JORES JOINT RESEARCH PROJECT:

NUMERICAL METHODS VALIDATION

FOR DESIGNING AND BUILDING MORE ADVANCED

AND ENERGY EFFICIENT SHIPS

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The revised IMO GHG strategy

- **2008 as base year**
- **Peak as soon as possible**
- **Total: 20% reduction**
- **Intensity: 40% reduction**
- **Fuel: 5% energy share**
- **Total: 70% reduction**
- **Net-zero GHG emissions by 2050**

**Total:** Well-to-wake GHG emissions; **Intensity:** CO₂ emitted per transport work; **Fuel:** Uptake of zero or near-zero GHG technologies, fuels and/or energy sources
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DNV Maritime forecast to 2050

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We could not make it 50 years ago
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We have all the necessary tools now
What can we do?
What can we do?

Propeller optimisation
What can we do?

Propeller optimisation
Hull optimisation
What can we do?

Propeller optimisation
Hull optimisation
Energy Saving Device (ESD) optimisation
What can we do?

Propeller optimisation

Hull optimisation

Energy Saving Device (ESD) optimisation

Optimisation of the entire system (Hull + Propeller + ESD etc)
What can we do?
What can we do?

Optimisation for contractual (ideal) sea trials condition
What can we do?

Optimisation for contractual (ideal) sea trials condition

Optimisation for real sea condition
What can we do?
What can we do?

Optimisation for smooth hull and propeller
What can we do?

Optimisation for smooth hull and propeller

Optimisation for real conditions of hull and propeller
What can we do?

Optimisation for smooth hull and propeller

Optimisation for real conditions of hull and propeller
Happy days?
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Not really! Unfortunately, digital technologies require validation!
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Computational Fluid Dynamics
Happy days?

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Project Participants (50+ companies)
JoRes project – a global initiative to develop validation cases
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Governments funding
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European Union funding
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Project funded by the participants (1.5 million Euro)
Project Vessels

A general cargo vessel
A tanker
A twin-screw ferry
A cruise liner

A tug boat
A bulk carrier
A vessel
A vessel
JoRes project – a global initiative to develop validation cases

All the results and geometry files will be available in the public domain in 2024
Together we can make it!

Energy Efficiency

Carbon-neutral fuels

2008 as base year

Peak as soon as possible

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Intensity: 40% reduction

Fuel: 5% energy share

Total: 70% reduction

Net-zero GHG emissions by 2050

Emission pathway in line with IMO’s revised GHG strategy

Emission pathway in line with IMO’s 2018 GHG strategy

Business-as-usual emissions

Emission gap

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