

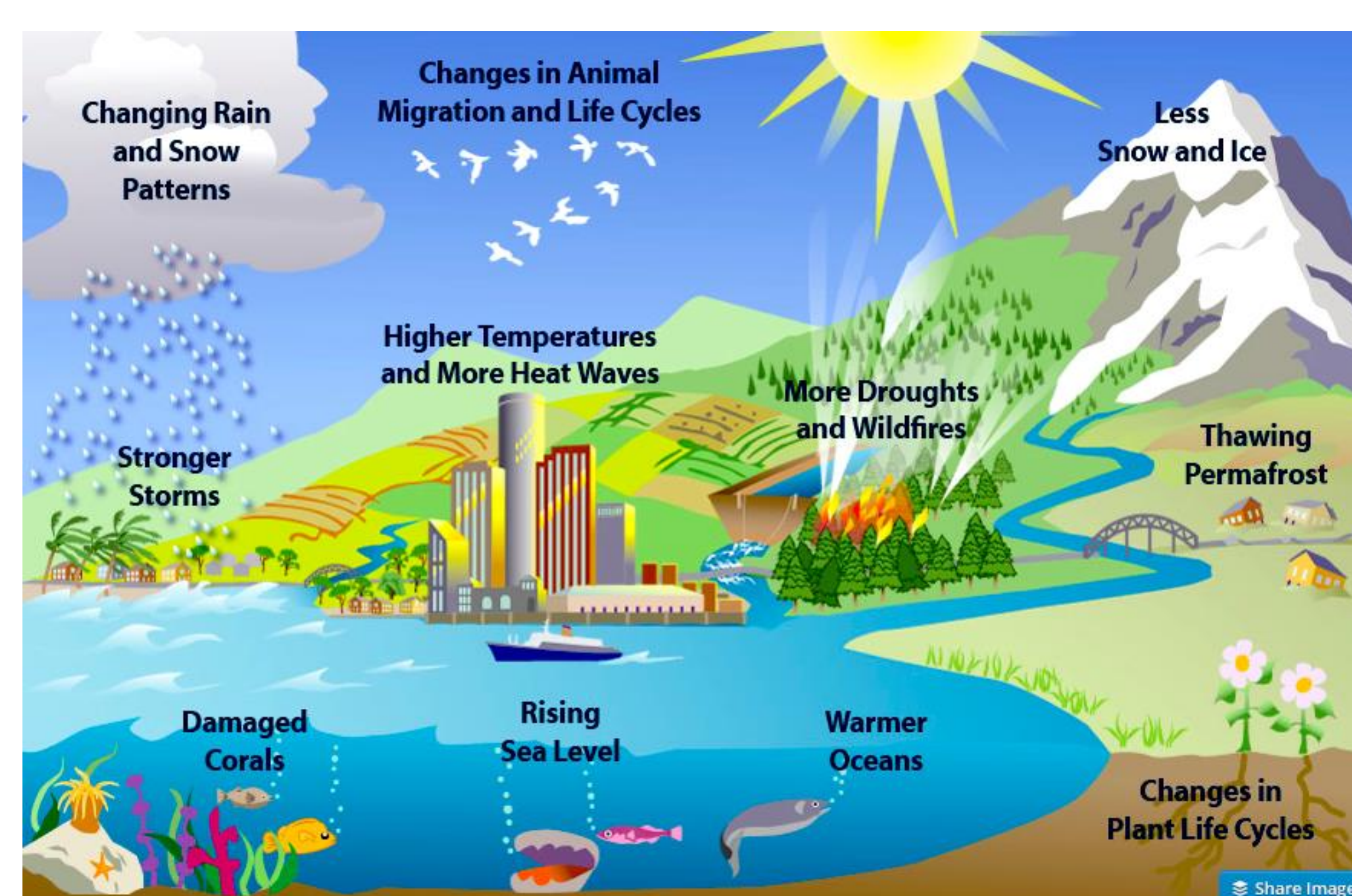
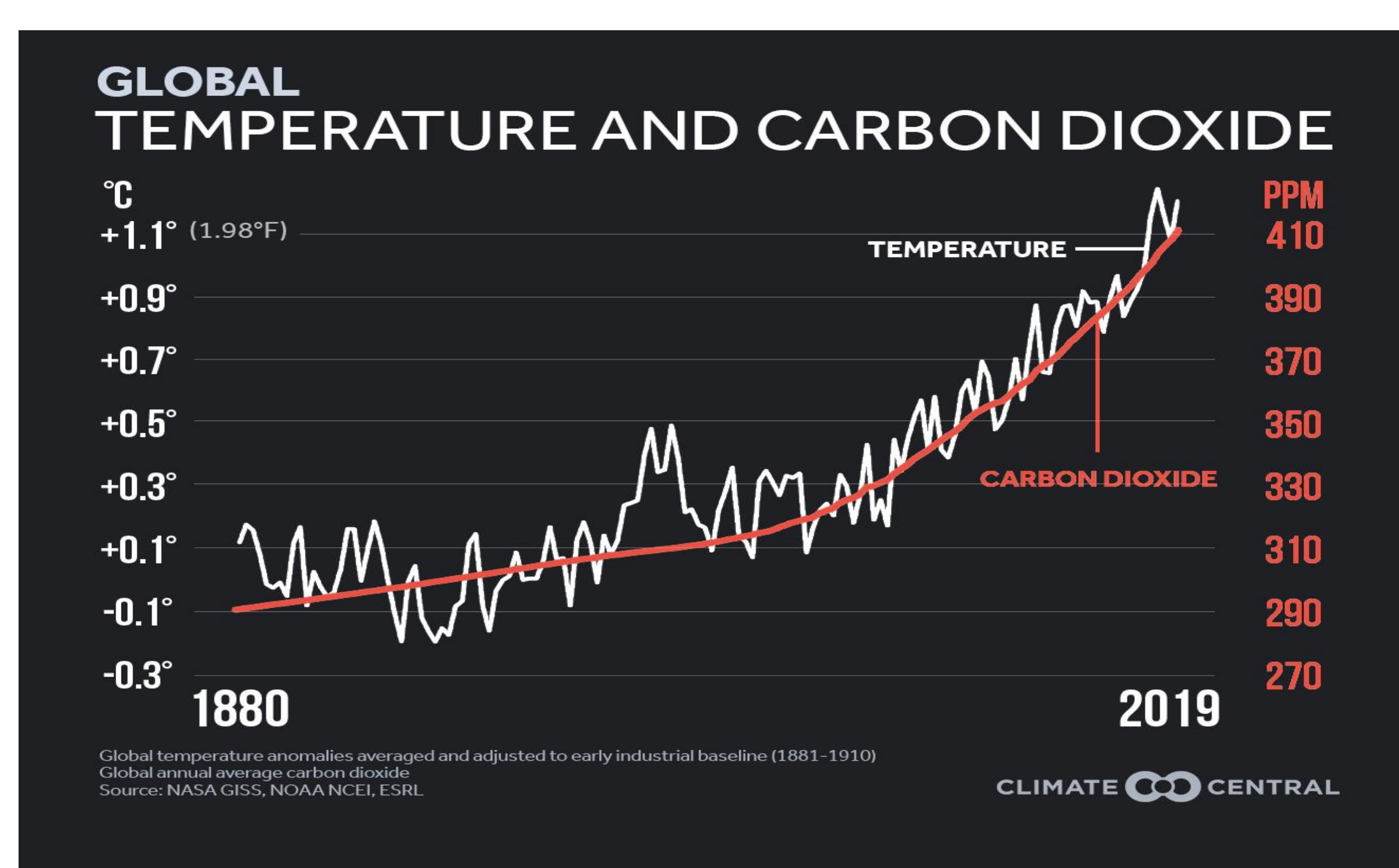


Combining poly(ionic liquid)s and deep eutectic solvents carbons to prepare asymmetric mixed matrix membranes for CO₂ separation

PhD in Chemical Engineering

Bruna Filipa Soares (bruna.soares@tecnico.ulisboa.pt)

Carbon dioxide (CO₂) emissions are the primary driver of global climate change.



Problem

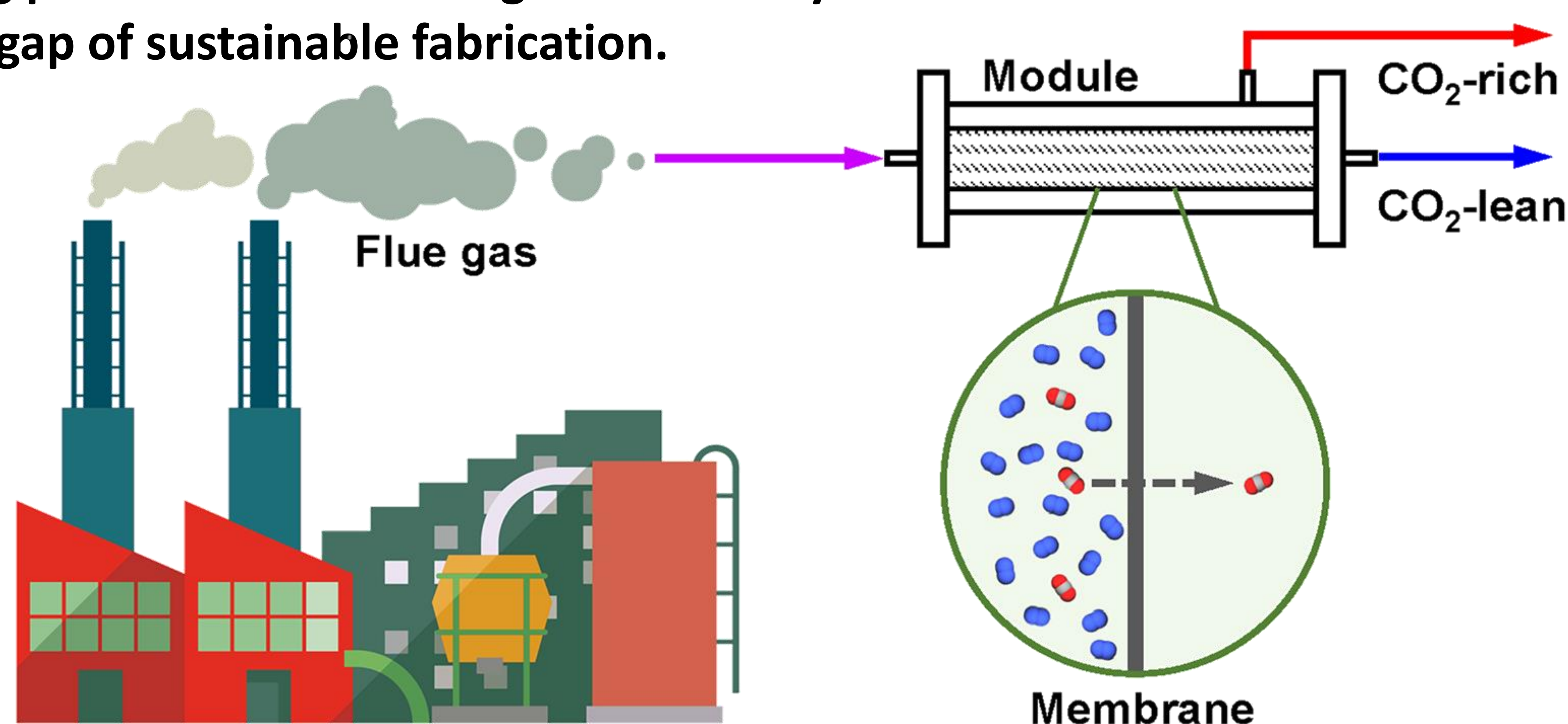
Solution

Consequences

An enormous effort has been put on developing technological solutions to capture and separate CO₂ from stationary sources. Membrane technology is, perhaps, the most promising since it presents undeniable engineering advantages, such as simplicity, reduced environment impact, low energy and operation cost, easy retrofit, integration and scaled-up [1-2].

This work innovates in membrane technology for CO₂ separation by:

- Introducing asymmetric mixed matrix membranes
- Using poly(ionic liquid)s-ionic liquid (PIL-IL)
- Incorporating porous carbons for high CO₂ affinity
- Bridging the gap of sustainable fabrication.



References

- [1] Gouveia, A. S. L., Soares, B. and Marrucho, I. M. Ionic Liquid with Silyl Substituted Cation: Thermophysical and CO₂/N₂ Permeation Properties. Israel Journal of Chemistry 2019, 59, 852–865
[2] Zhang, Y., Xie, Y., Zhu, Y., Lu, X., and Ji, X. Energy consumption analysis for CO₂ separation from gas mixtures with liquid absorbents. Energy Procedia 2014, 61, 2695–2698