Plan Overview

A Data Management Plan created using DMPonline

Title: Study of non carbon fuels for marine transportation

Creator: Terese Lovas

Principal Investigator: Terese Lovas

Affiliation: Other

Template: DCC Template

ORCID iD: 0000-0003-2010-394X

Project abstract:

The objectives of this project is to study two alternative novel concepts of ammonia/hydrogen engines for maritime application, addressing both technical/scientific aspects, and social/economical/regulatory aspects, and to develop guidelines for designing ammonia/hydrogen marine engines. By combining complementary competence in the field from four universities in Nordic countries (Lund Univ, Sweden, World Maritime Univ, Sweden, Aalto Univ, Finland and NTNU, Norway) and having support from world-leading marine engine companies based in Nordic region (Wärtsilä and MAN), as well as ship owners Stolt Tankers and ForSea to build a Nordic network in ammonia/hydrogen marine engine R&D, by sharing chemical kinetics modelling, computational fluid dynamics simulations, laboratory engine
experiments, and social/economical/regulatory assessment. By creating critical mass we aim at enhancing scientific excellence, creating social impacts, and contributing to research-based policymaking.

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Study of non carbon fuels for marine transportation

Data Collection

What data will you collect or create?

Develop a chemical kinetic mechanism of ammonia co-firing with high reactivity fuels such as hydrogen and n-heptane (a surrogate of diesel). The design of ammonia/hydrogen co-combustion in marine engines requires knowledge of chemical kinetics to understand the ignition, flame propagation, as well as pollutant emission formation. Chemical kinetic mechanisms describes the combustion of ammonia/hydrogen mixture with ignition improver (such as n-heptane). One important issue of ammonia/hydrogen engines is the emission of N2O, which is a greenhouse gas (GHG) of high impact. It is hypothesised that by co-combustion of ammonia with hydrogen, N2O emission can be reduced.

How will the data be collected or created?

Data will be collected through simulations using CFD tools

Documentation and Metadata

What documentation and metadata will accompany the data?

Documentation of the mechanisms will be published in open-access journal papers. Metadata will also be documented in the publications in terms of the definition of validity ranges.

Ethics and Legal Compliance

How will you manage any ethical issues?

There are no ethical issues related to this work.

How will you manage copyright and Intellectual Property Rights (IPR) issues?

Data will be openly published and shared in publications. The mechanism will be made available for download on group website.

Storage and Backup

How will the data be stored and backed up during the research?

The mechanism and generated data are stored on NTNU storage facilities such as NTNU Box.

How will you manage access and security?

As data and results are published in open access papers, only the source code for the actual mechanism should be stored for security reasons. Even if lost, the actual mechanism will be available for recreation from published papers.

Selection and Preservation

Which data are of long-term value and should be retained, shared, and/or preserved?

No long-term value data will be preserved. Once the mechanisms are available, new data will and should be generated depending on new conditions and technical development.

What is the long-term preservation plan for the dataset?

NA

Data Sharing

How will you share the data?

Potential users of the chemical scheme will access this from the website. We will share this with project partners who are open to use this in their own simulations. Further publications from this work should site the original source.

Are any restrictions on data sharing required?

NA

Responsibilities and Resources

Who will be responsible for data management?

The PI is overall responsible for the data/chemical mechanism.

What resources will you require to deliver your plan?

Access to NTNU Box. Group website hosted by institution NTNU.