



High-Temperature Heat Pumps for Industrial Use – Benchmarking Refrigerants and Efficiency Limits



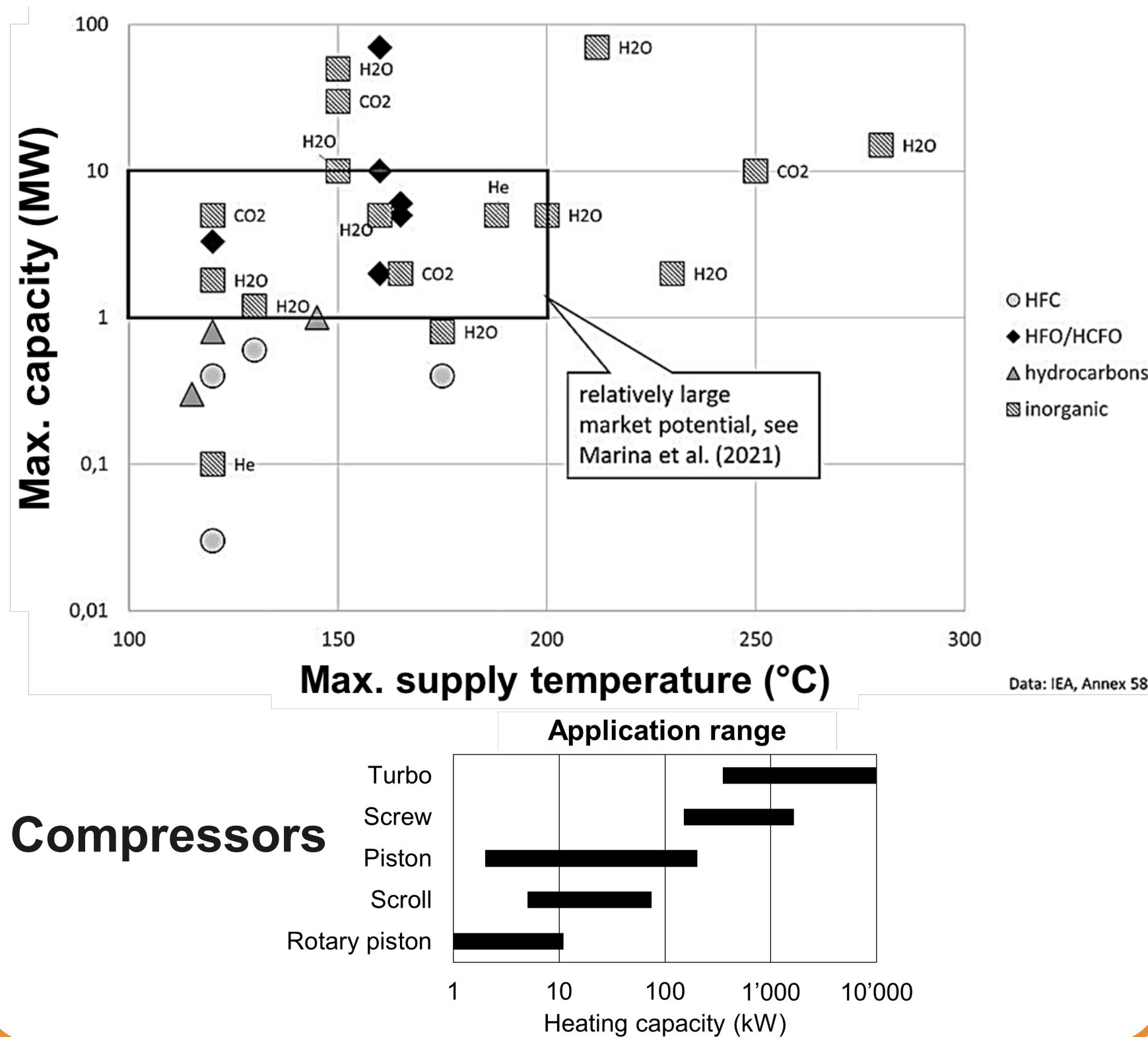
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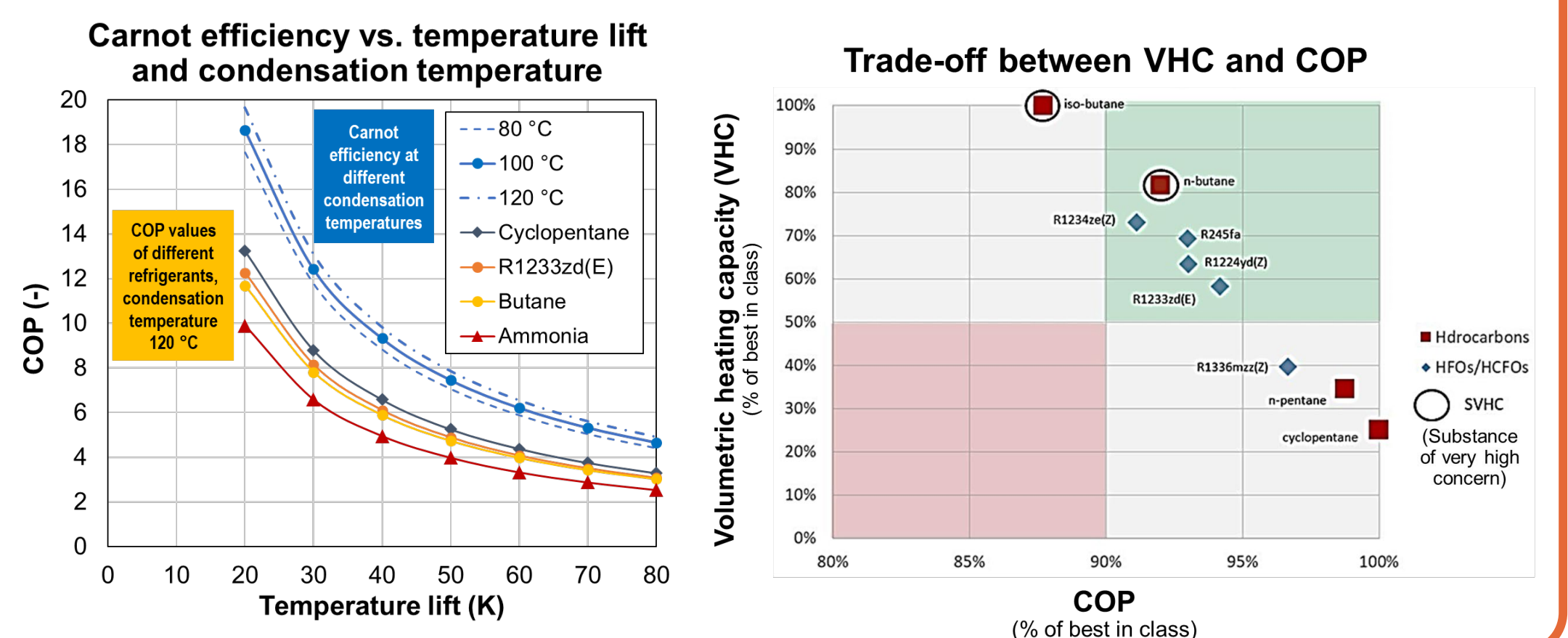
Introduction

- HTHP technology is emerging to generate hot water and steam in industry
- HTHPs require a heat source like waste heat from production processes
- The electricity demand increases with higher temperature lift from heat source to sink

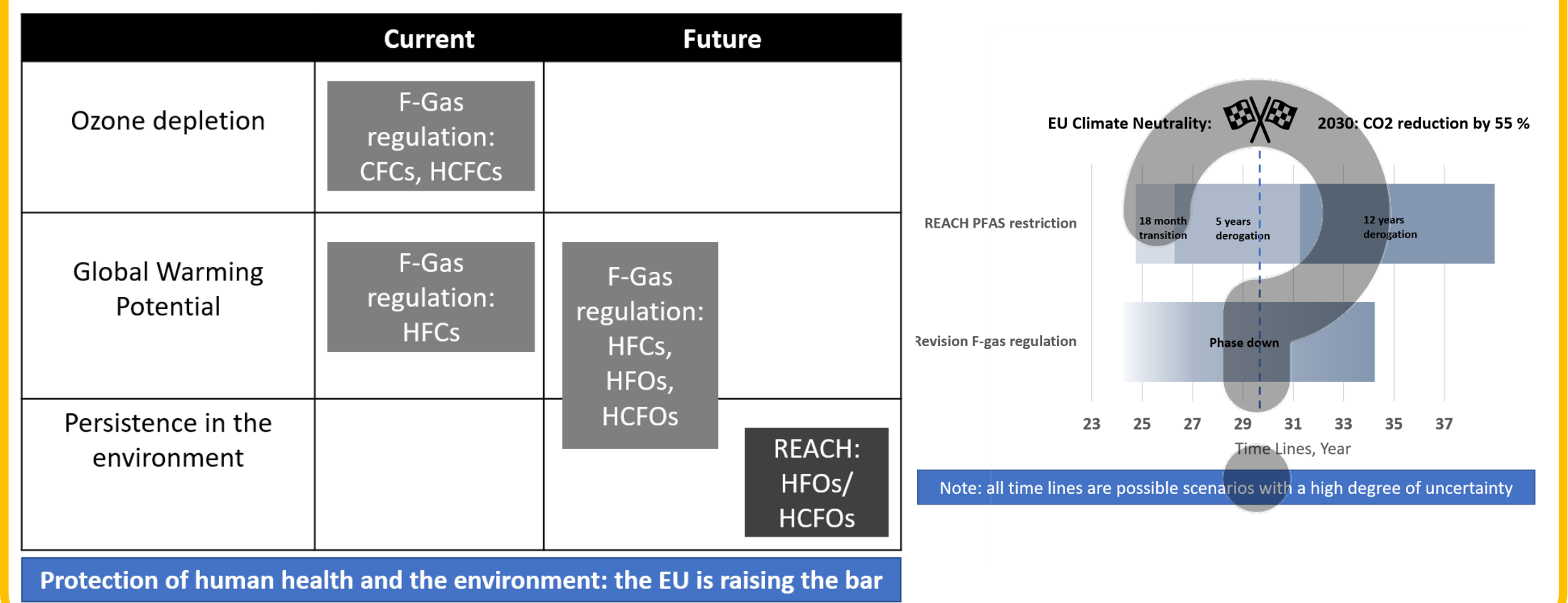
HTHP Availability



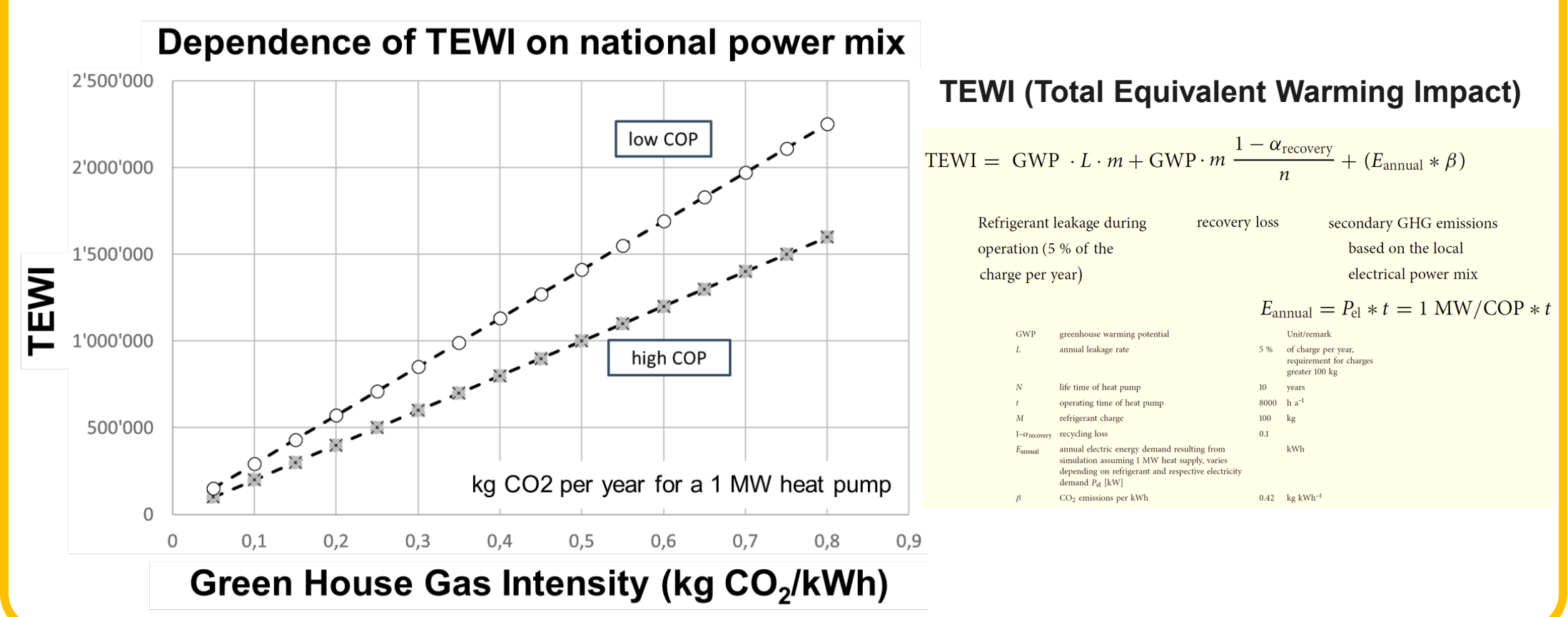
Refrigerants Benchmarking



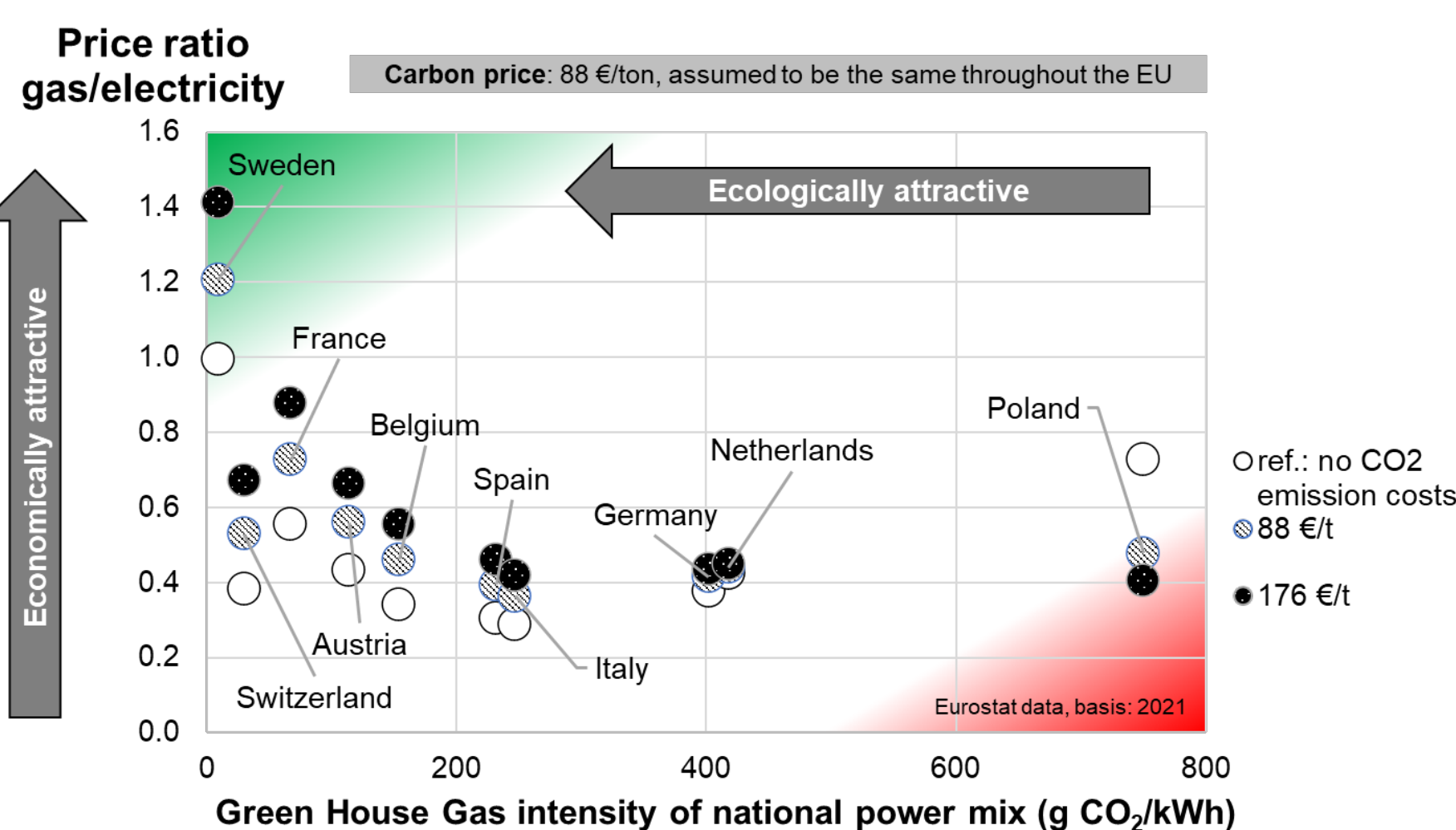
Regulation of F-gases



Environmental Impact



Market Attractiveness



Conclusions

- Decoupling electricity production from greenhouse gas emissions is a prerequisite for making HTHPs successful
- Availability, reliability, and competitiveness of renewable electricity will be key

Acknowledgements

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