Care of Offshore Marine Environment in an Unlikely Place

Peter Dow

Graduate Naval Architect

Interactive Workshop on Care of Offshore Marine Environment 2014

COME 2014
University of Strathclyde
8th & 9th April 2014

WHAT is Care of Offshore Marine Environment

Personal Views:

- Ensuring environmental sustainability
- Reduction in pollution and resource usage

WHY Care of Offshore Marine Environment

- Financial

- Legal / Regulations

Lloyd's Register

DNV

IMO

- Moral
  - Global warming
  - Acid rain
  - Looking to the future

WHAT

WHY

EXAMPLE (FESW)

IMPLEMENTATION

CONCLUSIONS

Future Environmentally Sensitive Warship – COME EXAMPLE

- BASIS - FESW Paper Offshore Patrol Vessel
  - Author Keir Gravil
  - NDP (MOD Led)
- Design an Offshore Patrol Vessel (OPV) for the year 2035
- Ensure Environmentally Sustainable Design

WHAT

WHY

EXAMPLE (FESW)

IMPLEMENTATION

CONCLUSIONS

Requirements

- Vessel Requirements
  - Patrol duties for overseas territories
  - Fishery protection
  - Disaster relief assistance
  - 30 day endurance

- Environmental Sustainability
  - Low fuel consumption
  - Sustainable materials
  - Use of renewable energy

WHAT

WHY

EXAMPLE (FESW)

IMPLEMENTATION

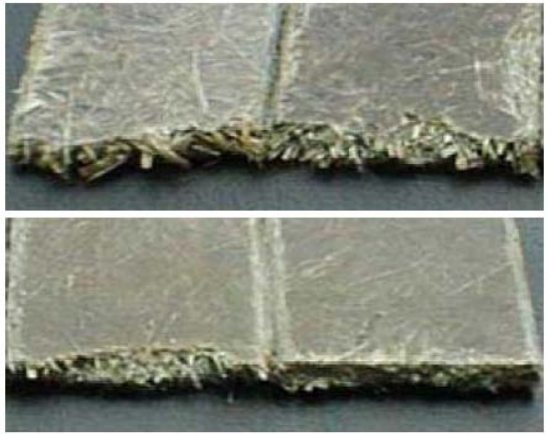
CONCLUSIONS

Hullform Design - Materials

- Natural Fibre Composite materials

(Including Hemp- and flax-based natural fibre composite)

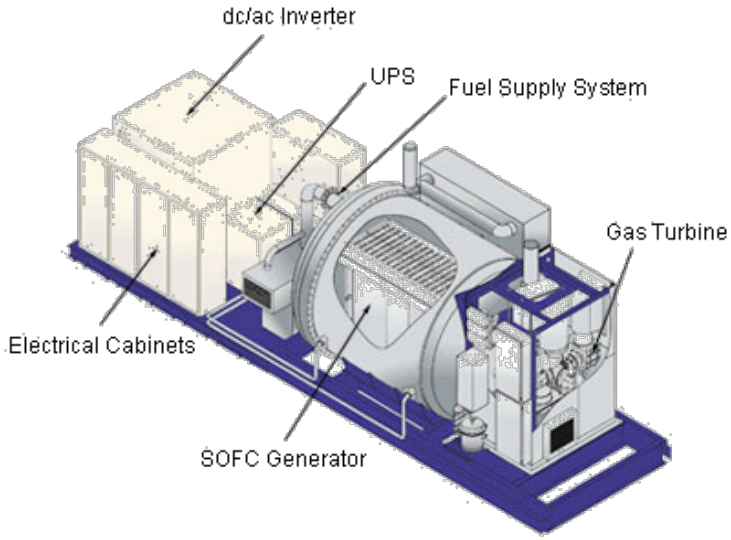
- Renewable resources, low density and cheap
- CO2 neutral and biodegradable
- Low manufacturing energy



Flax fibres [Bos, 2004]

Powering

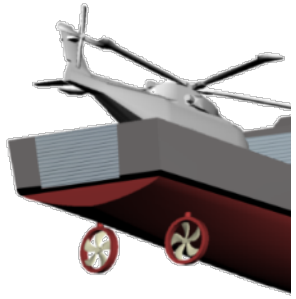
- Integrated full-electric propulsion
  - Solid Oxide Fuel Cells with exhaust turbines
  - Improved Fuel Consumption
  - Reduced Emissions
    - Lower CO_2
    - Negligible SOx and NOx



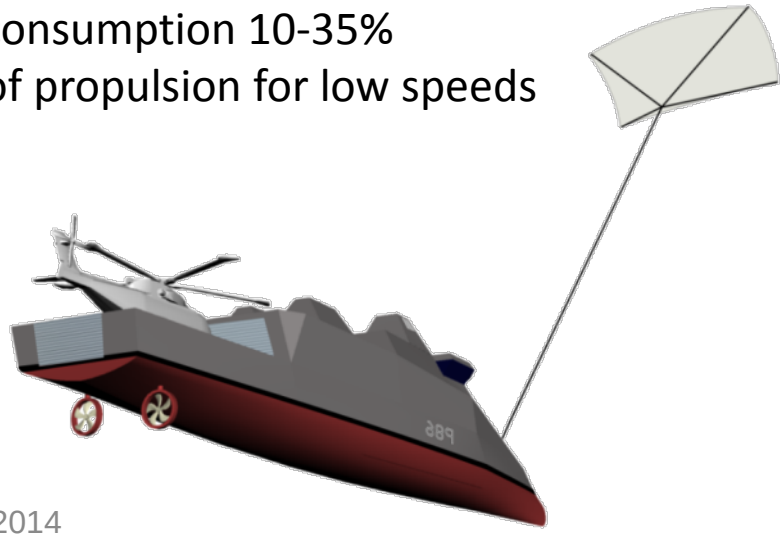
The Siemens combined SOFC system

Propulsion

- Primary: Rim-drive podded propulsors
  - Lighter and more compact
  - Improved open-water efficiency
  - Reduced / No cavitation



- Secondary: 'SkySails'
  - Decreased fuel consumption 10-35%
  - Primary means of propulsion for low speeds



WHAT

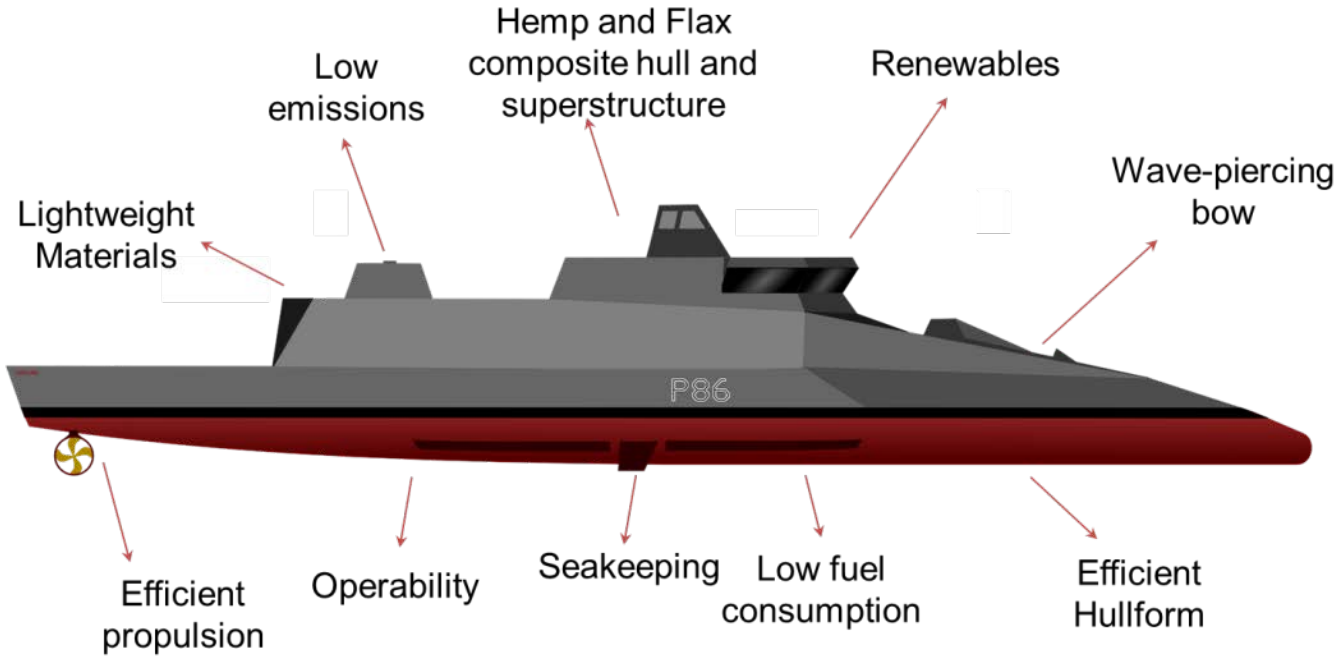
WHY

EXAMPLE (FESW)

IMPLEMENTATION

CONCLUSIONS

Completed Design



WHAT

WHY

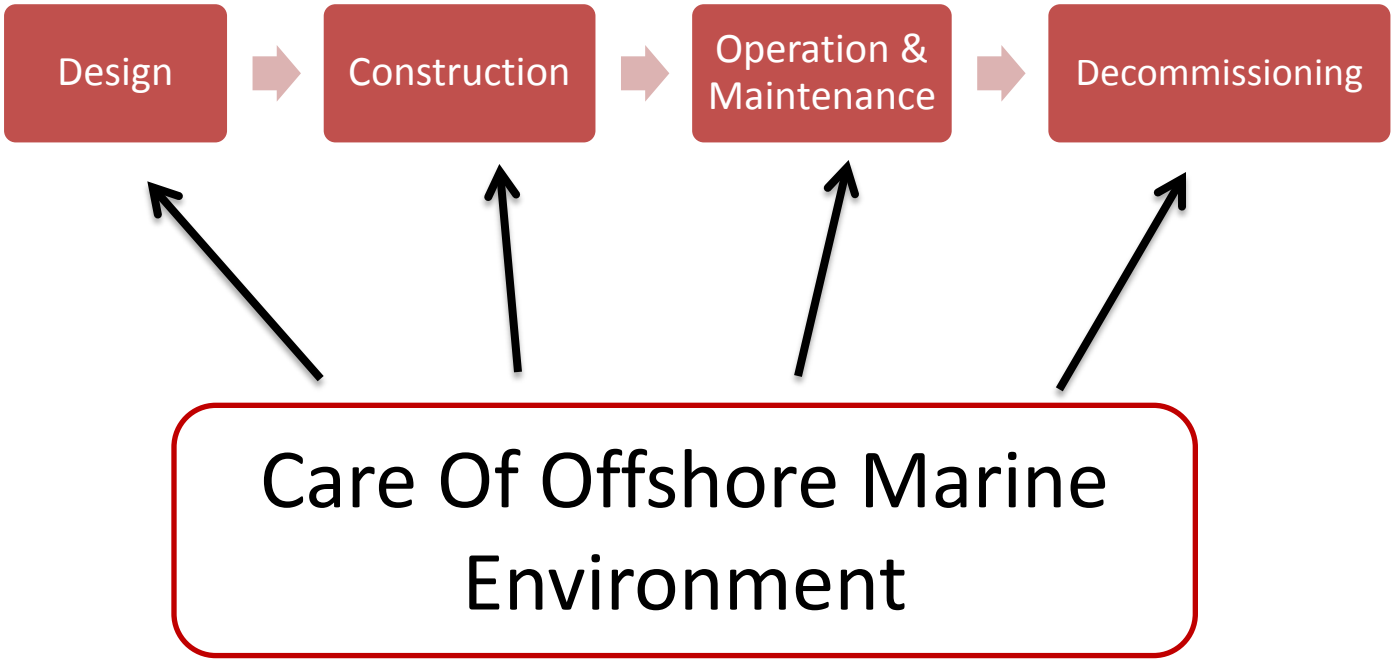
EXAMPLE (FESW)

IMPLEMENTATION

CONCLUSIONS

Implementing COME

- Full lifecycle should be considered



WHAT

WHY

EXAMPLE (FESW)

IMPLEMENTATION

CONCLUSIONS

Conclusions

- Risks - Technological Immaturity
  - Availability
  - Cost
- COME Financial, Legal & Moral Incentives
  - Considered over full lifecycle

Thanks for your attention!