GHG emissions and the energy transition from oil and gas to renewables

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SUT Workshops
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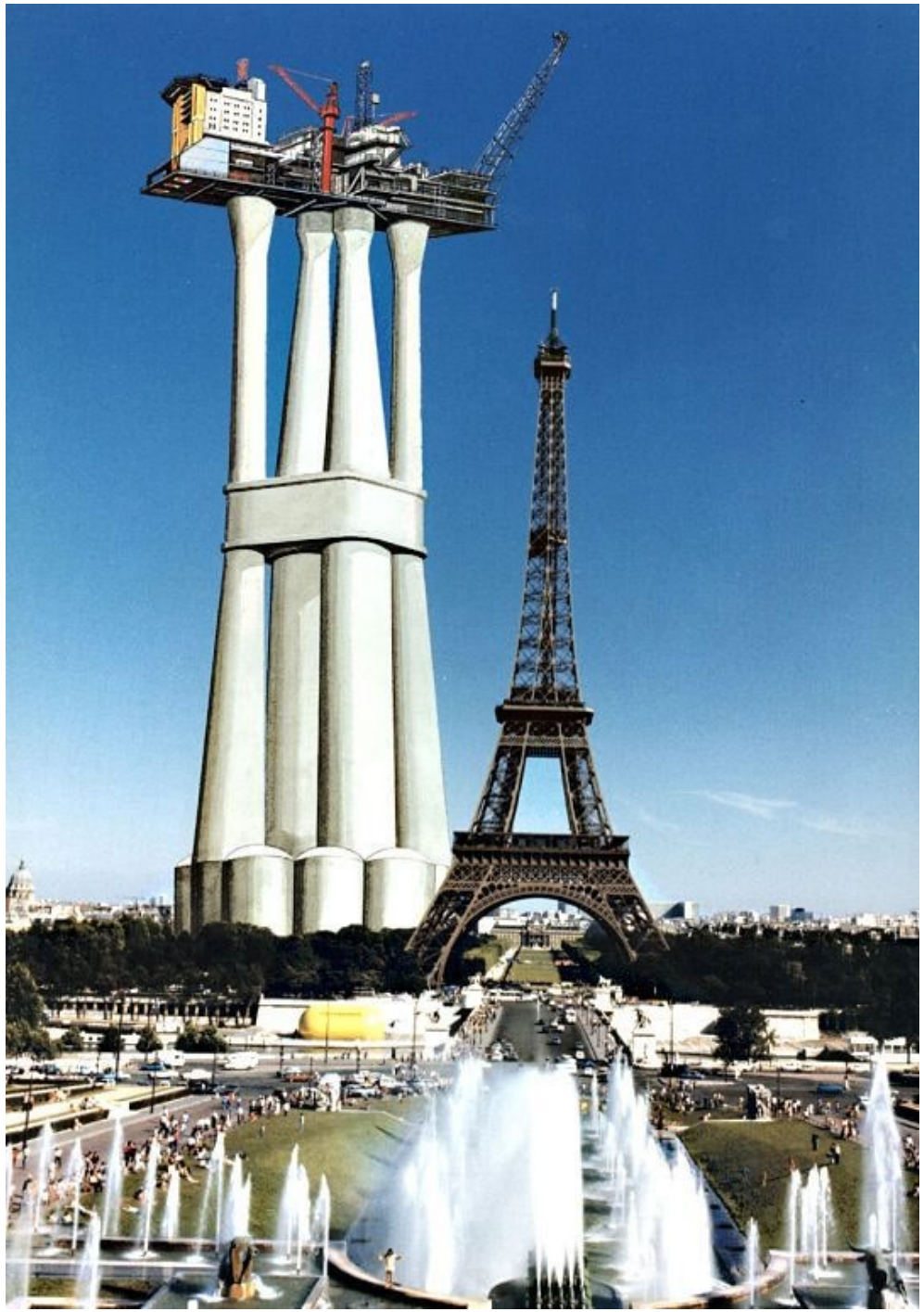
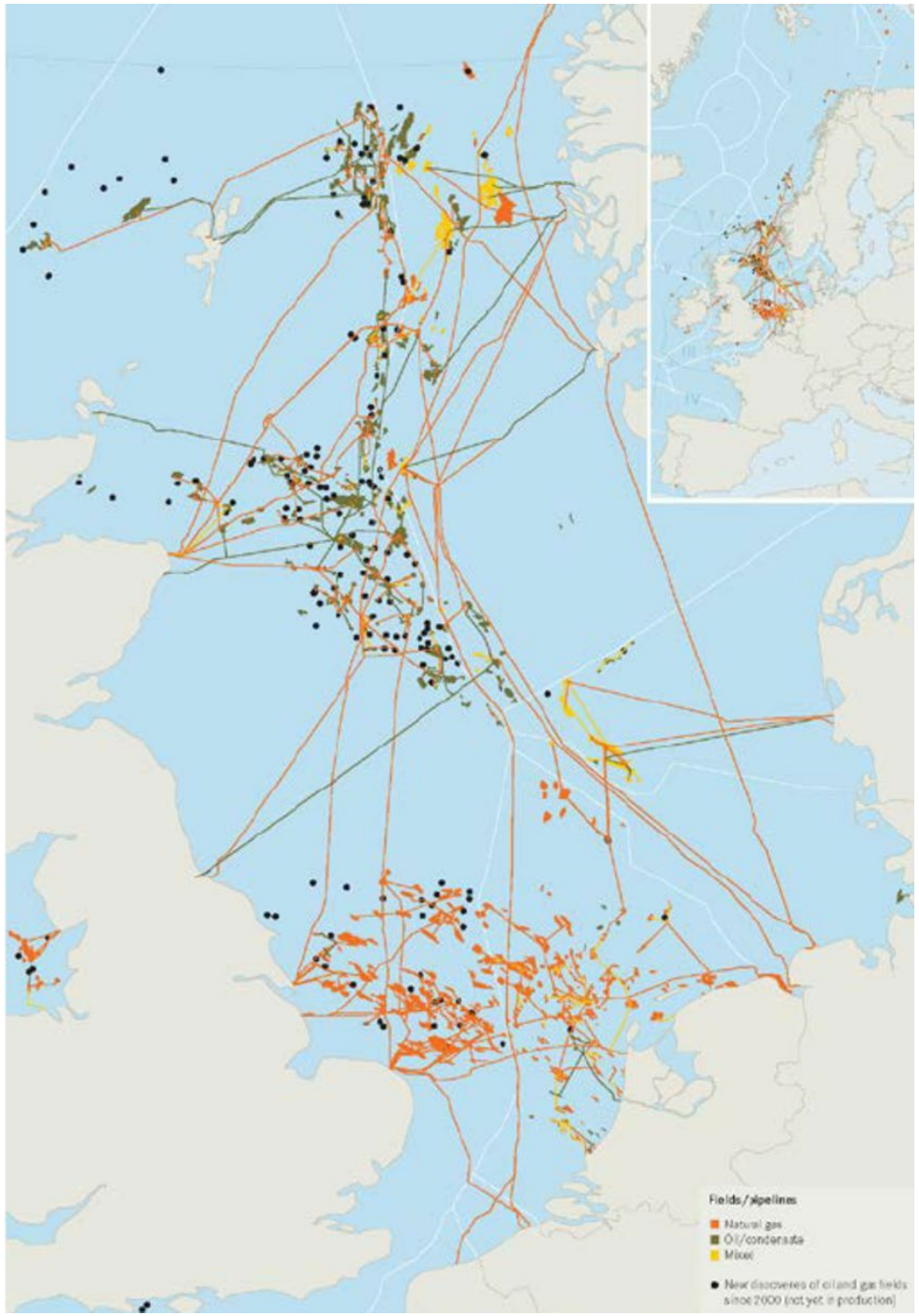
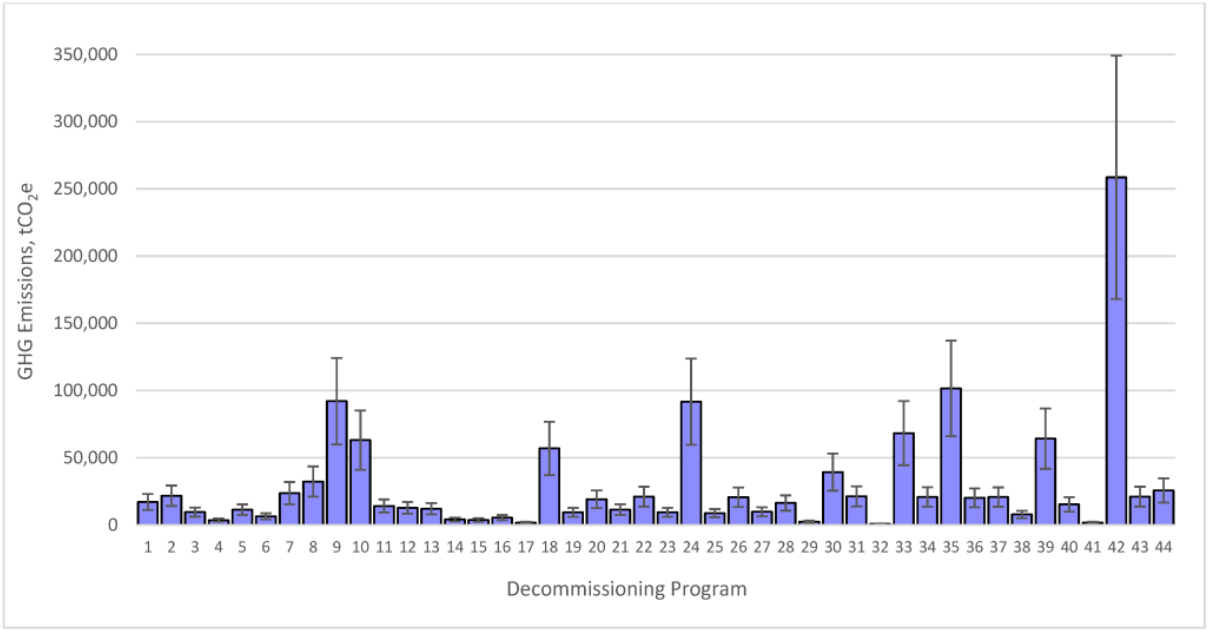
Introduction

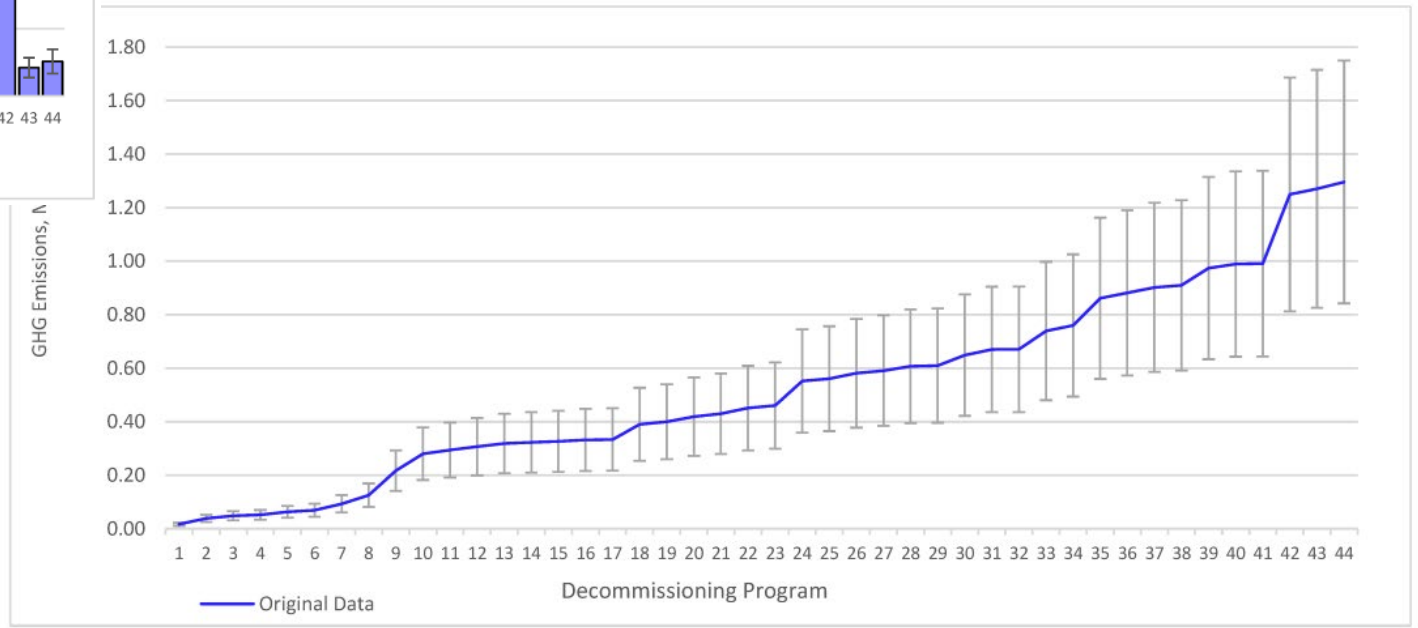
- Current GHG emission calculation methods
- Bringing circularity into decommissioning
- Current GHG emissions from decommissioning
- Future GHG emissions from decommissioning
- Ecosystems and decommissioning
- Transitioning in the Energy System: GHG emissions pathway mapping




Fields/pipelines
Natural gas
Oil/condensate
Mixed
New discoveries of oil and gas fields since 2000 (not yet in production)

UK North Sea decom GHG emissions





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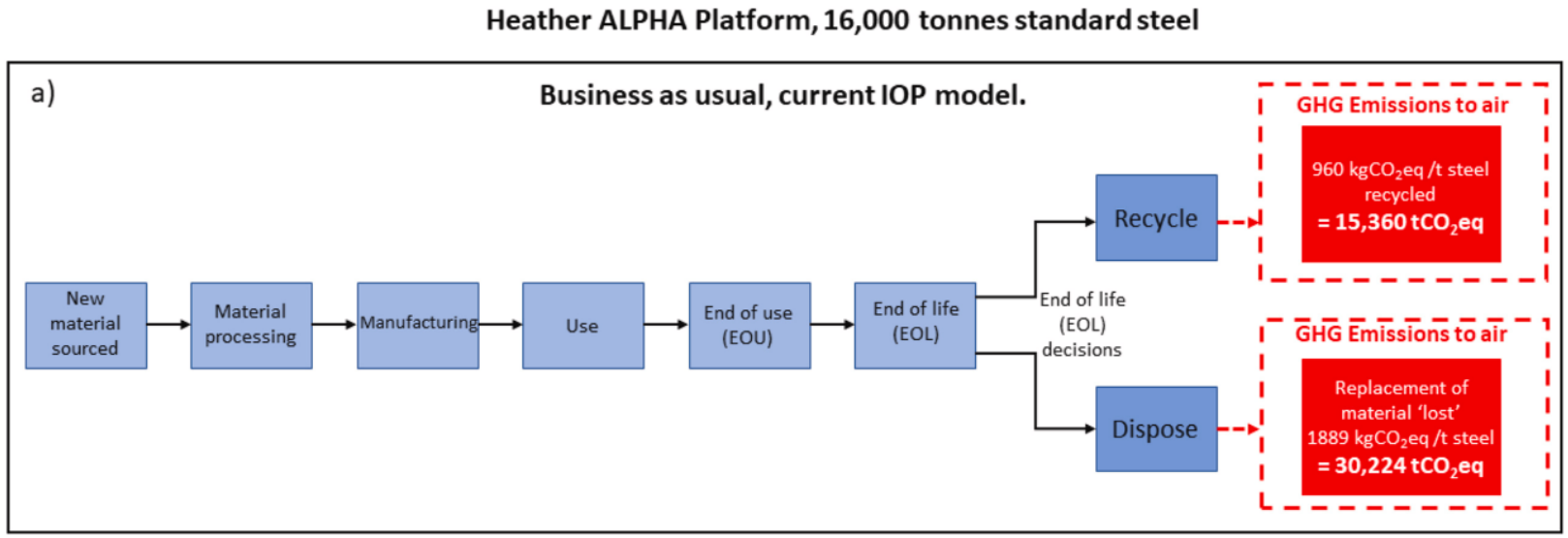
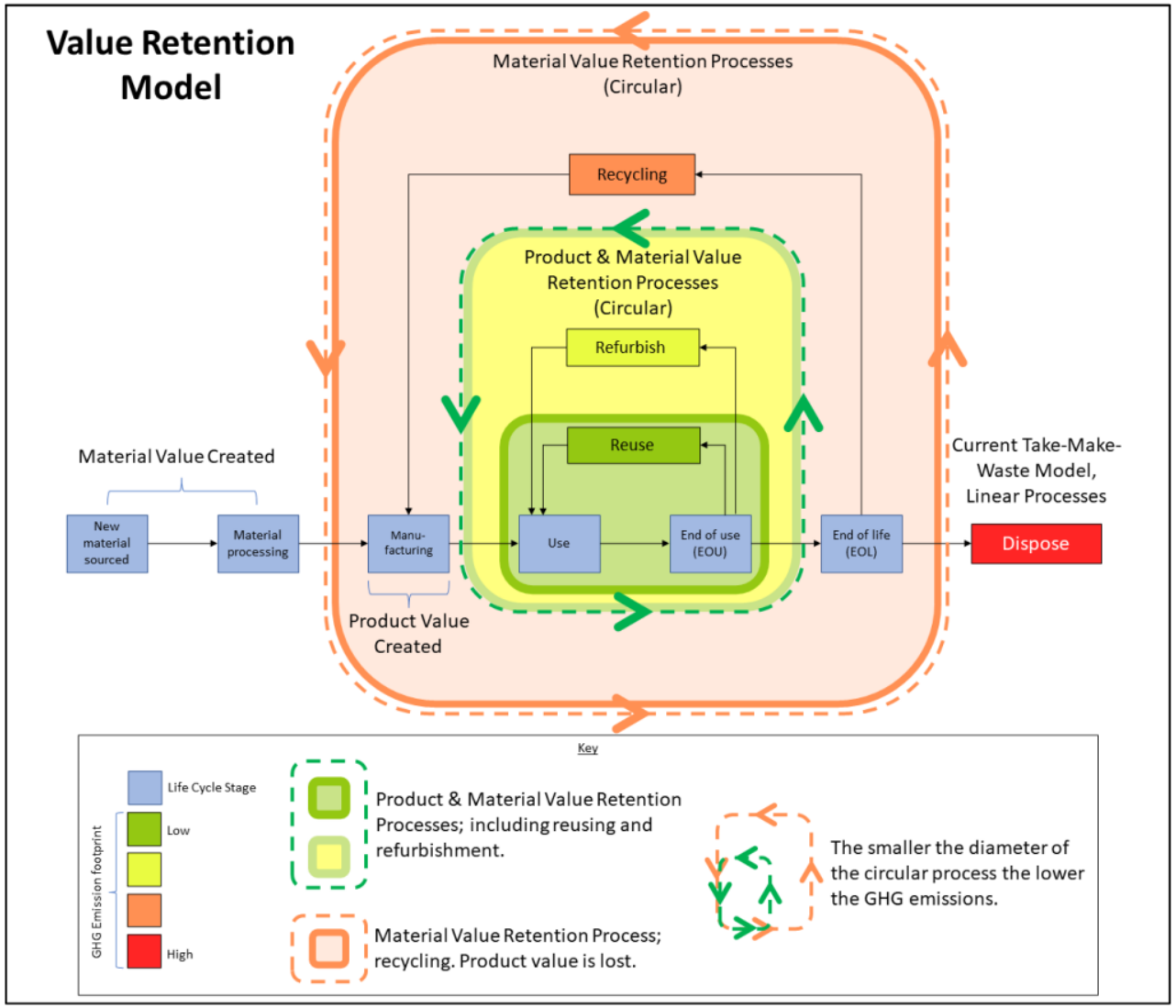
Current Decommissioning Model



Abigail J. Davies, Astley Hastings, Quantifying greenhouse gas emissions from decommissioned oil and gas steel structures: Can current policy meet NetZero goals?, Energy Policy, Volume 160, 2022, 112717, ISSN 0301-4215, https://doi.org/10.1016/j.enpol.2021.112717.

New Decommissioning Model



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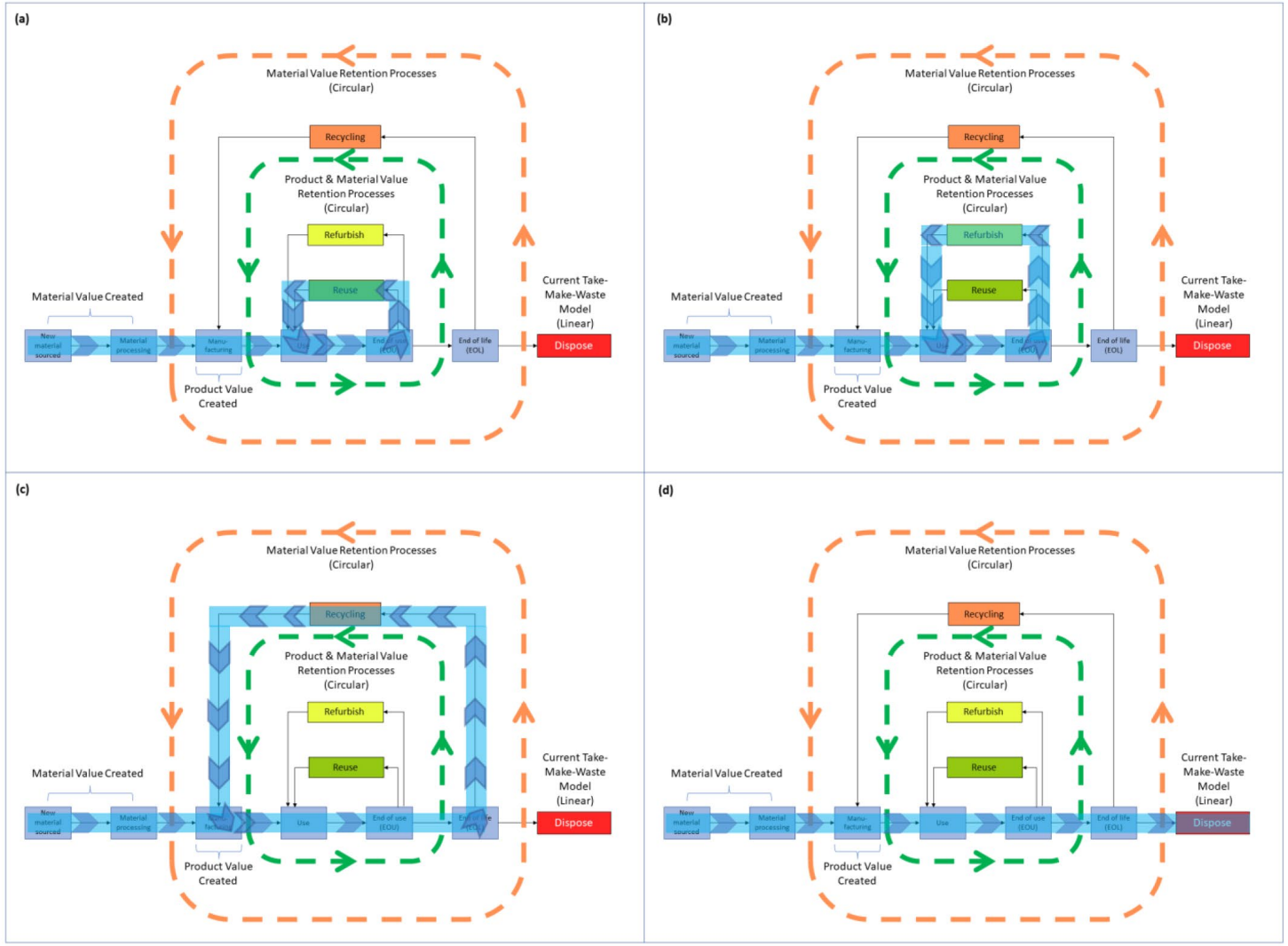
End of life material pathways



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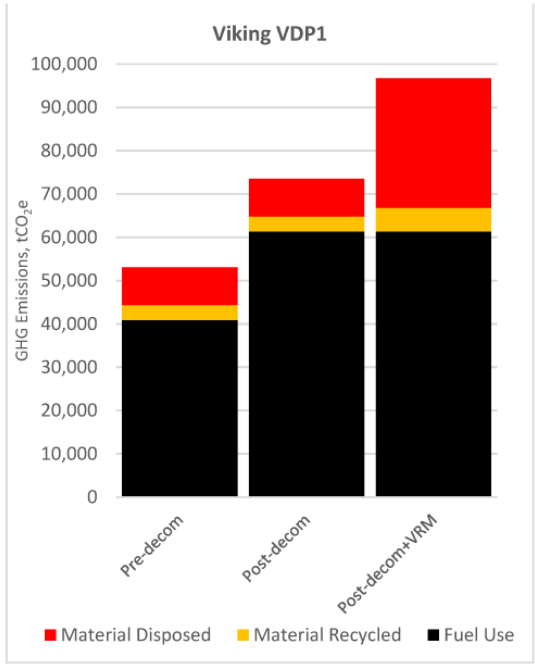

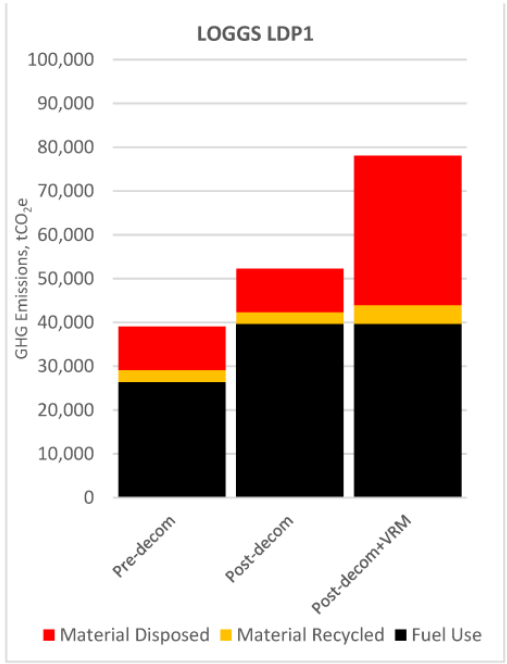

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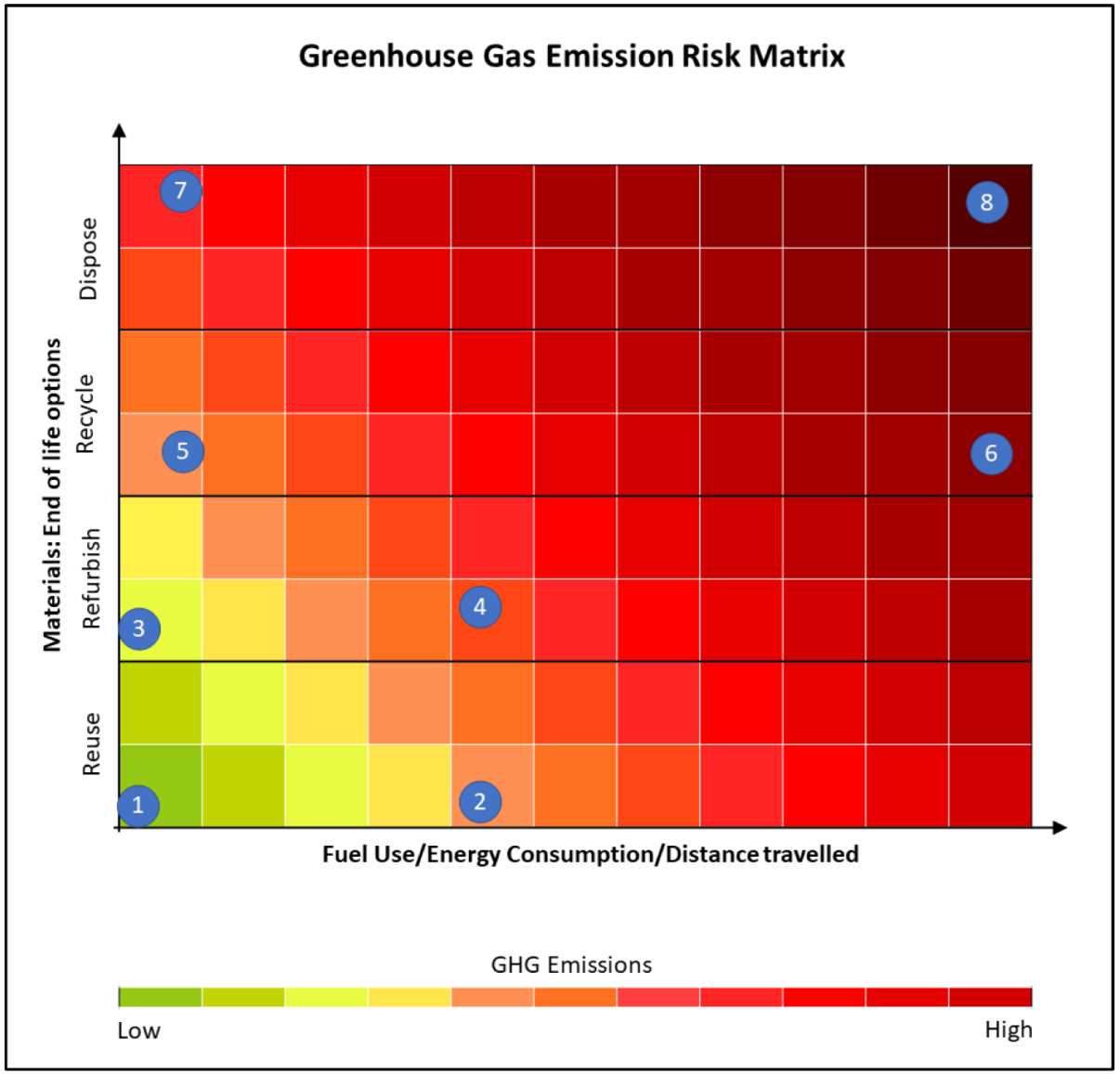

1. Leave in situ for reuse as a reef.
2. Move to a different location for reuse.
3. Refurbish, in situ, for alternative use such as renewables.
4. Refurbished but moved location
5. Recycle in the UK.
6. Recycle abroad.
7. Dispose in the UK.
8. Dispose abroad.

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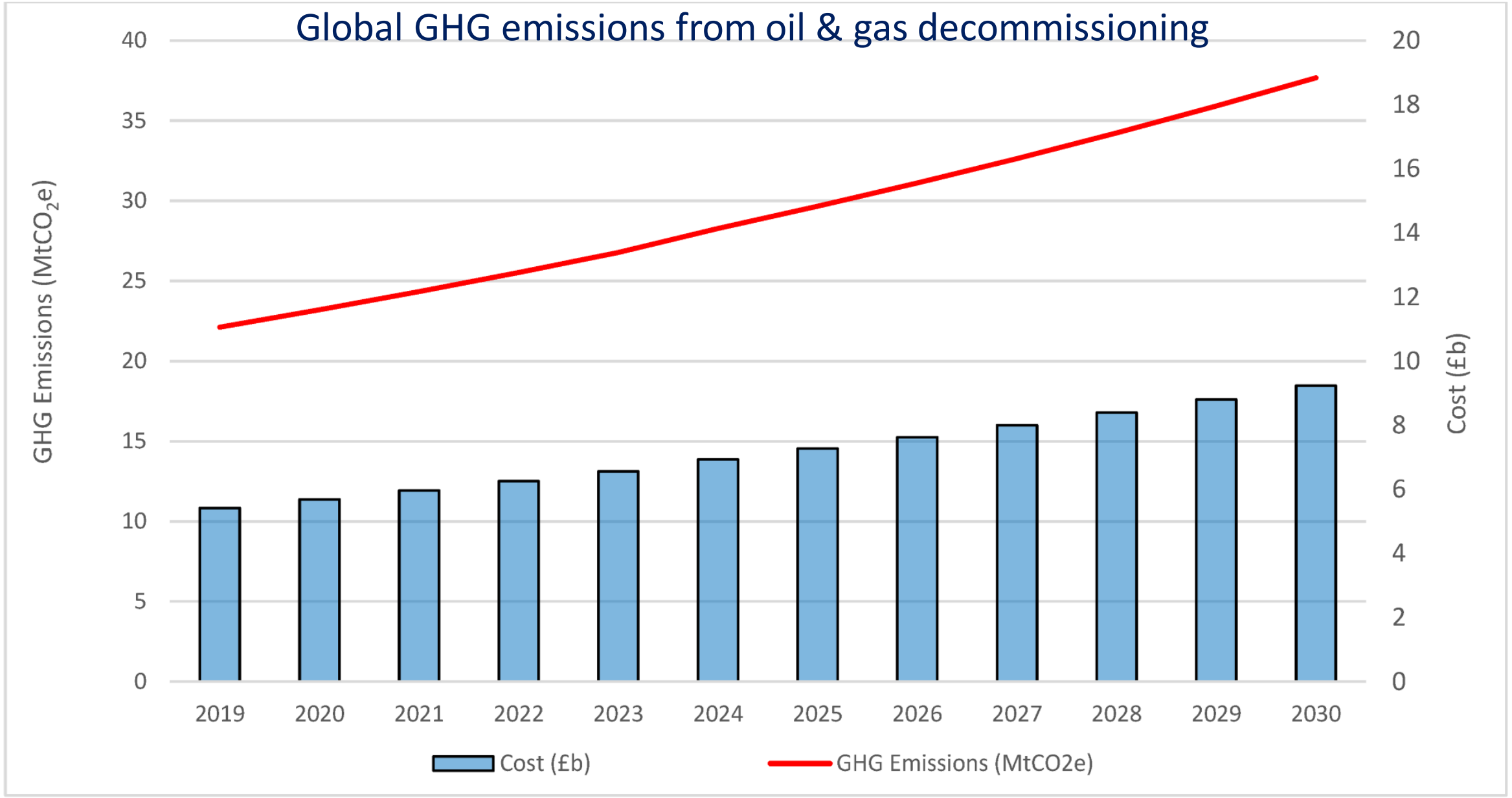
Future Offshore Energy Growth



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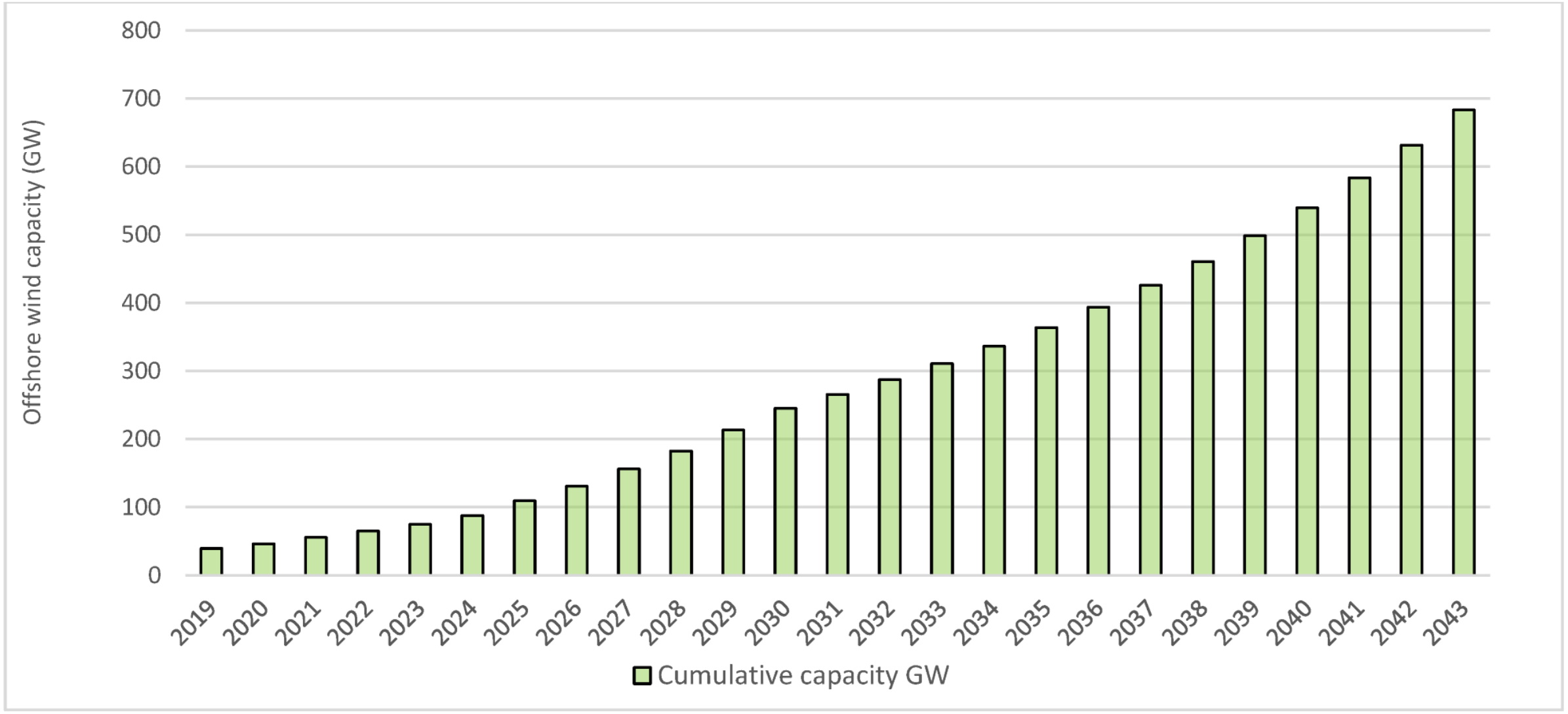
Offshore global wind capacity



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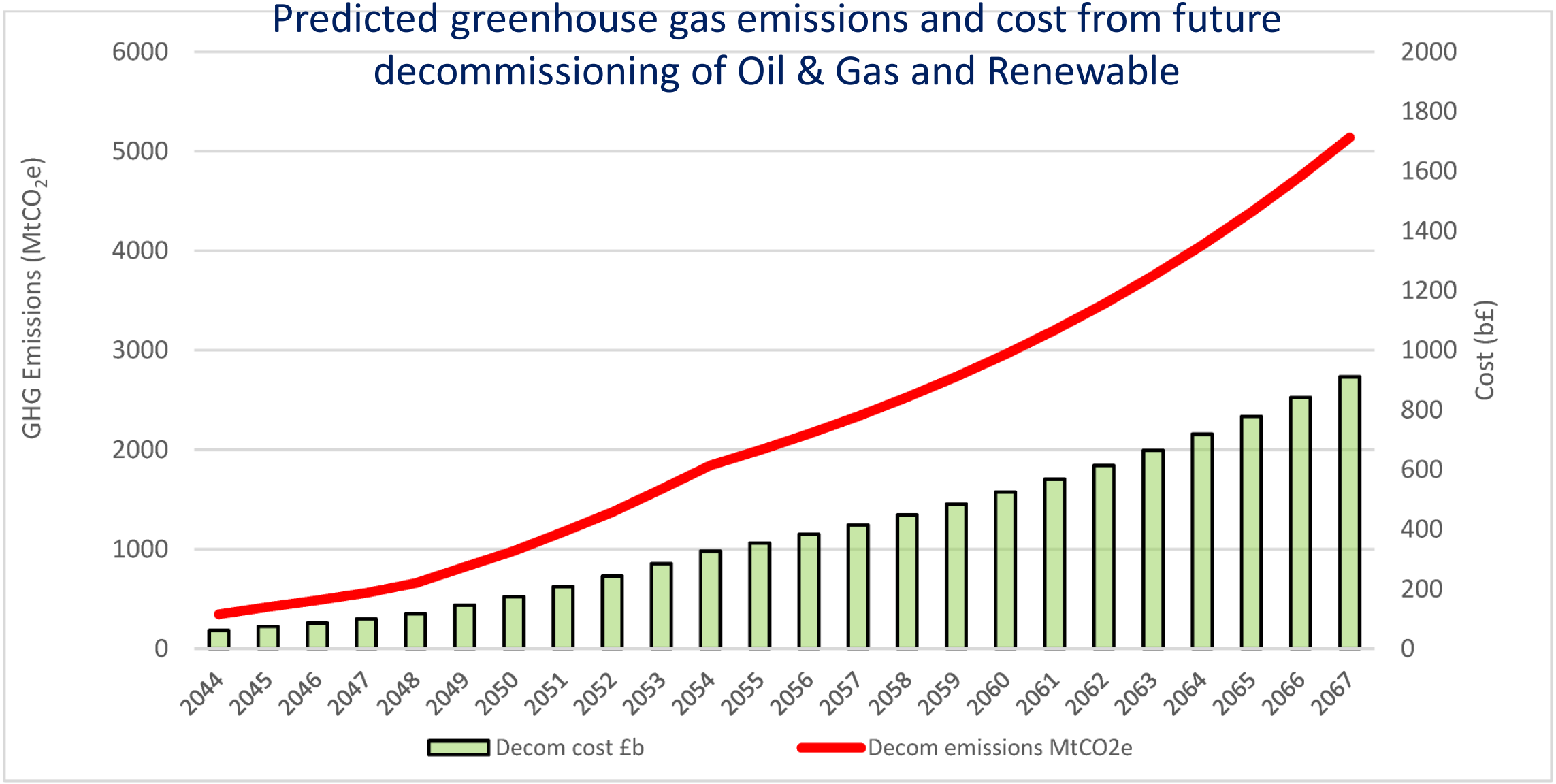
Predicted greenhouse gas emissions and cost from future decommissioning of Oil & Gas and Renewable



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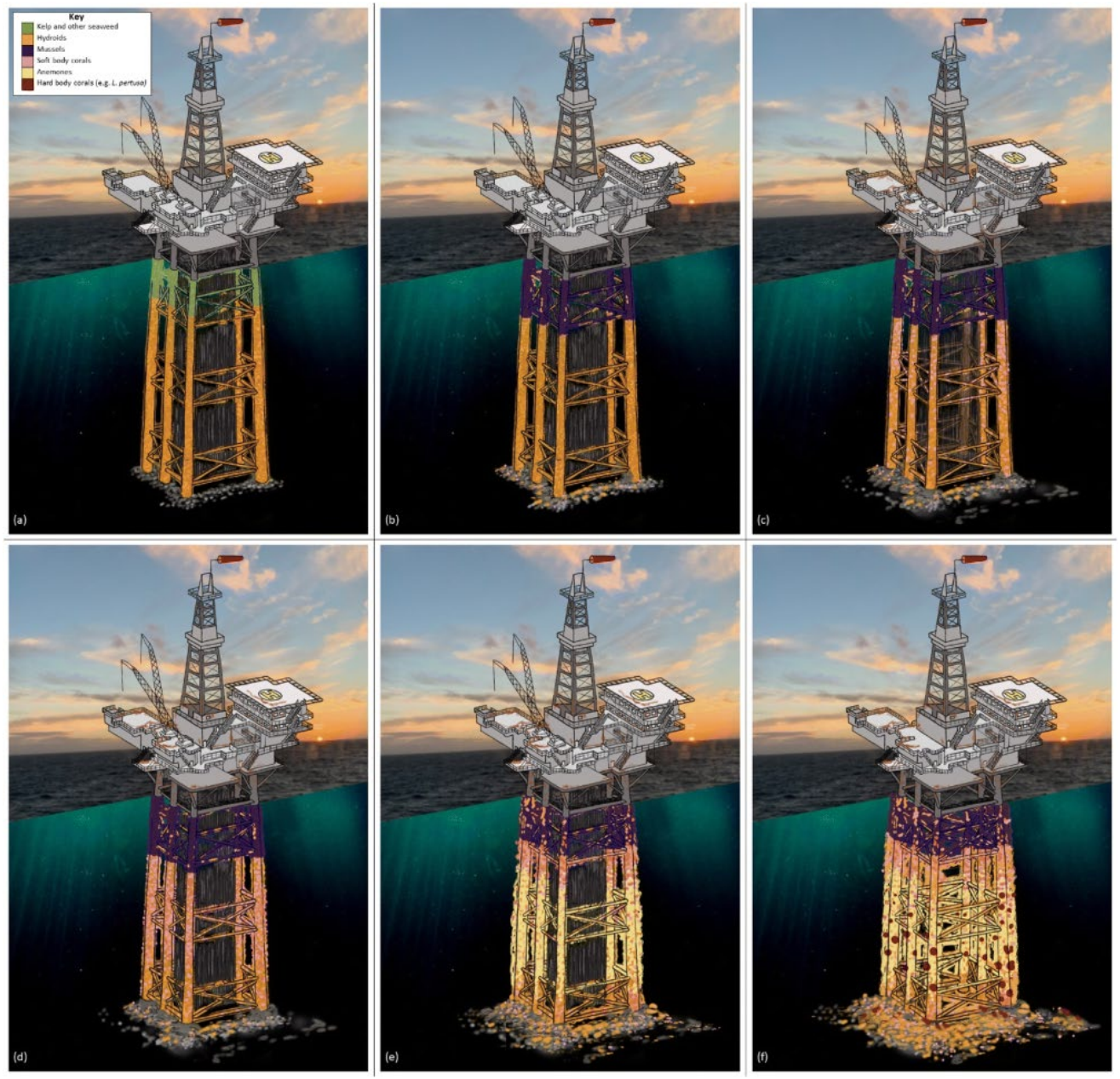
Ecosystems and oil & gas infrastructures



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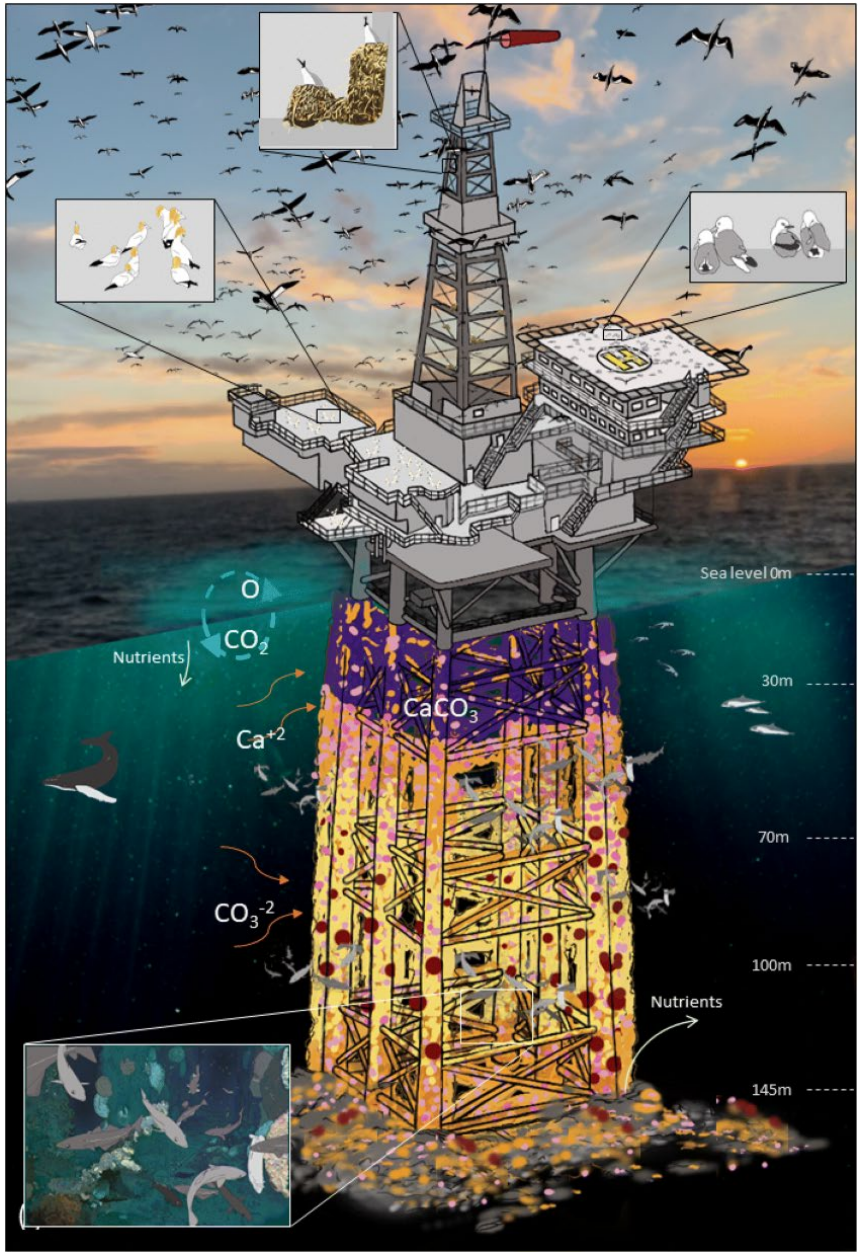

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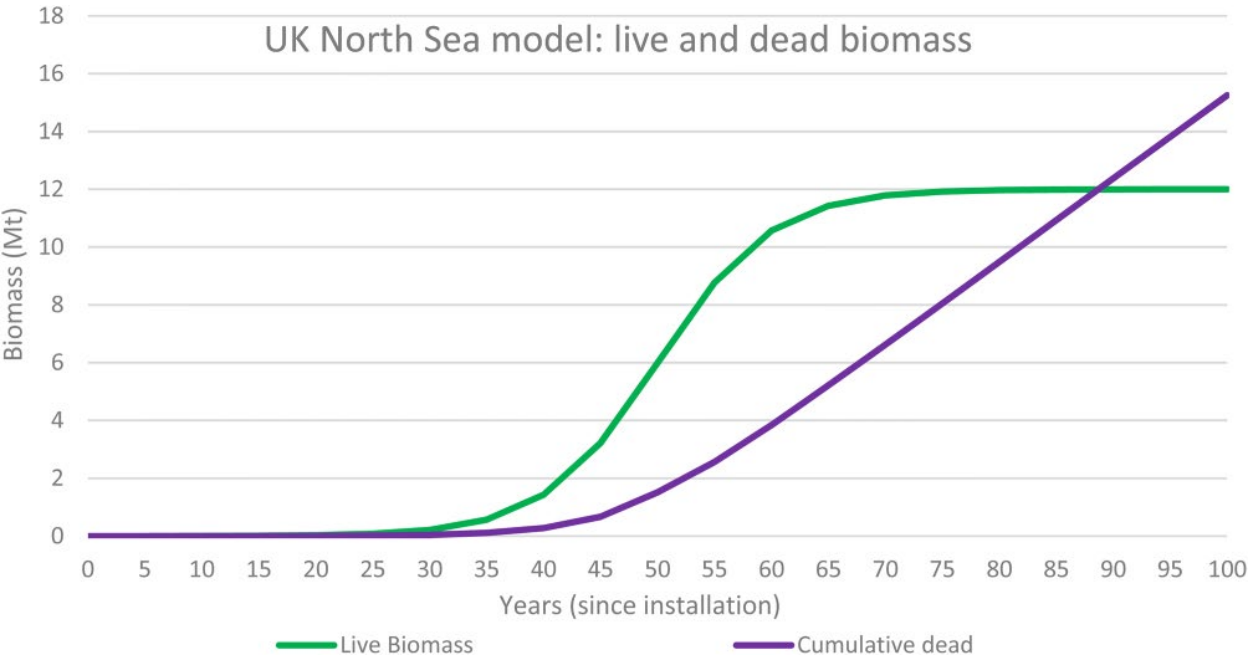

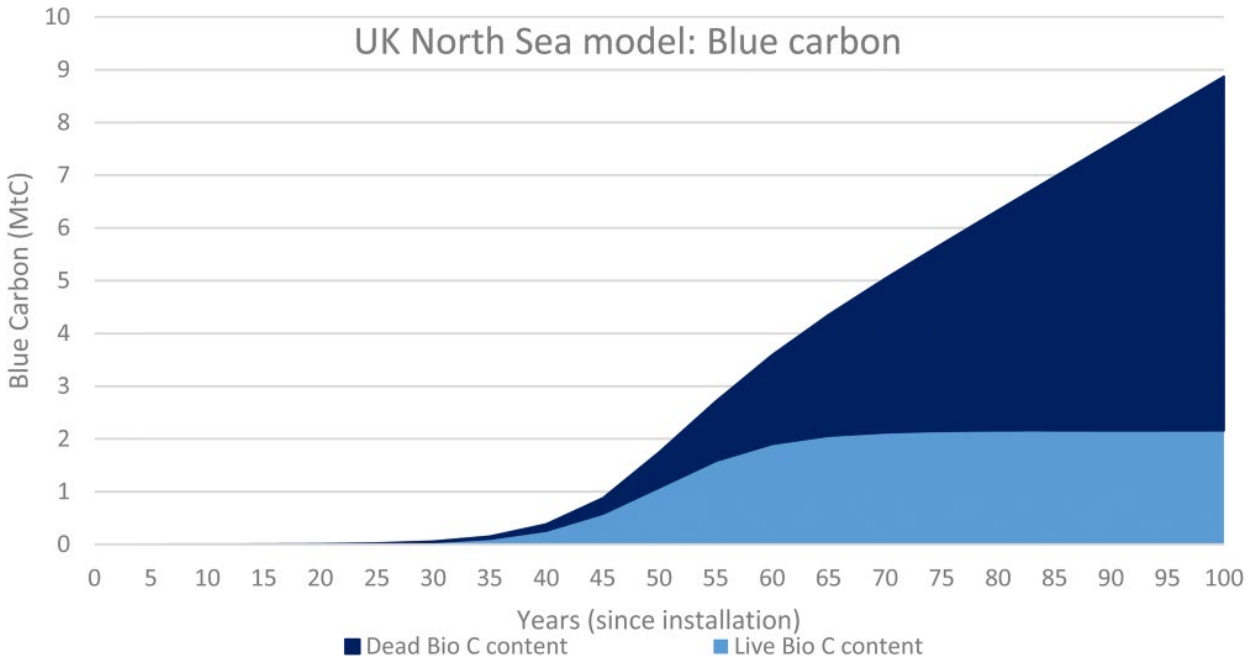

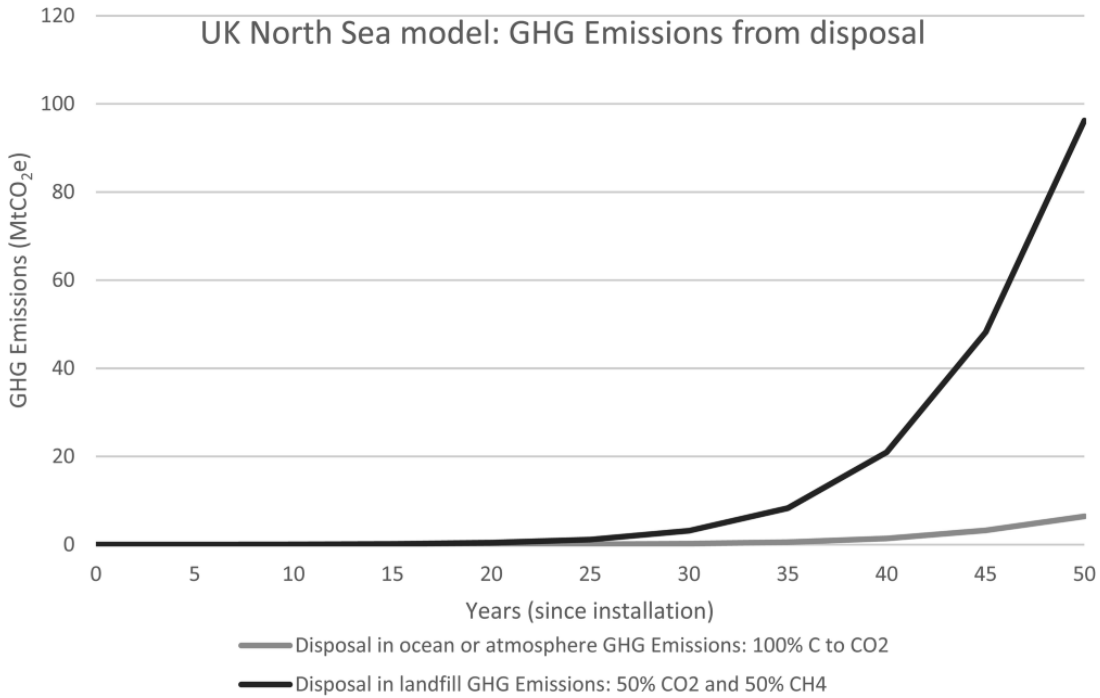

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Estimates for current Blue Carbon

UK North Sea	1.75 MtC
Global	64 MtC
GHG Emissions if disposed in landfill, UK	96 $MtCO_2e$
GHG Emissions if disposed in landfill, Global	2,730 $MtCO_2e$

BC forward model; 100 years after installation

UK North Sea	27 MtC
Global	264 MtC
GHG emissions for above if disposed of in landfill up	472 -14,241 $MtCO_2e$

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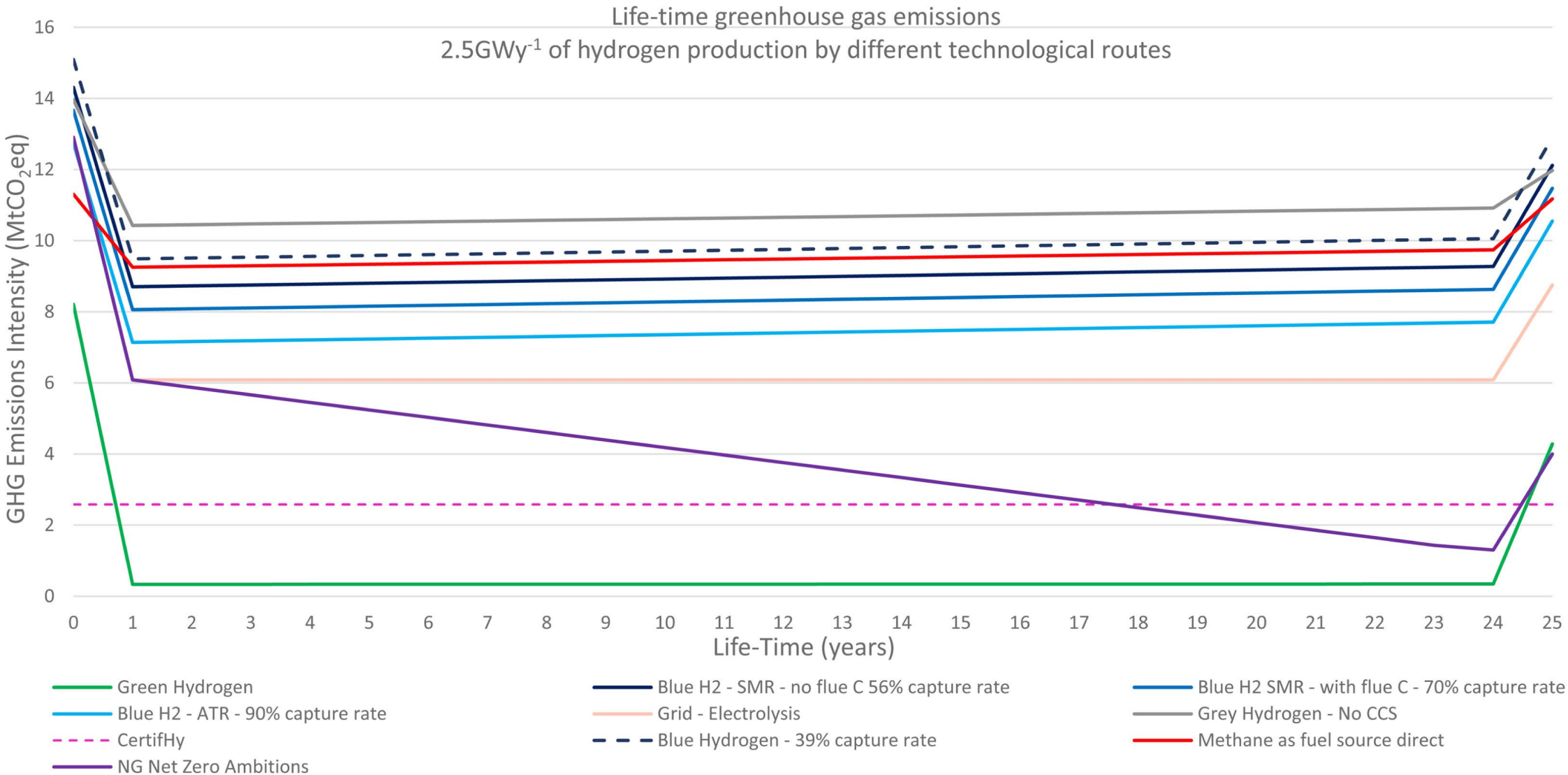
Reuse

Mapping GHG emissions for possible reuse pathways



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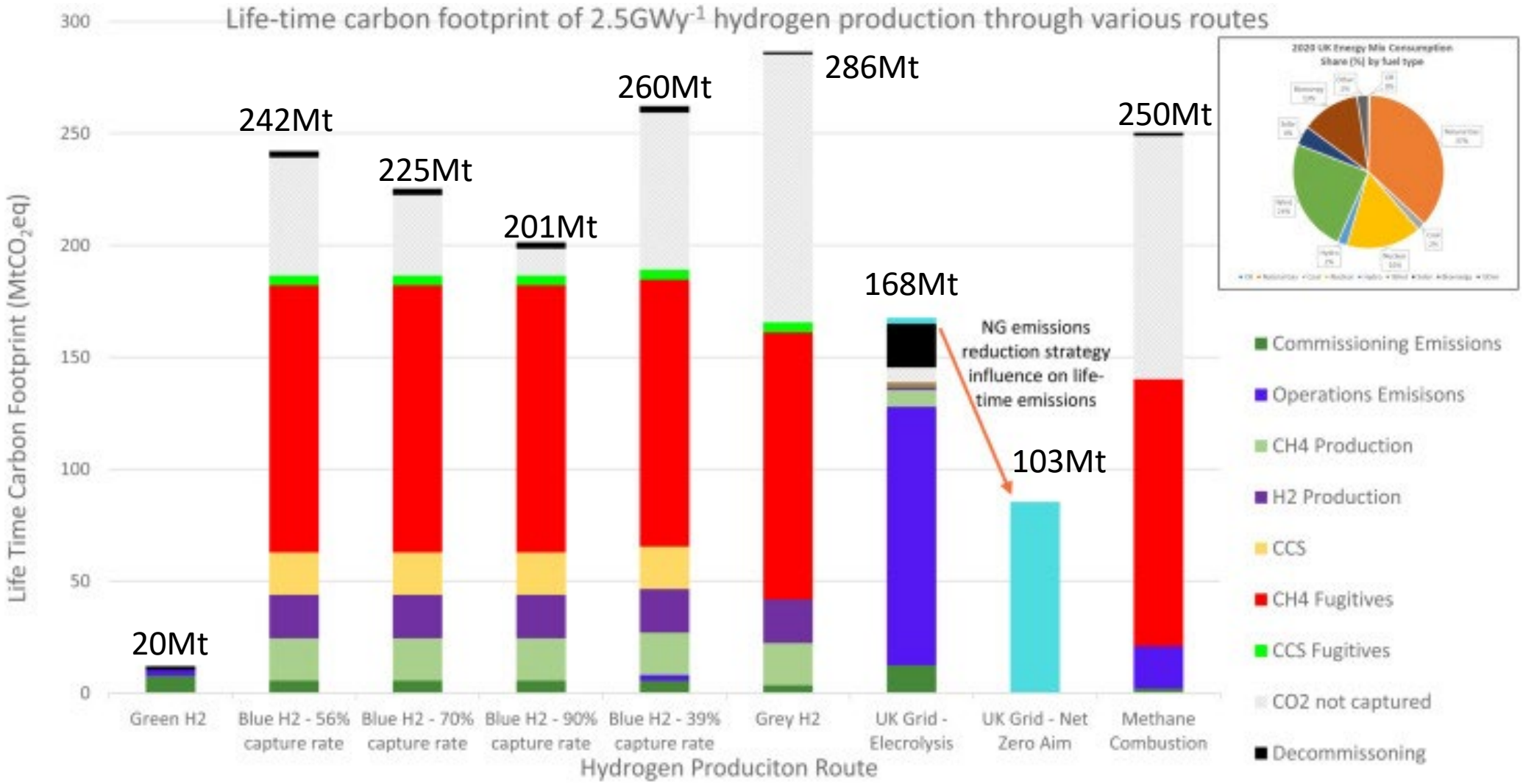

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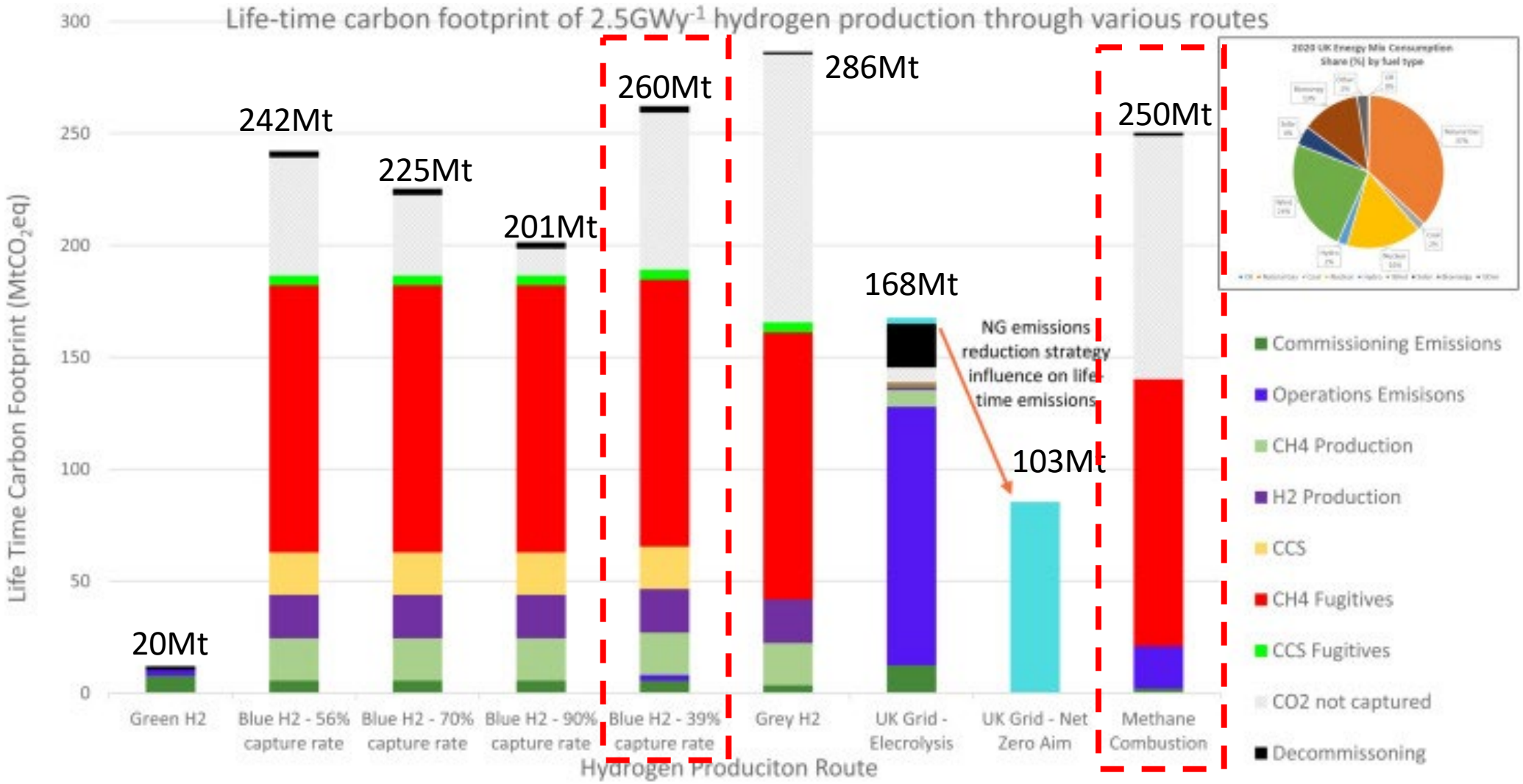

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Thank you

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