

GasDrive

LNG fuelling System Integration: a research proposal

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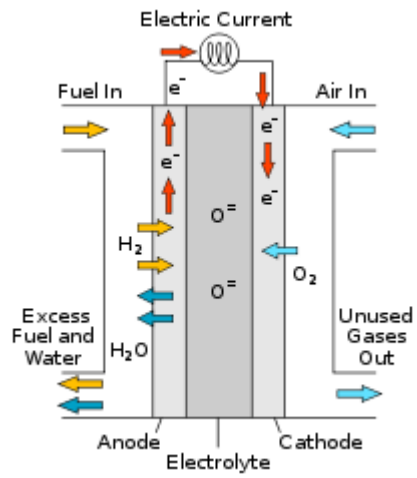
Urgent Maritime challenges:

- Reduce the energy consumption
- Reduce the greenhouse gas production in air
- Reduce/eliminate harmful emissions in air

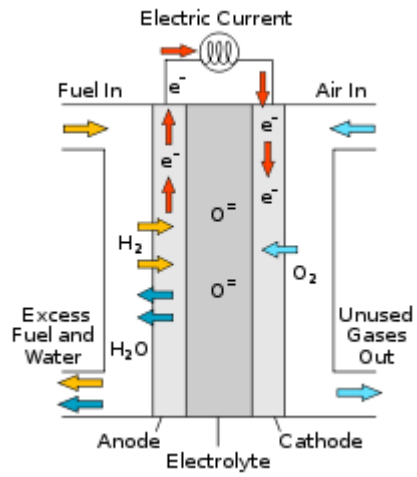
And, related:

- Reduce the resistance of the ship
- Prevent the fouling of the underwater hull
- Reduce infrared and noise signatures

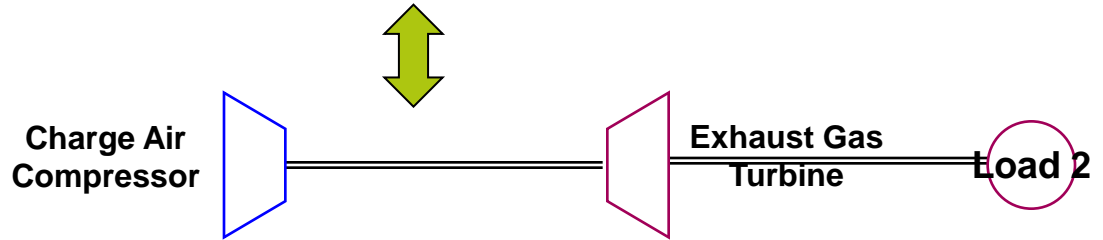
Fuel cell



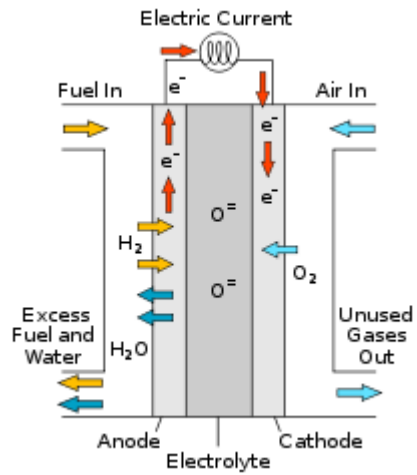
Fuel cell



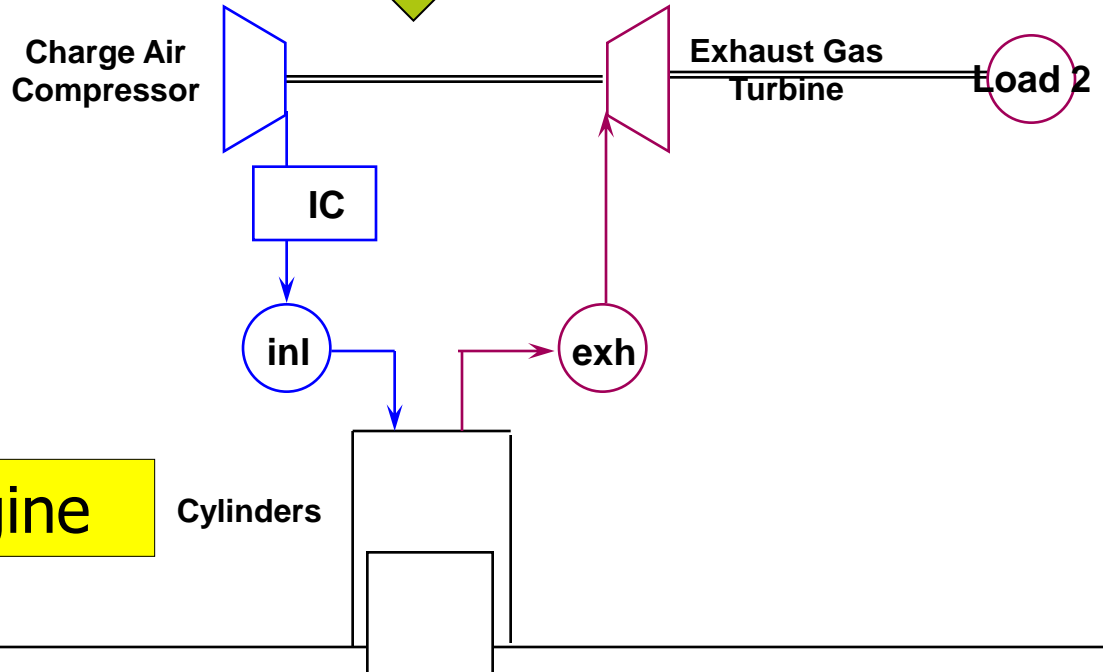
Gasturbine



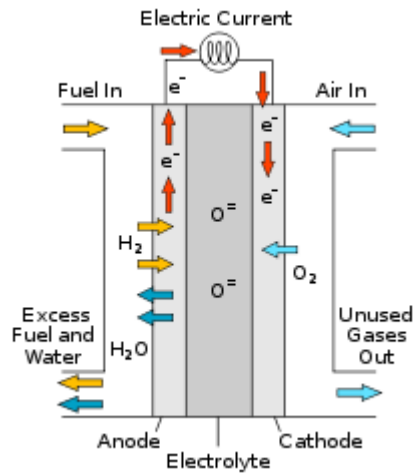
Fuel cell



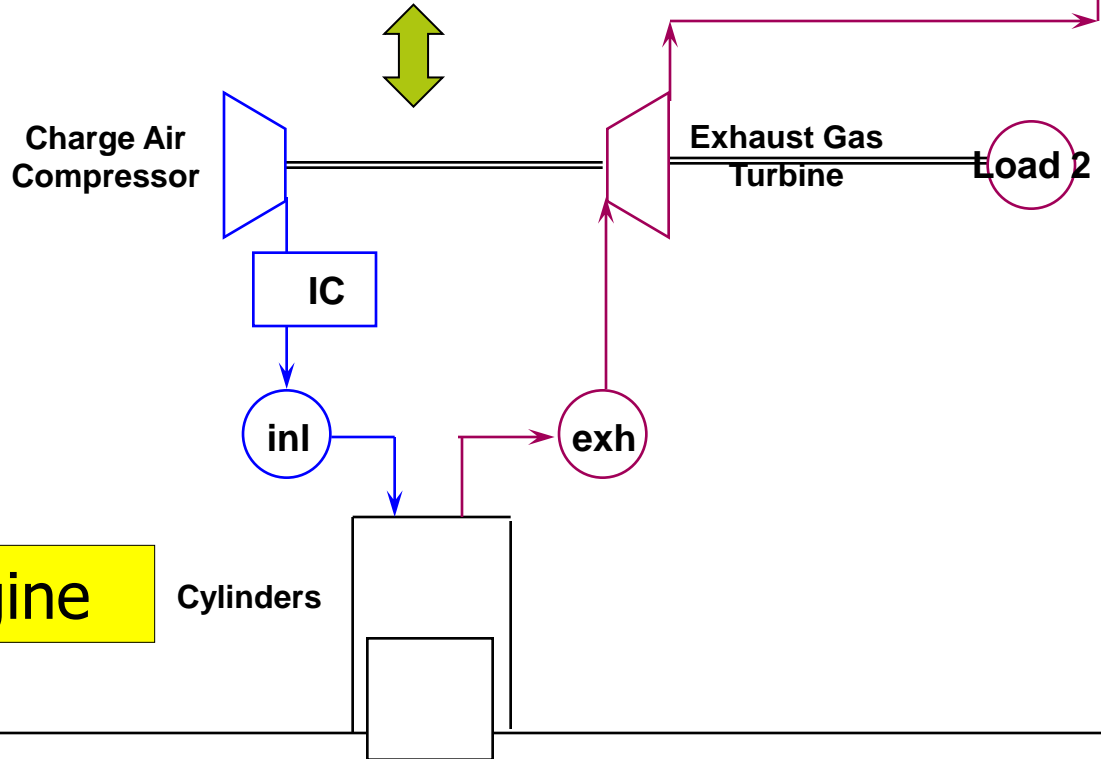
Gas engine



Fuel cell

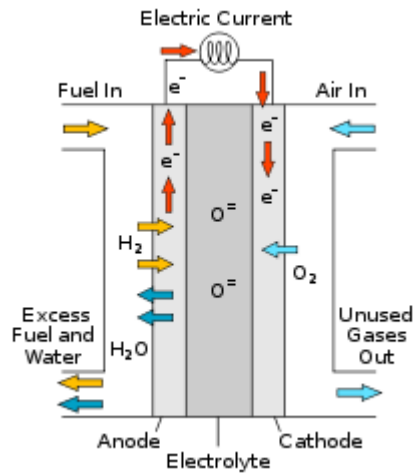


UW exhaust

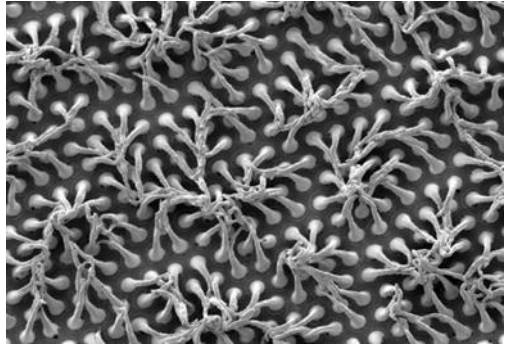
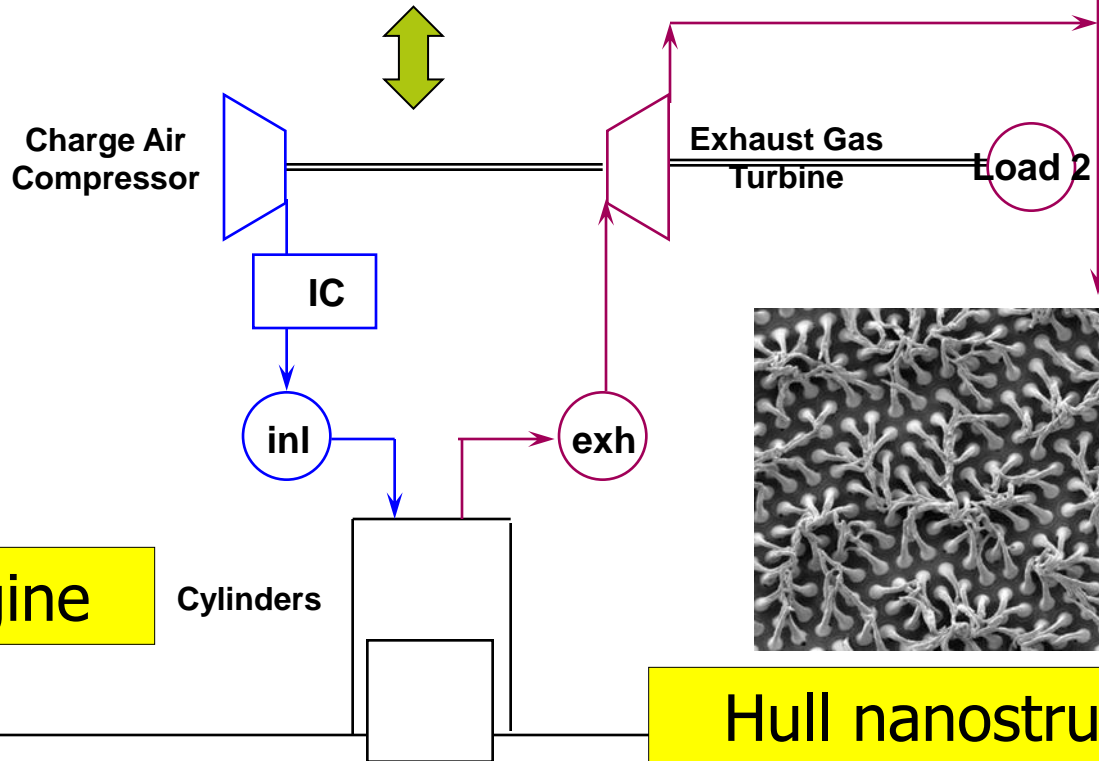


Gas engine

Fuel cell



UW exhaust



Hull nanostructure

Benefit potential for co-financing partners

A small investment (40-50 k€ per partner) with a leverage for a 1+ M€ fundamental research program with 4 universities, 4 disciplines, with a potential for business game-changers on:

- total efficiencies (fuel cell included) higher than 60%
- no direct CO₂-emission in air, 50% reduction in CO₂-emission
- silent operation in harbour conditions
- Environmental ship operation flexibility in Emission Control Areas, coastal areas and ports
- fouling free underwater coating during ship operation

Research partners

- TU Delft: Maritime Technology and Process & Energy



- Netherlands Defence Academy
(experimental facilities)



- Technical University Twente
(nanotechnical part)

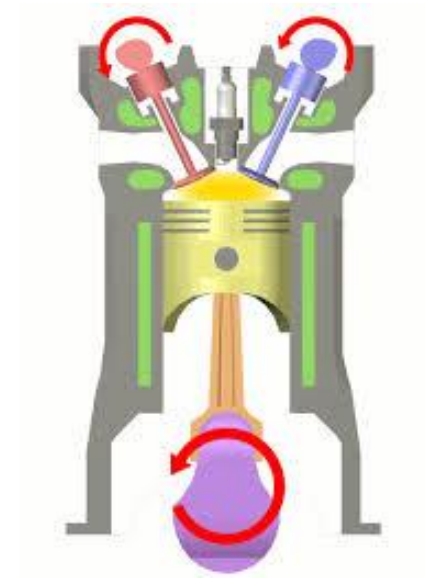
UNIVERSITEIT TWENTE.

- IMARES
(environmental effects of exhaust
gas in water)



Co-financing partners invited!

- Shipyards: the business of very high efficiency/very low resistance ships
- Engine manufacturers: new solutions for novel system integration
- Energy companies: LNG supply as a maritime paradigm shift
- Coating manufacturers: revolutionary clean and low drag underwater hull material
- Shipping companies: environment flexibility in coastal and emission control area's and silent operation in ports, even with future legislation
- Government: very significant reduction of greenhouse gas emission
- Ship system integrators: control algorithms for new integrated systems
- Defence/security: significant reduction in noise and infrared signature



Questions?



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