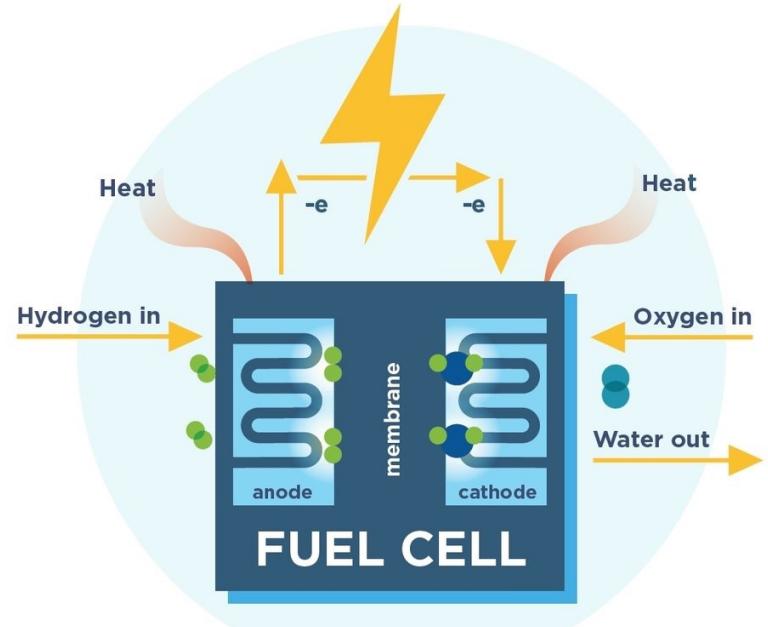


Fuel Cell's Performance Comparing Pure Oxygen, Air, and Number of Membranes

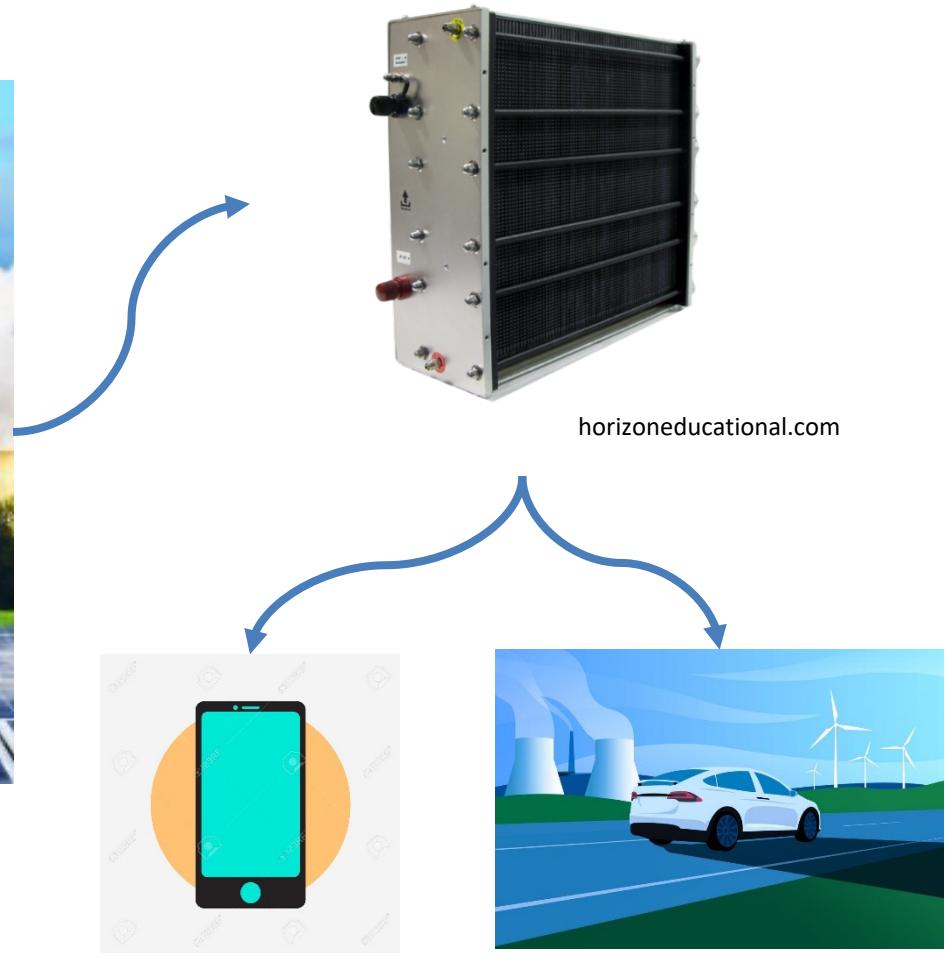
- Pierce Columna
 - Enoch Chang
 - Ashton Tom
 - Quynh Tran
-
- Chemical Engineering
 - University of California, San Diego
-
- February 20, 2024



Fuel cells are now being developed and used for the sake of power generation far more often than before.



csis.org

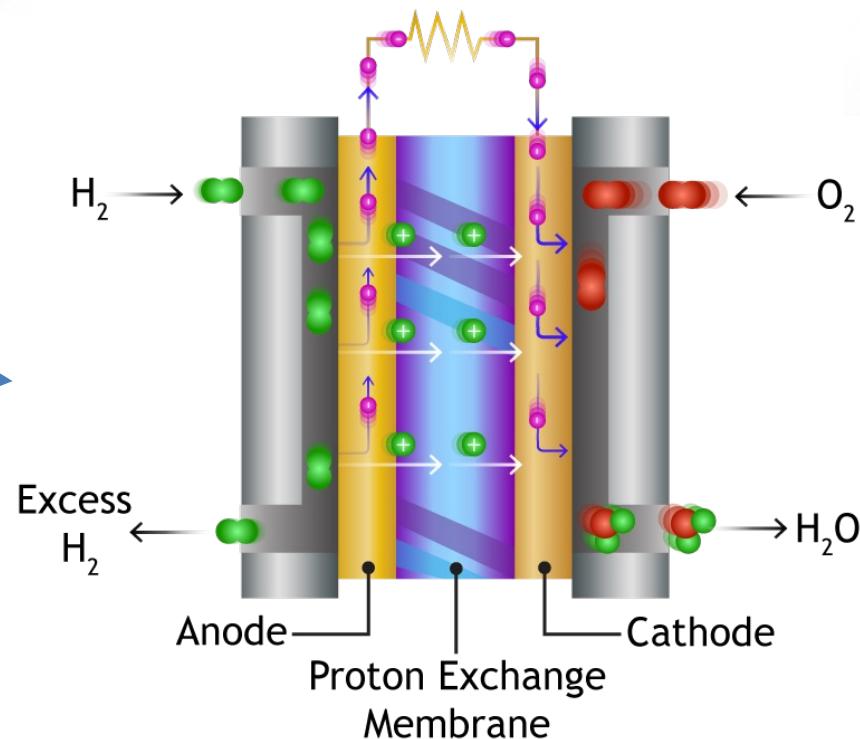
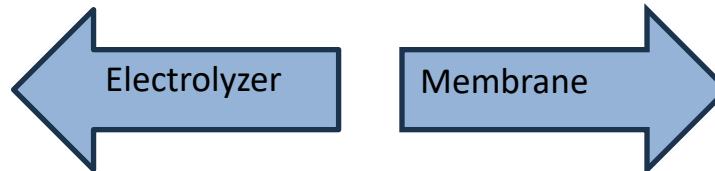


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This presentation focuses on the proton-exchange membrane fuel cell and its different sources of energy

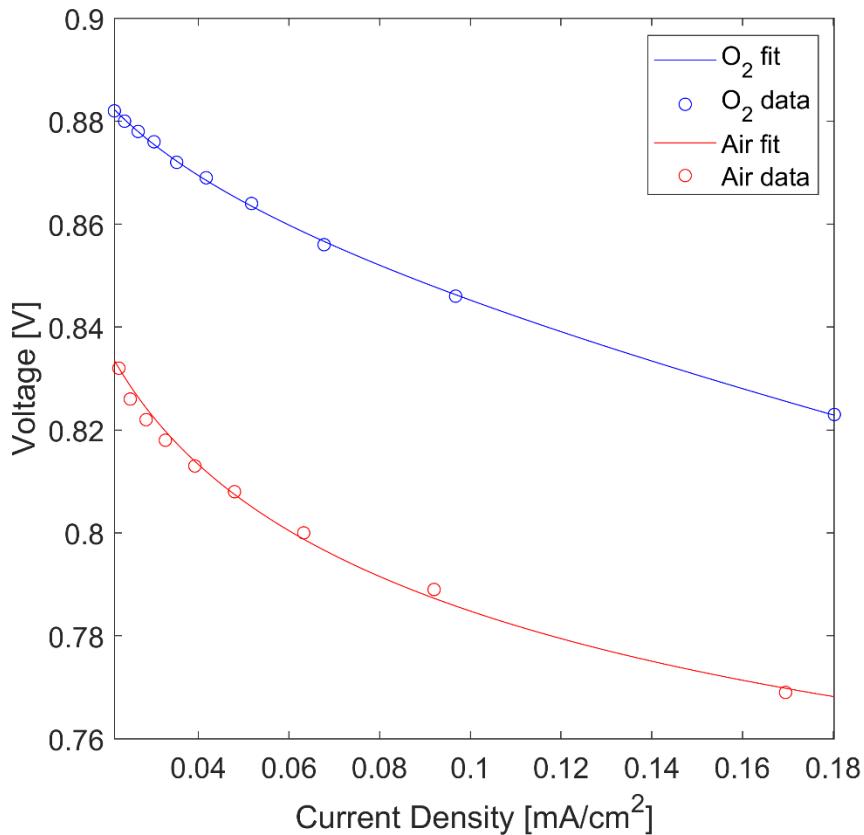


web.stanford.edu

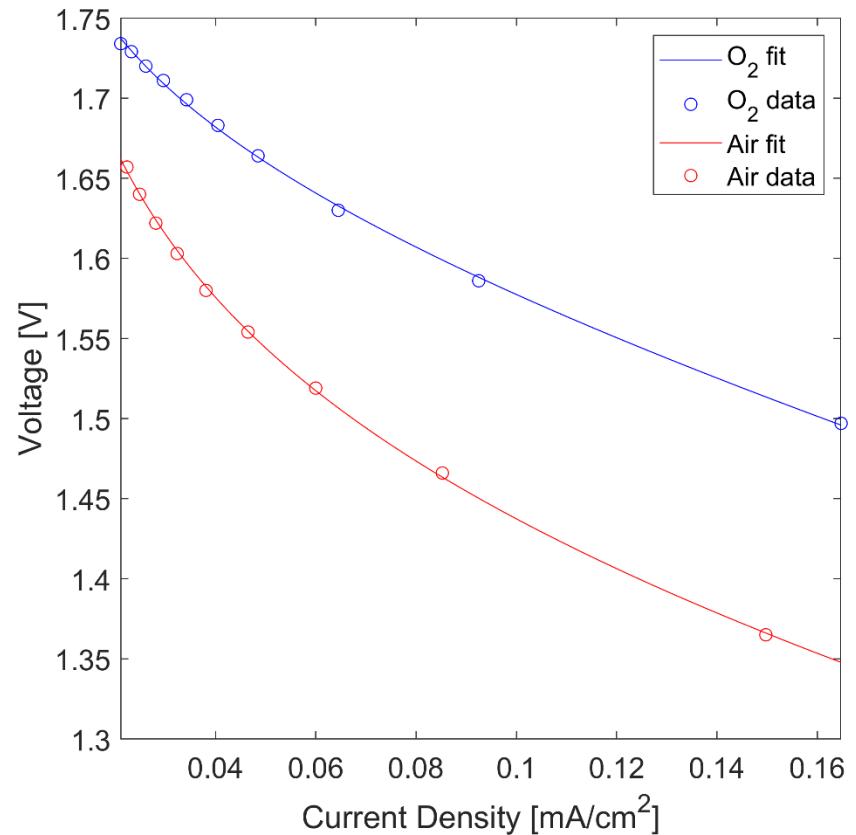
By analyzing the performances of the varied proton-exchange membranes, we can extrapolate the coefficients of the polarization.

$$[E = E_0 - b \log i - Ri - m \exp(ni)]$$

Single Membrane

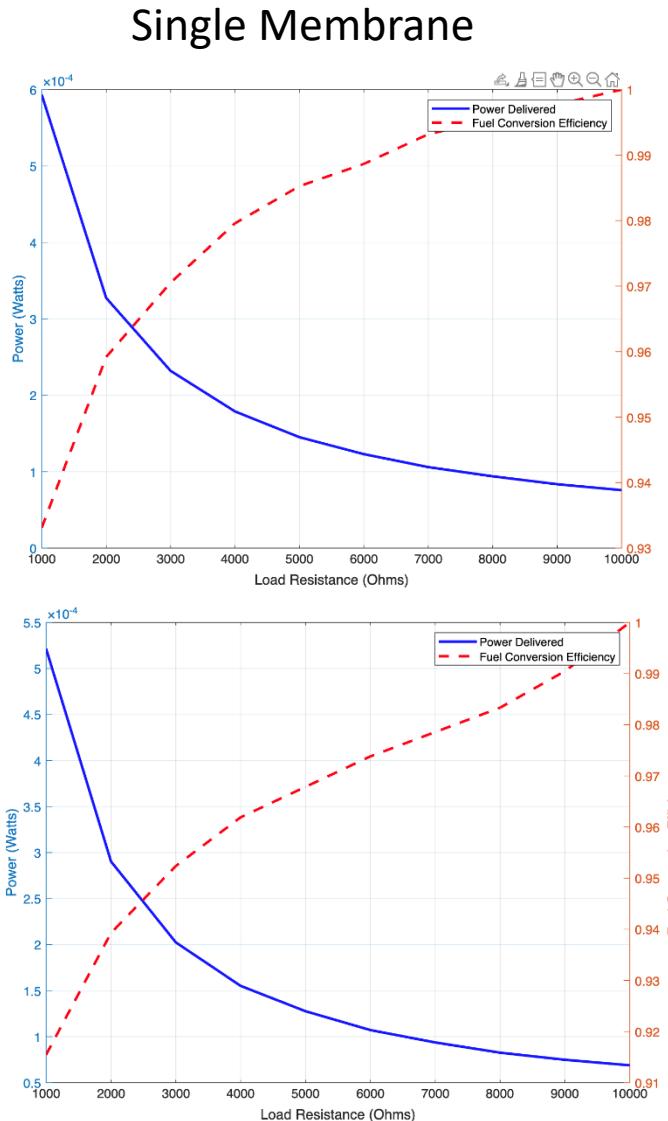


Double Membrane

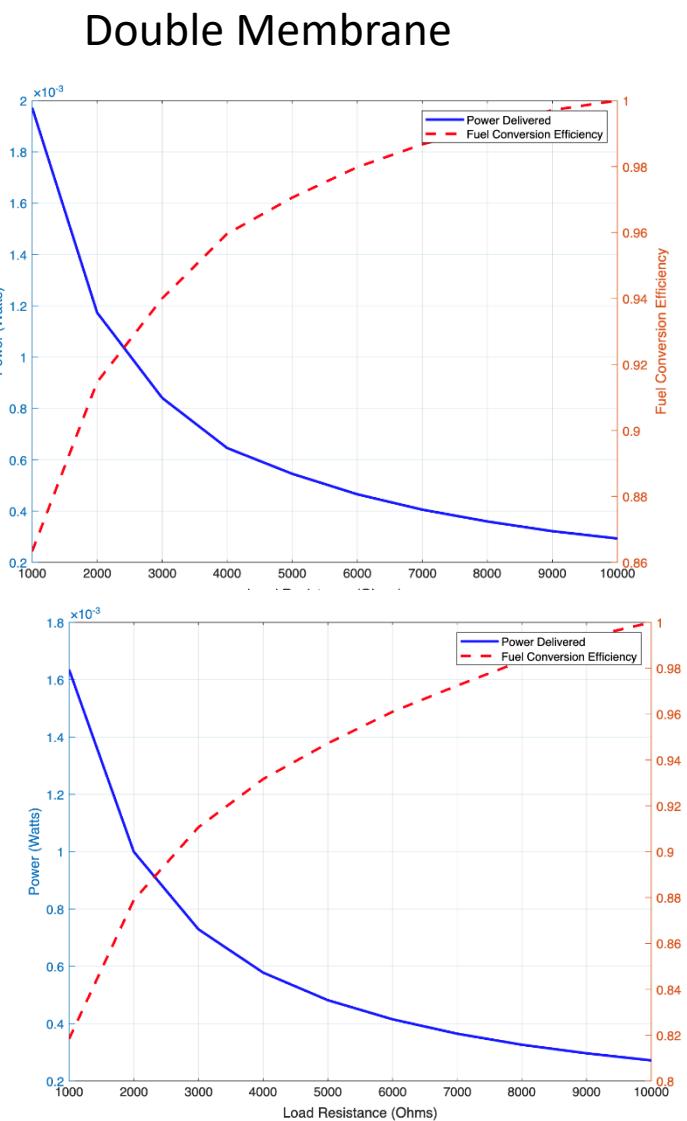


Replotting the polarization curve against the resistance applied gives us a power performance curve, which shows us the efficiency of a fuel cell.

Pure Oxygen



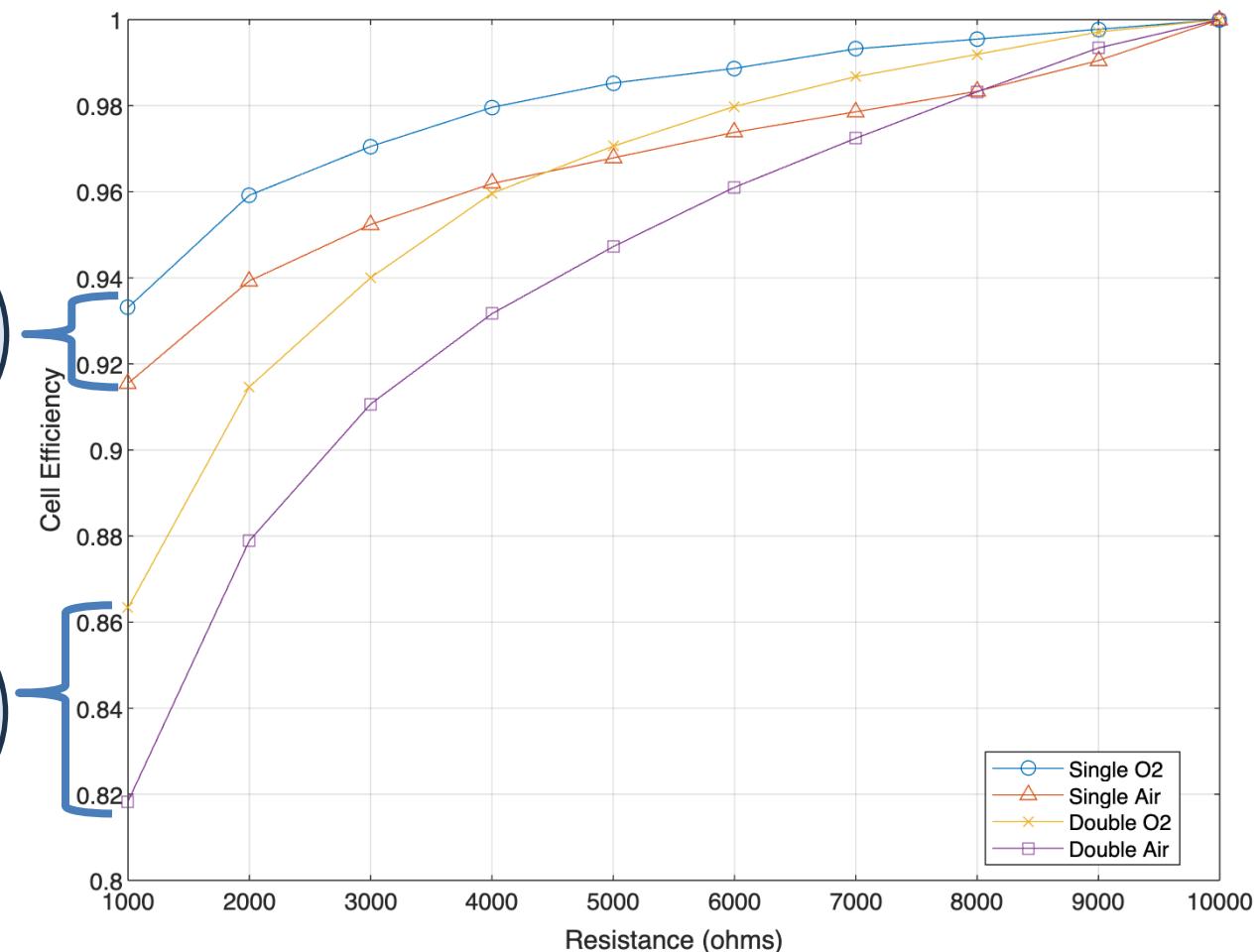
Open Air



A single membrane fuel cell which receives pure oxygen is the most efficient fuel cell among the choices we worked with.

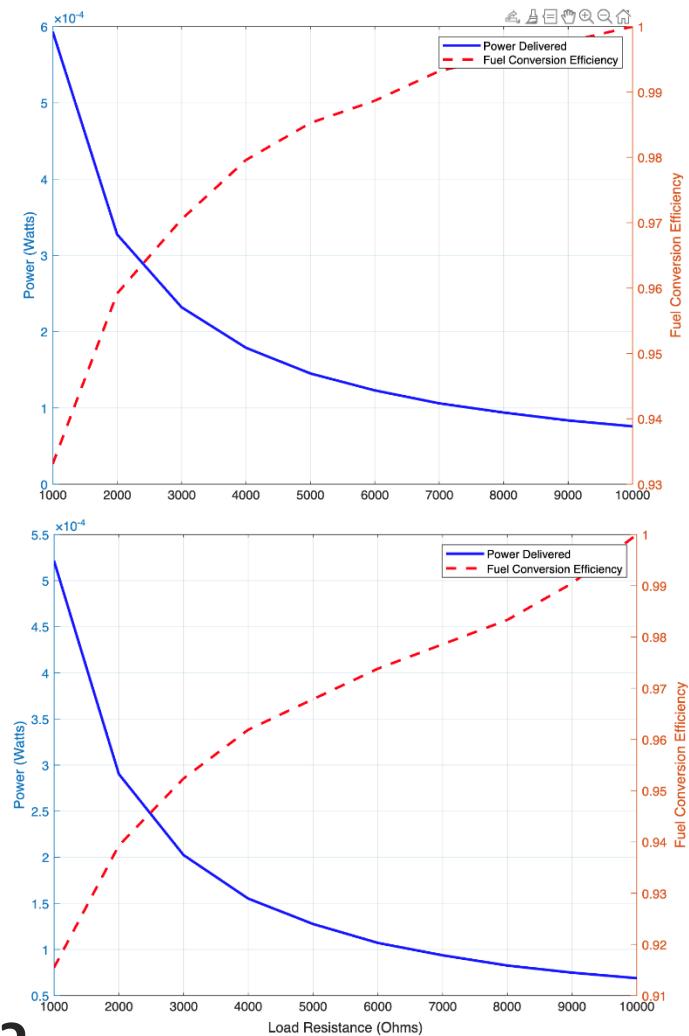
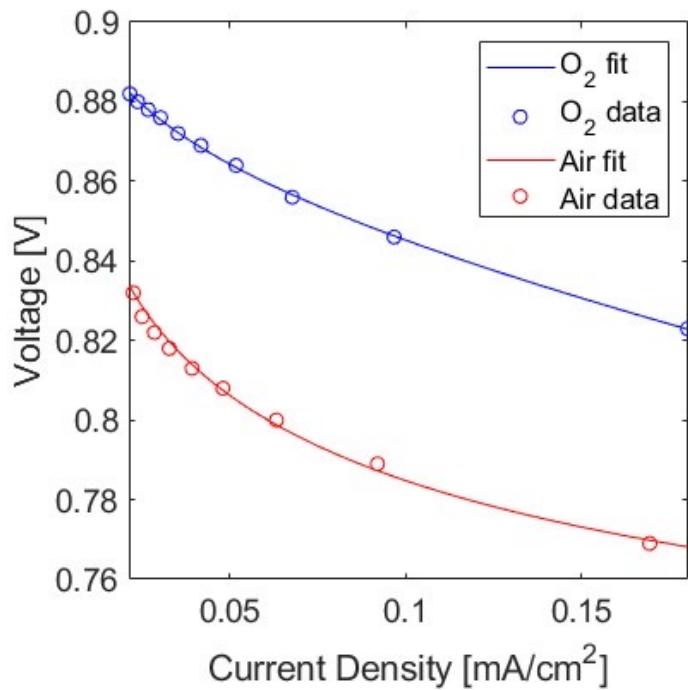
Oxygen more efficient than air

Single membrane more efficient than double membrane



In conclusion, there is not a clear choice for a best configuration to run a fuel cell, but you can make changes based on your needs.

Single Membrane



Questions?