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Why SMRs are crucial for hard-to-abate sectors such as shipping and what to do about it

The marine industry consumes about 300 million tonnes Heavy Fuel Oil (HFO) annually (Jacoby 2022), emitting 3% of total global climate gas emissions (King 2022). Worse, the emissions are expected to grow to more than 10%. Then, add local- and regional shipping using marine diesel oil.

Currently, green ammonia is the focal point as a possible alternative to HFO to decarbonize shipping (King 2022). Yet, the amount of electricity required to produce the equivalent amount of green ammonia is about 7,800 TWh/yr, or more than 2.7 times the total EU electricity production in 2022 (Emblemsvåg 2024). The light water reactors have historically demonstrated that they are too costly for this purpose, so here we present the Generation IV SMR technologies that have the potential to commercially enable zero-emission shipping. Indeed, some Generation IV SMRs may outcompete HFO on costs (Emblemsvåg 2021). The paper will end by discussing the challenges to solve.

References

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