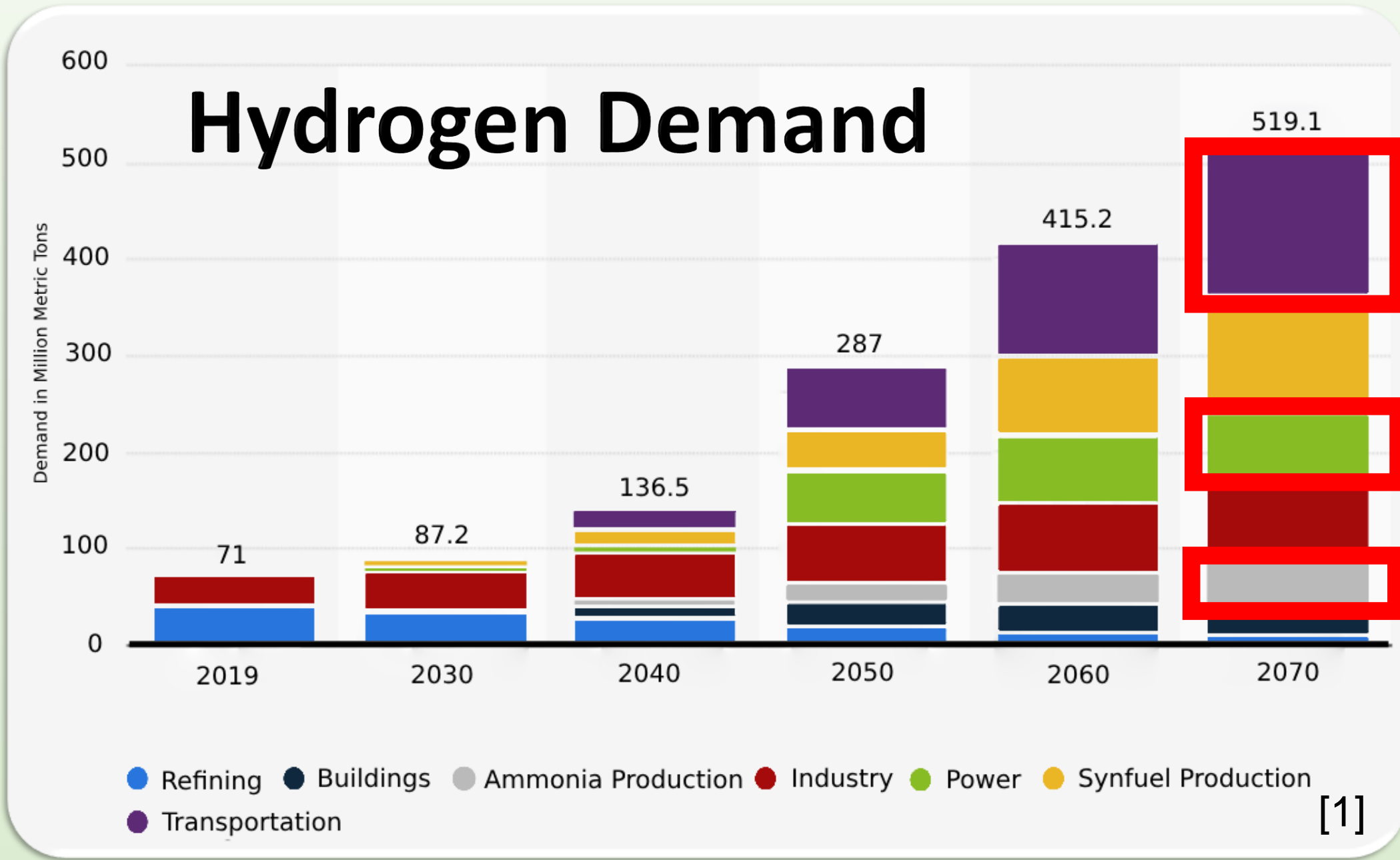


Nicholas Wilson

Supervisors: Jay Wadhawan, Dr. Nathan Lawrence, Ben Dove (Centrica Energy Storage)  
University of Hull & Energy and Environment Institute

## WHY IS HYDROGEN COMPRESSION NEEDED?



**Fuel**

**11,000 L Required to Travel 100 km at Ambient Conditions**

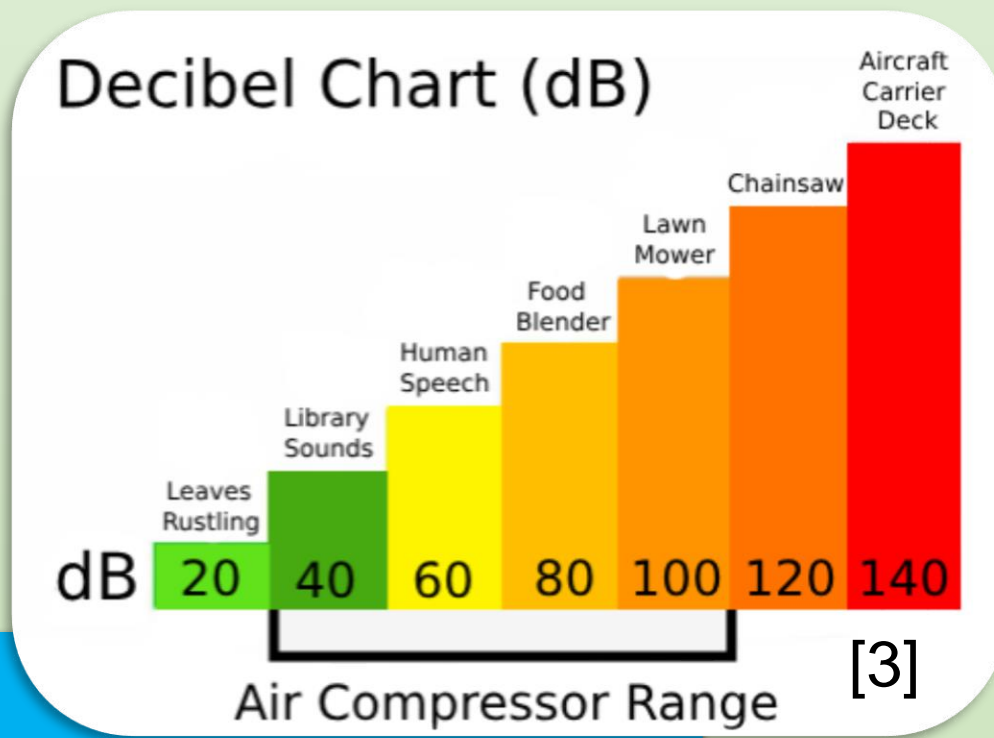
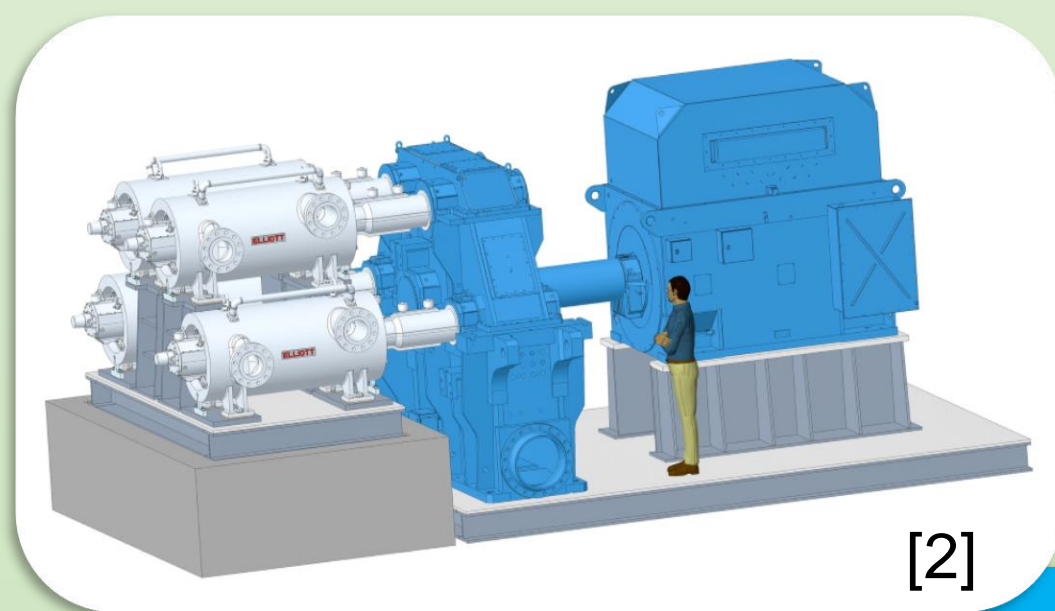
**125 L at 700 X Atmospheric Pressure ≈ 600 km**

## Energy Storage – Gas Fields

**Approx. 200 X Ambient Pressure**

## Agriculture – Fertiliser

**Up to 400 X Ambient Pressure to Create**



**Equipment Size – More Expensive and Unaesthetic**

**Noise Pollution – Moving Parts**

**Current Technology Issues**

**Maintenance – Lack of Durability**

**Low Compression Ratios (1:4)**

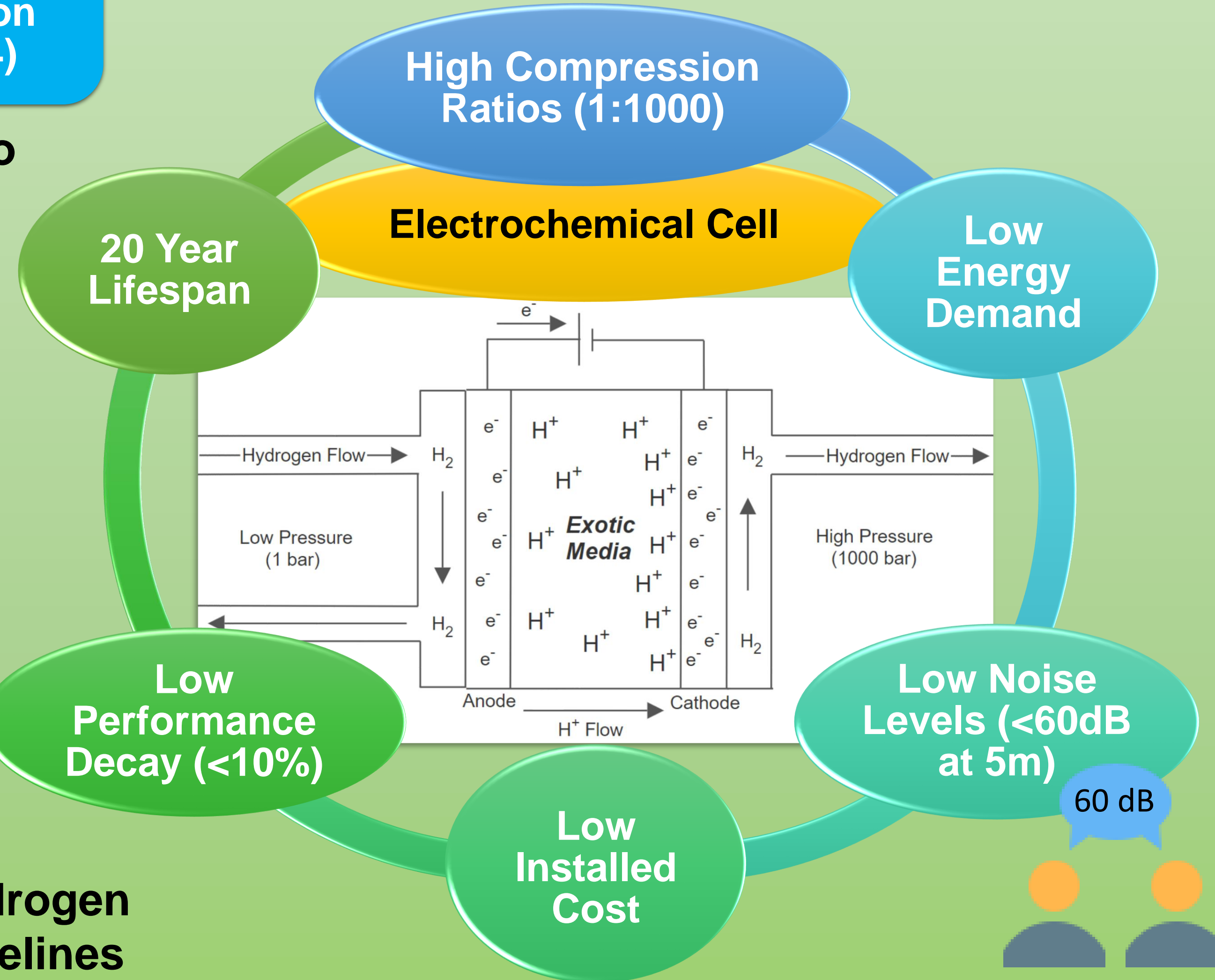
**Offshore Wind Applications**

**Energy to Gas Storage**

**Fuel for Transportation**

**Hydrogen Pipelines**

[4]



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 [1] Aizarani, J. (2023) Forecast hydrogen demand worldwide in a sustainable development scenario from 2019 to 2070, by sector. Statista. Available at: <https://www.statista.com/statistics/760001/global-hydrogen-demand-by-sector-sustainable-scenario/> (Accessed: 27 July 2023).  
 [2] Corporation, E. (2022) 'ELLIOTT DEVELOPS NEW FLEX-OP(R) HYDROGEN COMPRESSION DESIGN', Impeller Net, 14 March. Available at: <https://impeller.net/magazin/elliott-develops-new-flex-opr-hydrogen-compression-design/> (Accessed: 27 July 2023).  
 [3] Sdanghi, G. et al. (2020) 'Towards Non-Mechanical Hybrid Hydrogen Compression for Decentralized Hydrogen Facilities', Energies, 13(12). doi:10.3390/en13123145.