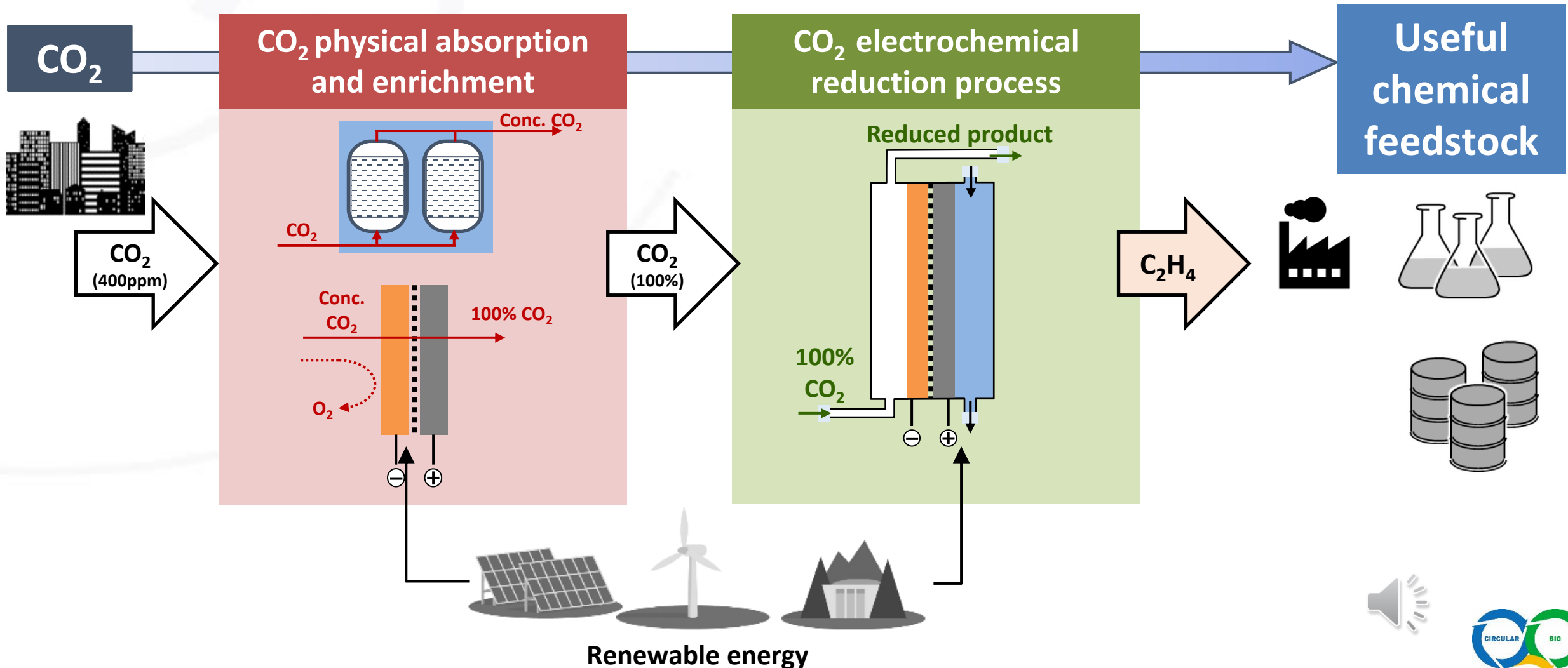


Integrated Electrochemical Systems for Scalable CO₂ Conversion to Chemical Feedstocks

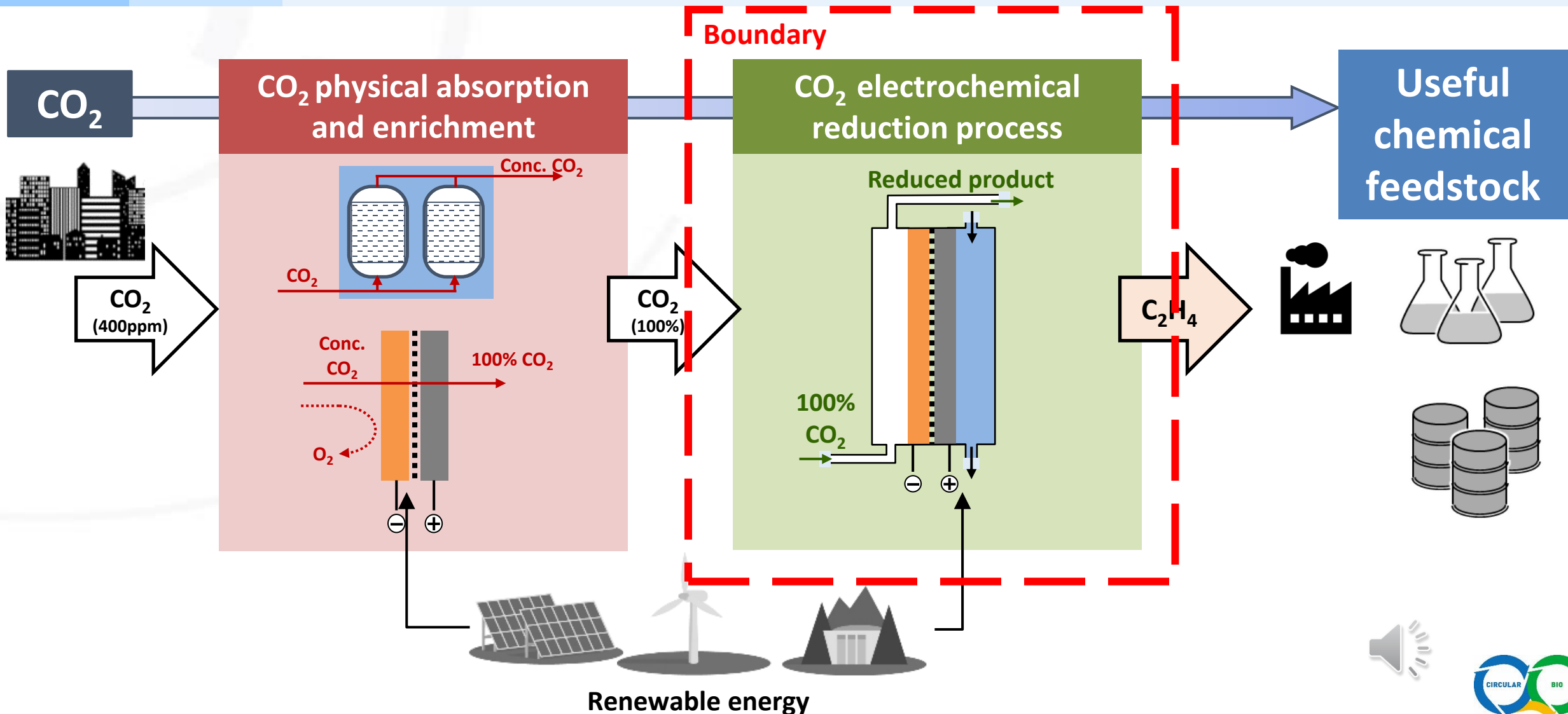
5th October 2022

Prof. SUGIYAMA Masakazu, The University of Tokyo

Integrated Electrochemical Systems for Scalable CO₂ Conversion to Chemical Feedstocks

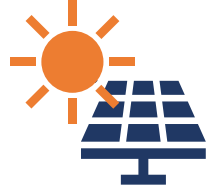


Integrated Electrochemical Systems for Scalable CO₂ Conversion to Chemical Feedstocks



CO₂ Electrochemical Reduction Process

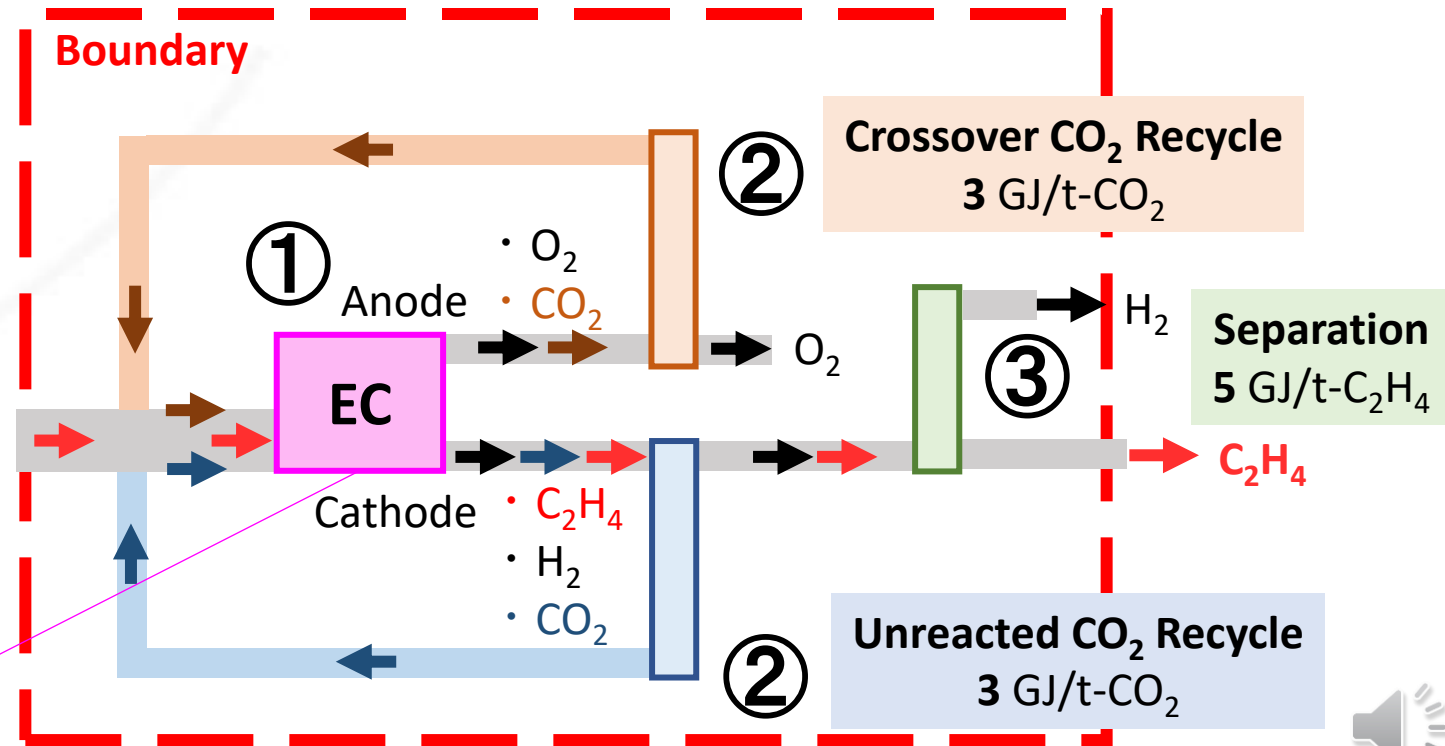
- ① Electrochemical Reduction of CO₂
- ② Recycling processes for unreacted CO₂
- ③ Product separation process



Power source
(Photovoltaics)
0.03 kg-CO₂/kWh

EC: Electrochemical Cell
for CO₂ reduction

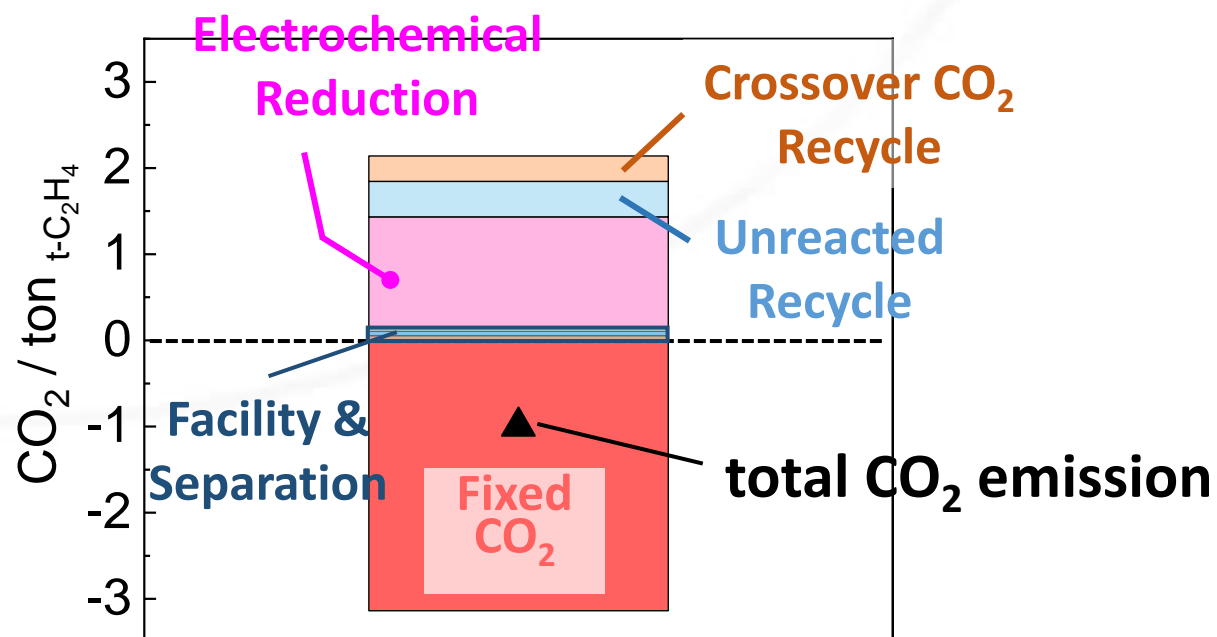
- Cell voltage 3 V
- Faradaic efficiency 80 %
- Conversion rate 10 %
- Crossover ratio 50 %



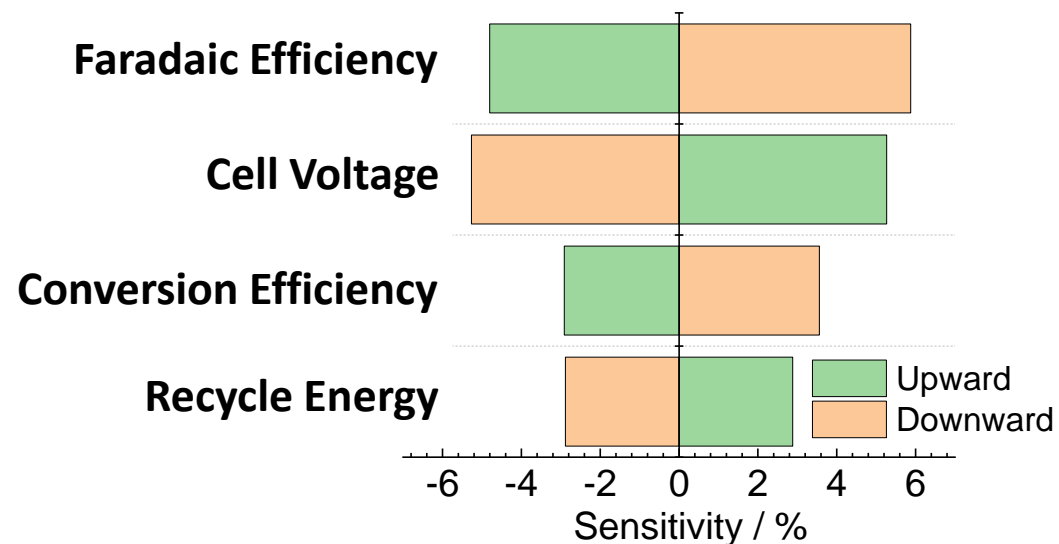
Lifecycle CO₂ Emission Analysis

- Most CO₂ emissions come from the electrochemical process.
- Operating parameters such as faradaic efficiency and cell voltage are critical.

CO₂ emission



Sensitivity



Integrated Electrochemical Systems for Scalable CO₂ Conversion to Chemical Feedstocks

Future work

