

## STUDENT PROJECT PROPOSAL

### WASTE HEAT RECOVERY ON BOARD LIQUEFIED NATURAL GAS-FUELLED VESSELS

Liquefied gas (LNG) is expected to become a widely used fuel for shipping in the near future and the implementation of waste heat recovery (WHR) units is an effective method of attaining fuel savings. The organic Rankine cycle (ORC) power system represents a viable technology to be implemented on board vessels as a way to convert the main engine waste heat into useful power. Previous investigations have shown that, depending on the case study, fuel savings in the range 6 – 10 % can be obtained.

With the purpose of deriving guidelines for the optimal integration of ORC units on board LNG-fuelled vessels, several student projects can be carried out. The projects could be connected, but not limited, to one of the following topics:

- 1) Optimal integration of ORC units on board vessels equipped with exhaust gas recirculation (EGR) unit – case study in collaboration with MAN Diesel & Turbo;
- 2) Derivation of data-driven models to simplify the optimization of ORC units;
- 3) Combined production of power and cooling for fishing vessels;
- 4) Comparison of the prospects for waste heat recovery on board two-stroke and four-stroke engines;
- 5) Optimal design and control of an intermediate oil loop to transfer the waste heat from the exhaust gases to the ORC unit;

According to the personal preferences of the candidate, topic and extend of the work can be adjusted. Please contact Enrico Baldasso ([enbald@mek.dtu.dk](mailto:enbald@mek.dtu.dk)), Maria Mondejar Montagud ([maemmo@mek.dtu.dk](mailto:maemmo@mek.dtu.dk)) or Fredrik Haglind ([frh@mek.dtu.dk](mailto:frh@mek.dtu.dk)) for further information.