

CRC

# Post-COVID, Post-Carbon Research

SUMMER 2020

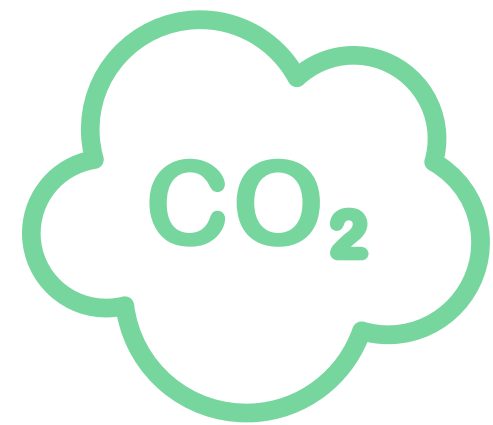
Annamarie Eustice



# OVERVIEW

## Recommendation:

Virtual Offering of Electrochemical Society Meetings



### Carbon Reduction Potential

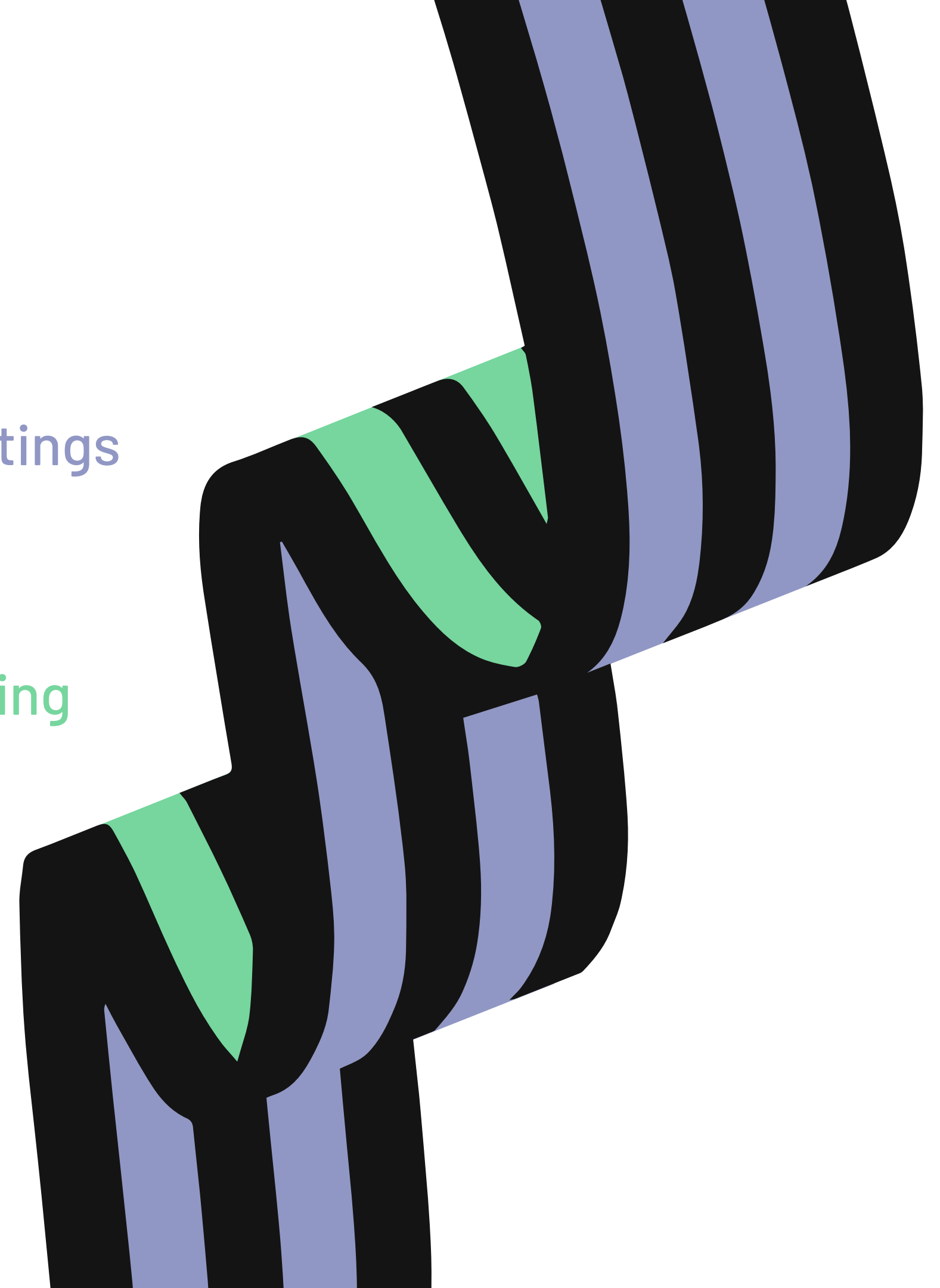
27.3 - 1,500 metric tons per meeting

0.30 metric tons by Water Lab

### Cost Savings

for Electrochemical Society: \$172,667

for GT Water Lab: \$7340



# BACKGROUND

The Water Lab at Georgia Tech conducts research on the thermodynamics and interface science of electrochemical technologies and frequently attends the biannual meeting of the Electrochemical Society.

The Electrochemical Society (ECS) is a professional society based in the United States that organizes the exchange of information on the subject of electrochemistry and solid-state science and engineering and publishes peer-reviewed journals. ECS has ~8,000 individual members and ~100 corporate members in 70+ countries.



# DESCRIPTION & MOTIVATION

- Proposal: Future Electrochemical Society Meetings provide virtual access so that 50% of registered attendees can participate remotely.
- An online conference platform can function as an virtual meeting hall with presentations, classes, poster and video presentations, speed networking in break out video sessions, and the option to virtually “walk up” to individuals and begin text or video conversations.
- Motivations: Researchers are among the top creators of flight emissions. Meanwhile, studies have shown no relationship between air travel emissions and academic productivity and even revealed that a large carbon footprint can negatively impact a researcher's credibility.

4 hour flight round-trip CO2 emissions = 0.99 metric tons [5]

**Bracket calculation - low estimate:**

0.99 metric tons x 3,000 attendees/ 116.1 persons per flight = 25.58 metric tons of CO2

0.99 metric tons x 1,500 attendees/ 116.1 persons per flight = 12.79 metric tons of CO2

25.58 metric tons - 12.79 metric tons = 12.79 metric tons of CO2 reduced by air travel

**Bracket calculation - high estimate:**

0.99 metric tons x 3,000 attendees = 2,970 metric tons of CO2

0.99 metric tons x 1,500 attendees = 1,485 metric tons of CO2

2,970 metric tons - 1,485 metric tons = 1,485 metric tons of CO2 reduced by air travel

15 miles x 2 (round trip) x 3000 cars taken = 90,000 miles driven

25.5 mpg x 90,000 miles = 28.97 metric tons of CO2 [5]

15 miles x 2 (round trip) x 1500 cars taken = 45,000 miles driven

25.5 mpg x 45,000 miles = 14.48 metric tons of CO2 [5]

28.97 metric tons - 14.48 metric tons = 14.48 metric tons of CO2 reduced by car transport

14.48 metric tons + 12.79 metric tons = 27.27 total reduced metric tons of carbon  
14.48 metric tons + 1,485 metric tons = 1,499.5 total reduced metric tons of carbon

**Total carbon reduction potential: Between 27.27 and 1,499.5 metric tons of CO2**

Placed in perspective, the average passenger vehicle emits 4.63 metric tons of CO2 per year[6]. Meaning it would take between **5.9 and 324 years** for a typical car to reach this level of emissions impact.

2 cars x 11 miles to Hartsfield-Jackson from GT x 2 x 25.5 mpg = 0.01 metric tons of CO2 [5]

Round trip CO2 emissions from Atlanta to Chicago flight = 0.27 metric tons [5]

2 cars x 30 miles round trip x 25.5 mpg = 0.02 metric tons of CO2 [5]

0.01 + 0.27 + 0.02 metric tons = **0.30 total metric tons of CO2 reduced by Water Lab's virtual attendance to ECS meeting**

# CARBON REDUCTIONS

Between 27.3 and 1,500  
metric tons of CO2!!!

It would take the average passenger vehicle  
between 5.9 and 324 years to reach this level  
of emissions!!!

# COST SAVINGS

No upfront investment

Cost savings of \$172,667 per meeting -> \$345,333 in yearly savings for ECS and \$14,680 in yearly savings for Water Lab

Net Present Value with 3% interest rate over 10 years = \$2,945,763 for ECS and \$125,223 for the Water Lab

*The Electrochemical Society*

\$1250 per hour [10] x 8 hours x 5 days = \$50,000 for venue rental

\$50,000 / 2 = \$25,000 for venue rental for 50% attendees

\$12,000 x 5 days = \$60,000 for snacks and beverages for all attendees

\$60,000 / 2 = \$30,000 for snacks and beverages for 50% attendees

50 staff x \$20 per hour x 8 hours x 5 days = \$40,000 to staff full event

\$40,000 / 2 = \$20,000 for staff of 50% event

\$20,000 + \$30,000 + \$25,000 - \$14,000 for virtual event platform [8] = \$61,000 in saved event planning funds

Registration fee of \$670 x 3,000 attendees = \$2,010,000 revenue for ECS

(Registration fee of \$670 x 1,500 attendees) + (\$670 x 2/3 x 2500 attendees) = \$2,121,667 registration revenue for ECS

(\$2,121,667 - \$2,010,000) + \$61,000 = **\$172,667 Cost Savings for ECS**

\$172,667 x 2 = **\$345,333 in Yearly Savings for ECS**

With 3% interest rate over 10 years and no initial investment this yields a **Net Present Value of \$2,945,763.38**

*The Water Lab*

6 attendees x \$1,000 per attendee = \$6,000 for Water Lab to attend meeting

6 attendees x \$670 x 1/3 = \$1,340 saved from registration fees

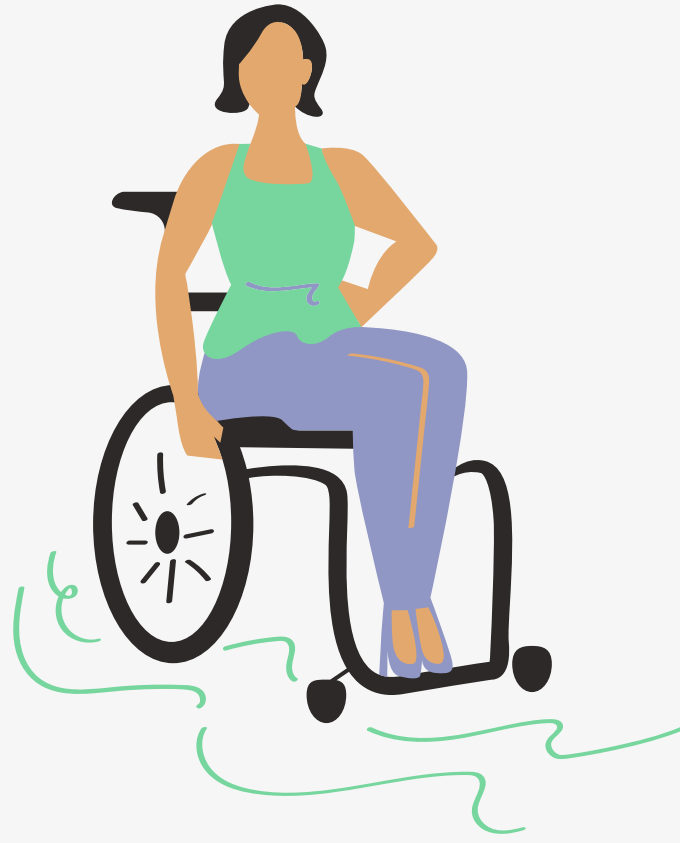
\$6,000 + \$1,340 = **\$7,340 Cost Savings for Water Lab**

\$7,340 x 2 = **\$14,680 in Yearly Savings for Water Lab**

With 3% interest rate over 10 years and no initial investment this yields a **Net Present Value of \$125,223.38**



# CO-BENEFITS



Inclusivity



International  
Collaboration



Productivity

# NEXT STEPS & ANTICIPATED OBSTACLES

## Potential Obstacles:

- Gathering support from majority of ECS members and leadership.
- Finding the most suitable platform for specific conference needs.

## Next Steps:

- Meeting with members of the ECS Board of Directors and Meetings Committee
- Sharing these numbers and starting movement amongst ECS research groups.
- Report on virtual conference platforms that meet the needs of all parties and optimizes networking, collaboration, and learning.



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