on their own, often with the customer taking a stake

Independence and responsibility of the Fraunhofer Institute



Pooling expertise Fraunhofer Groups



Institutes working in related subject areas cooperate in Fraunhofer Groups and foster a joint presence on the R&D market. They help to define the Fraunhofer-Gesellschaft's business policy and act to implement the organizational and funding principles of the Fraunhofer model.

- ICT
- Life Sciences
- Light & Surfaces
- Microelectronics
- Production
- Materials and Components – MATERIALS
- Defense and Security VVS

Pooling expertise

Fraunhofer Alliances

The Fraunhofer Alliances facilitate customer access to the services and research results of the Fraunhofer-Gesellschaft. Common points of contact for groups of institutes active in related fields provide expert advice on complex issues and coordinate the development of appropriate solutions.



Adaptronics



AdvanCer



Ambient Assisted Living



AutoMOBILE Production



Battery



Building Innovation



Big Data



Cloud Computing



Digital Cinema



Embedded Systems



Energy



Food Chain Management



Additive Manufacturing



Lightweight Structures



Nanotechnology



Photocatalysis



Polymer Surfaces



Cleaning Technology



Simulation



Space



Water Systems (SysWasser)



Traffic and Transportation



Vision

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Discussion

Fraunhofer CML and Hamburg University of Technology

- Fraunhofer-Center for Maritime Logistics and Services (CML)

Applied research

- Shipping
- Ports and Terminals
- Logistics and Services

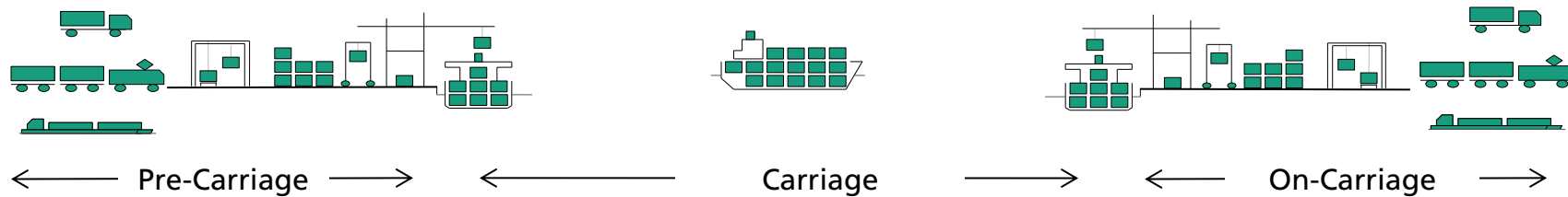
- Hamburg University of Technology
Institute of Maritime Logistics

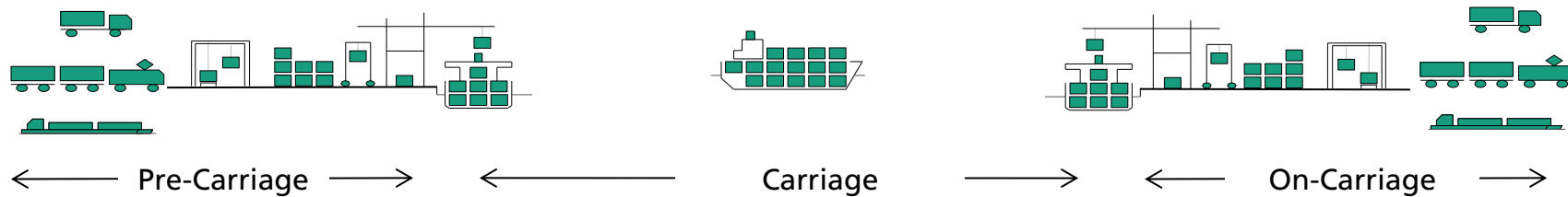
- Teaching and basic research

TUHH
Technische Universität Hamburg-Harburg









Port and Terminal Development



Haptic Planning Table (Touch Screen)



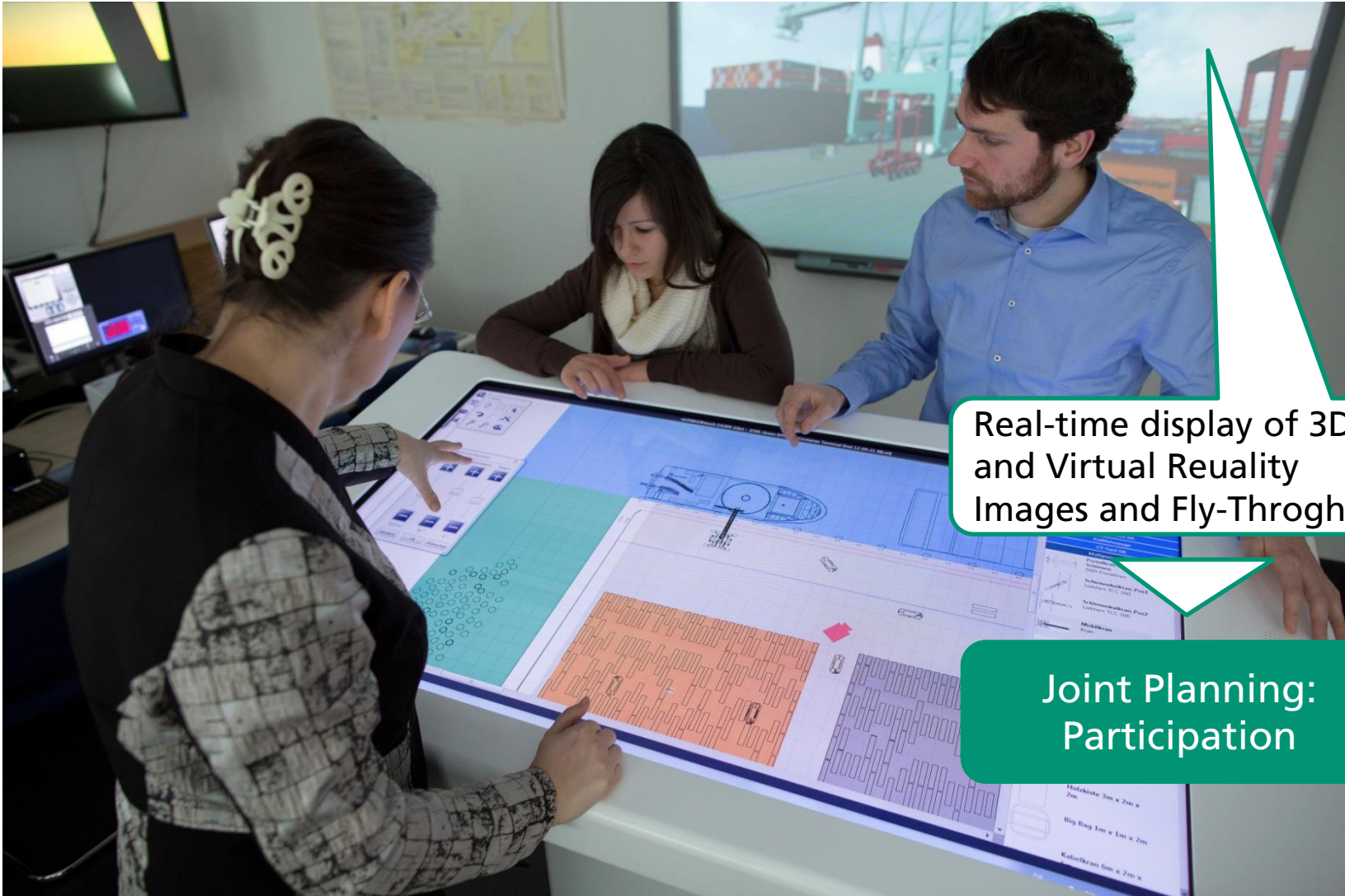
Touch Screen

Comprehensive,
true-to-scale
model library

Drag-and-Drop

Rapid 2D -
Layout Design

Haptic Planning Table: Planning Team in Action



Real-time display of 3D and Virtual Reality Images and Fly-Throgh

Joint Planning: Participation

Planning Table Model



Tool-based Rapid Planning System – “ToolBaR PlannEr”

Visualization
2D/3D-Layout Planning



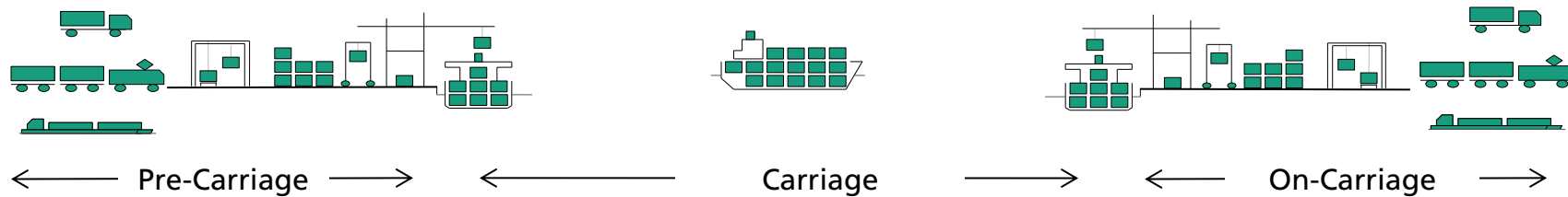
Logistics
Simulation



Data Processing



Shiphandling Simulator



Port and Terminal Development

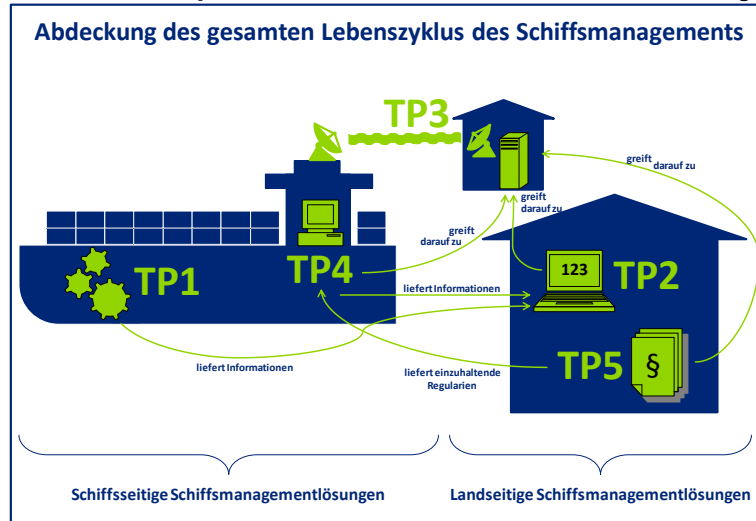


Fleet and Ship Management

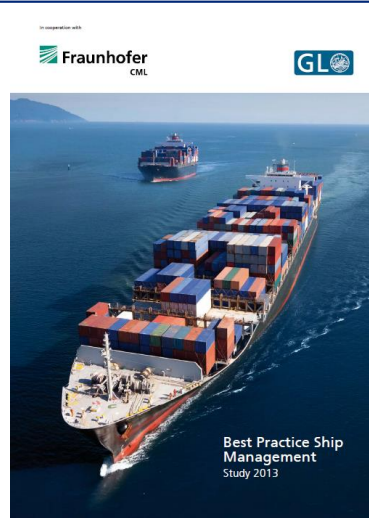


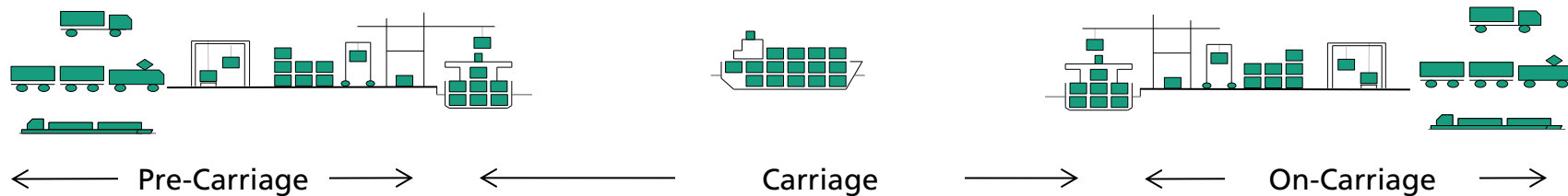
Excellent initiative ship management (EIS)

Development of an industry solution for shipmanagement



- Software innovation and integration project of Hamburg based maritime companies
- Development and Implementation of algorithms
 - Crew supply optimization
 - Materials and spare part procurement optimization
- Maintenance and service concepts optimization





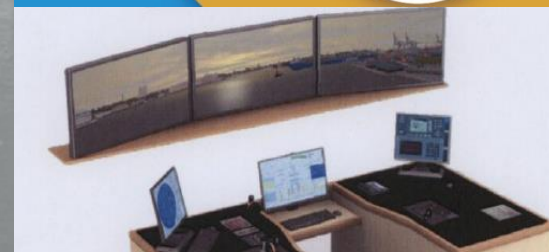
Port and Terminal Development



Fleet and Ship Management



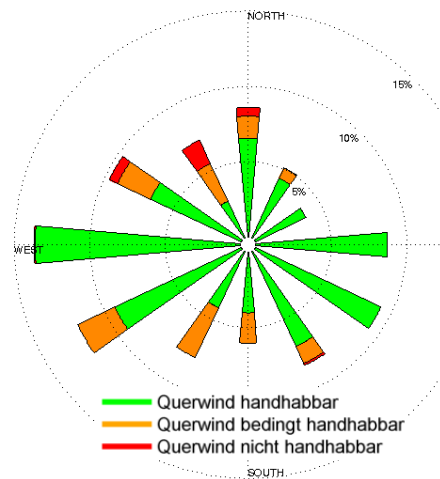
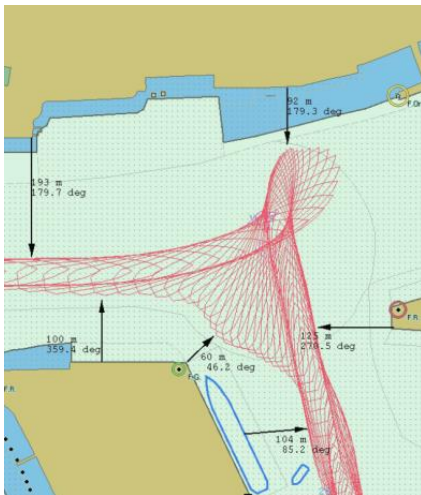
Sea Traffic and Nautical Solutions



Sea Traffic and Nautical Solutions

Simulation-based navigational safety assessment

#	Project steps
1	Defining assessment scenarios
2	Preparing simulation environment
3	Real-time simulation runs
4	Safety assessment



Fraunhofer
CML

FRAUNHOFER CENTER FOR MARITIME LOGISTICS AND SERVICES CML

1 2

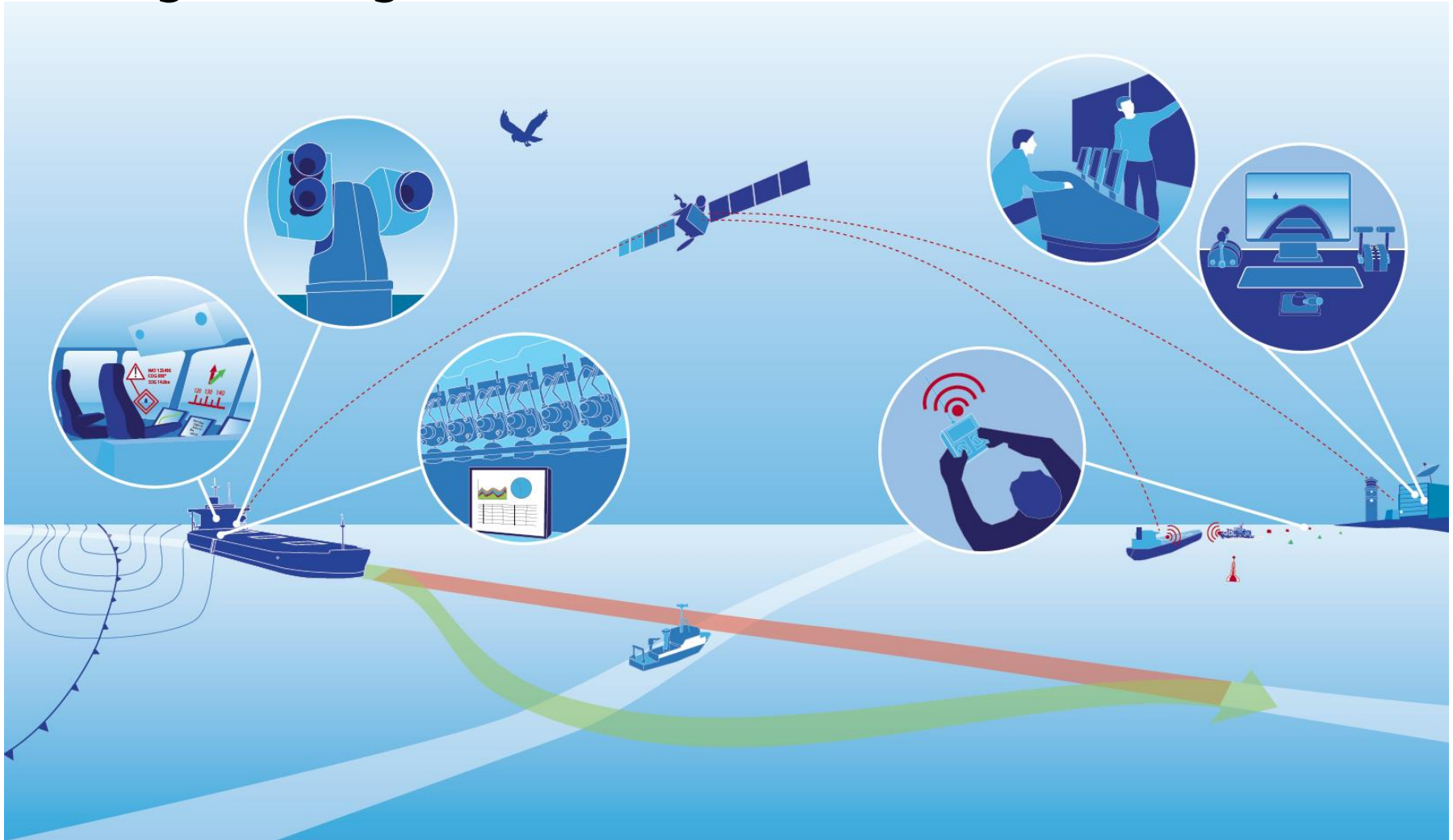
1 © Grecaud Paul - fotolia.com
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**SIMULATION-BASED
NAVIGATIONAL SAFETY
ASSESSMENT**

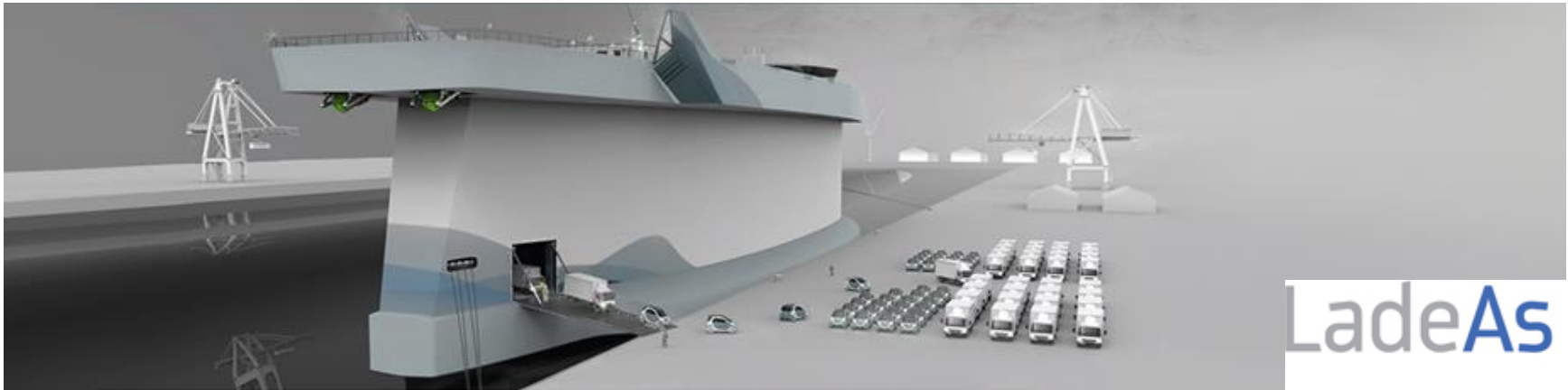
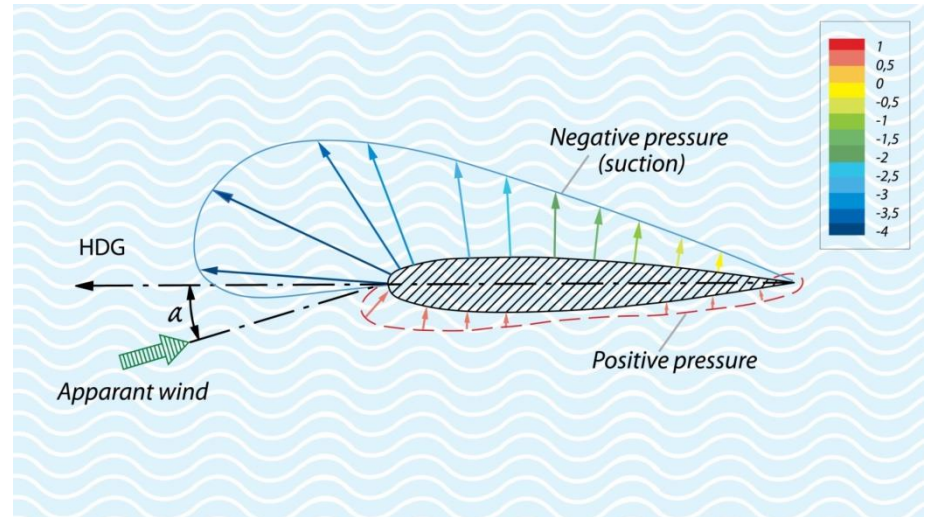
Service portfolio

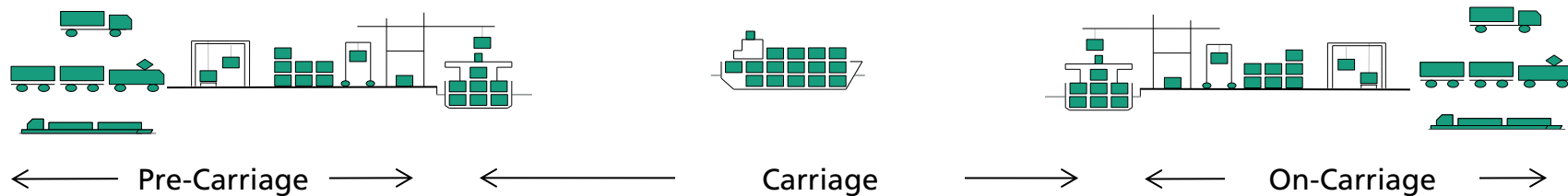
- Safety assessments
- Time window evaluation
- Maneuver optimization

Maritime Unmanned Navigation through Intelligence in Networks (MUNIN)



Vindskip™ - Weather Routing Module





Port and Terminal Development



Fleet and Ship Management



Sea Traffic and Nautical Solutions



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Thank You Very Much For Your Attention!

[Quelle: Hafen Hamburg HHM / M.
Lindner]

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 **Fraunhofer**
CML

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