

Methanol based range extender for high-speed electric boats

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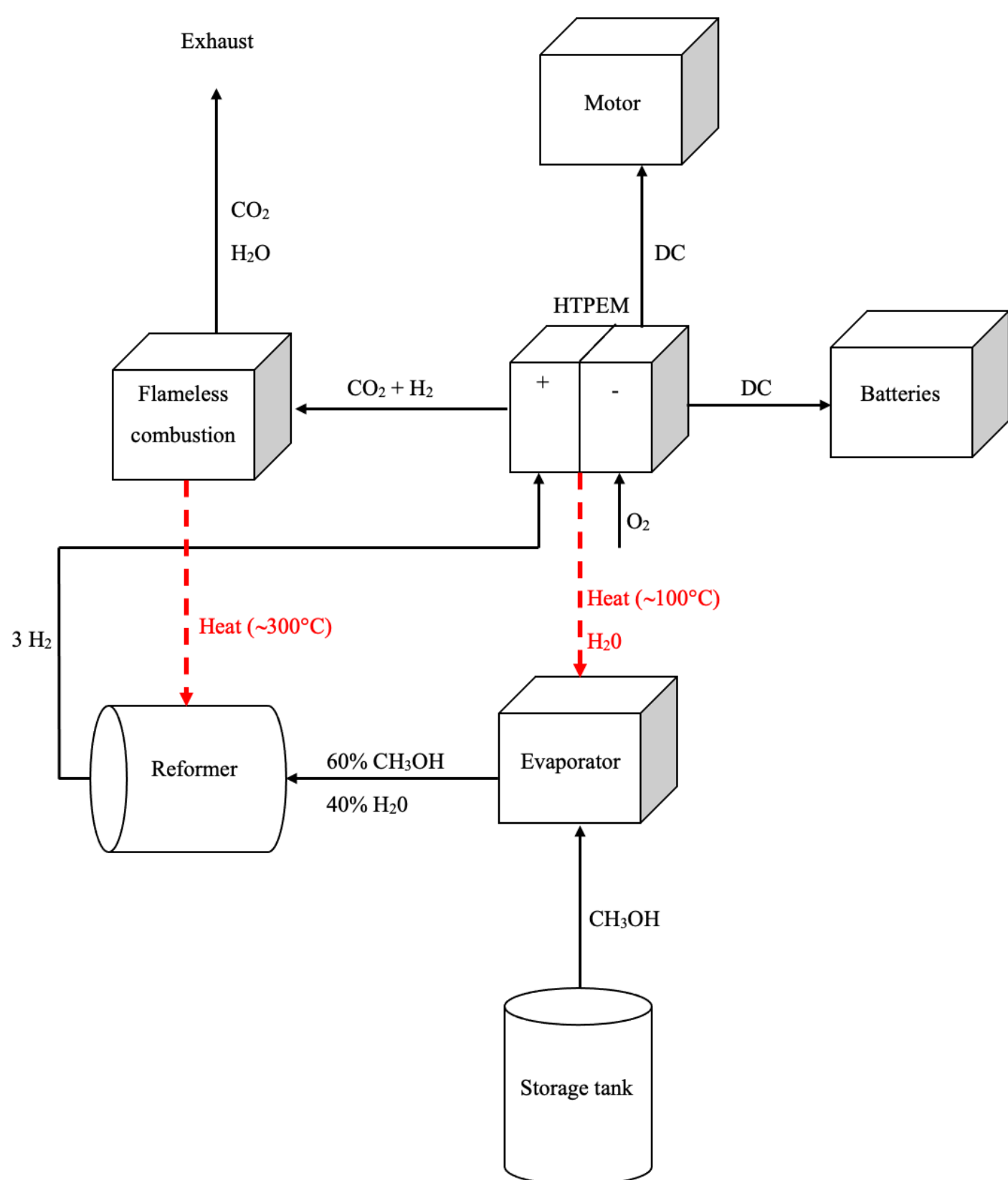
Topic: Methanol based range extender for high-speed electric boats.

Two methods are considered:

- A) Using methanol directly into relevant fuel cell
- B) Reforming methanol into hydrogen and then using it in a hydrogen fuel cell

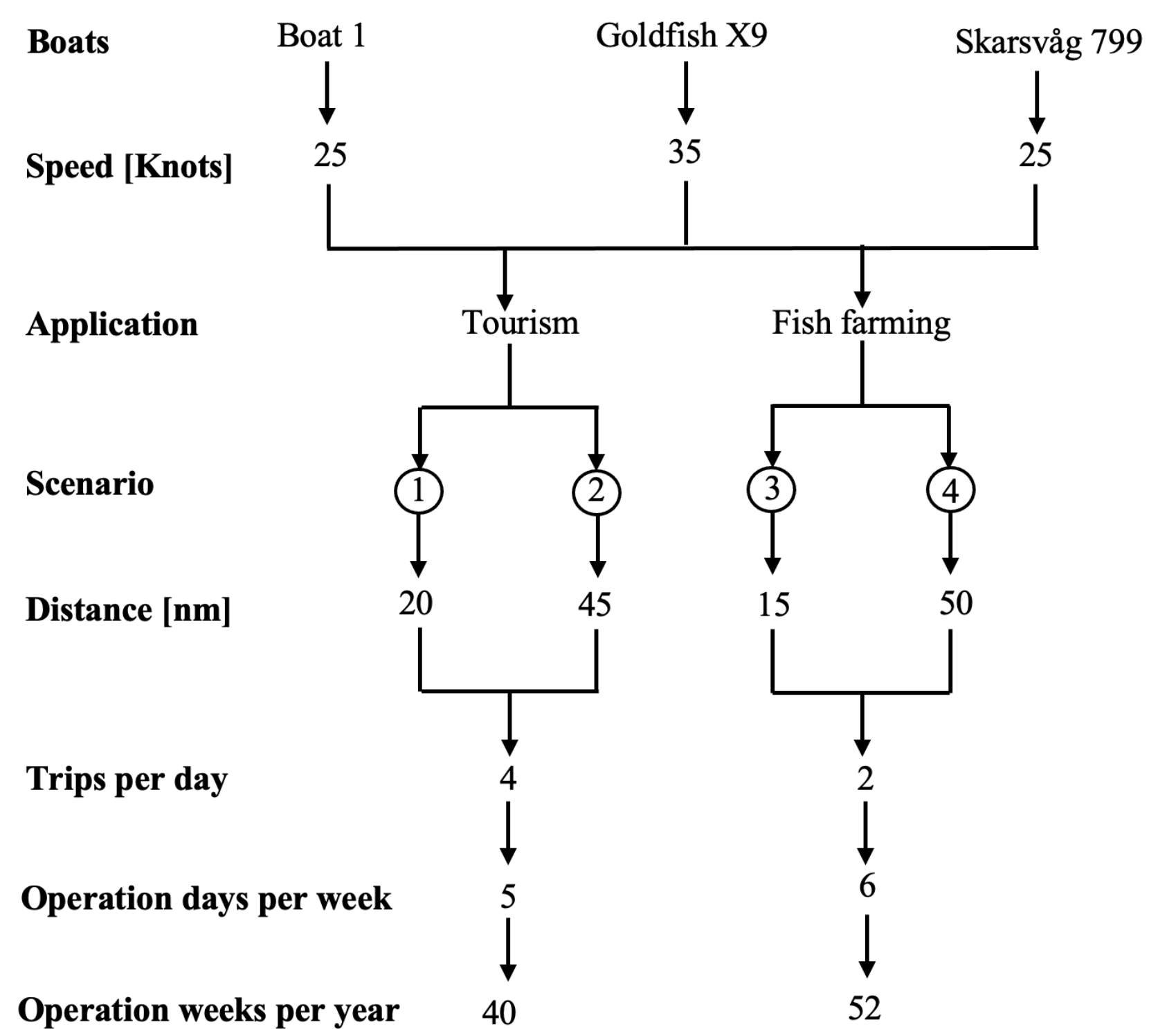
Background

Battery electric boats are an increasingly common solution to the transition of decarbonisation. The current battery technology limits the range of electric boats, but this can be solved by installing a range extender. This thesis investigates methanol based range extenders. Methanol has several advantages compared to other green fuels. Green methanol is carbon neutral and will contribute to reducing greenhouse gas emissions.



Conclusion

All of the three boats will provide cost savings, compared to a traditional diesel-powered boat. The savings will vary in the different scenarios, but they all lie between 6-24 MNOK.



Results

All of the three boats will need a range extender for driving 45 nm and up. The range extender system includes the electric motor system and Blue World Technologies' HTPEM fuel cell system.

The fuel cell system combines heat and power. Waste heat from the fuel cell is transferred to the evaporator. Residues of hydrogen and carbon burn in a flameless burner, which produces heat that is transferred to the reformer.

