



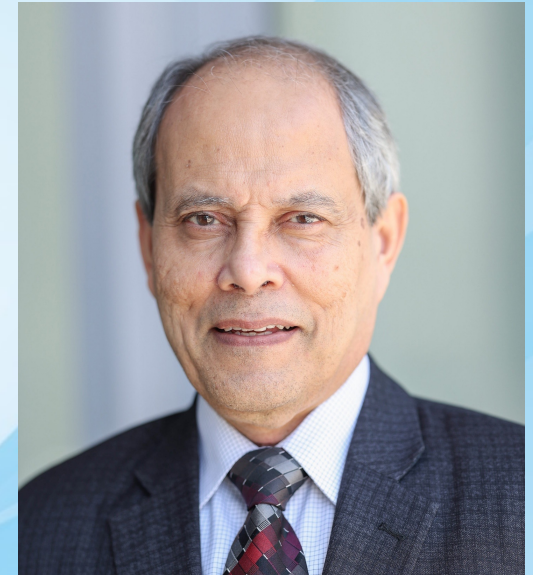
**IEEE ASEAN  
INDUSTRY  
ROUNDTABLE  
DISCUSSION  
ON CLIMATE  
CHANGE**

**ENABLING LEADERS  
TO BUILD A SUSTAINABLE FUTURE**

**27TH OCTOBER 2023**

# Climate Change

**IEEE:** Enabling Innovation and Technology Solutions



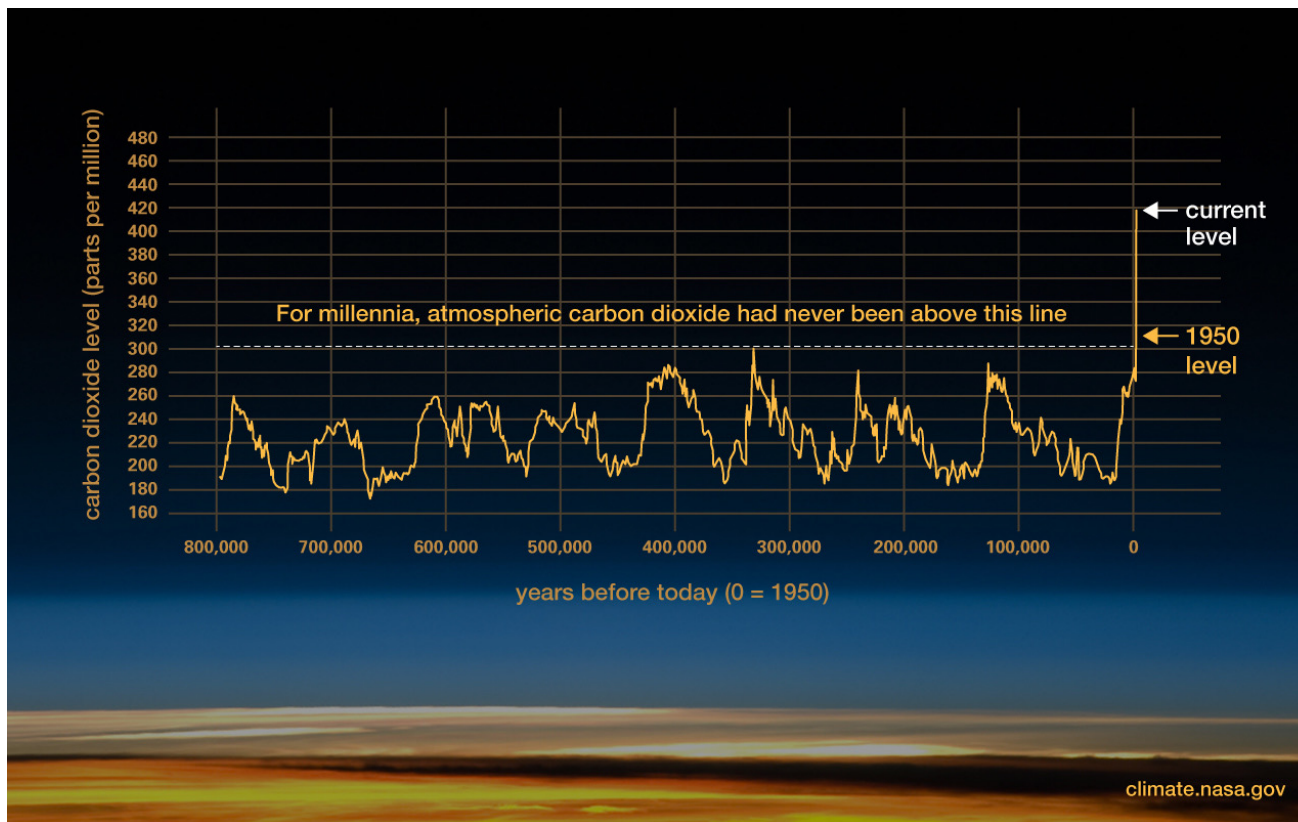
**Prof. Saifur Rahman**  
**2023 IEEE President & CEO**



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# What is Carbonization ?



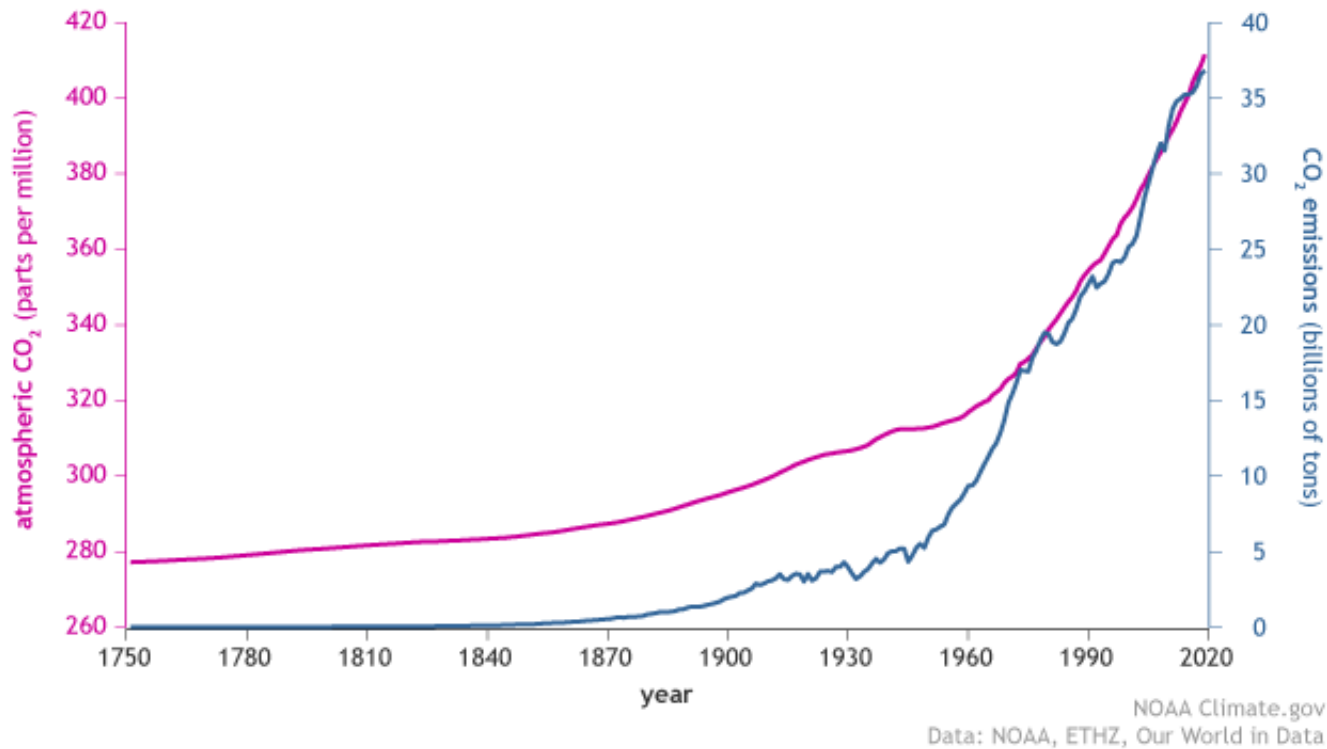


Source: NASA

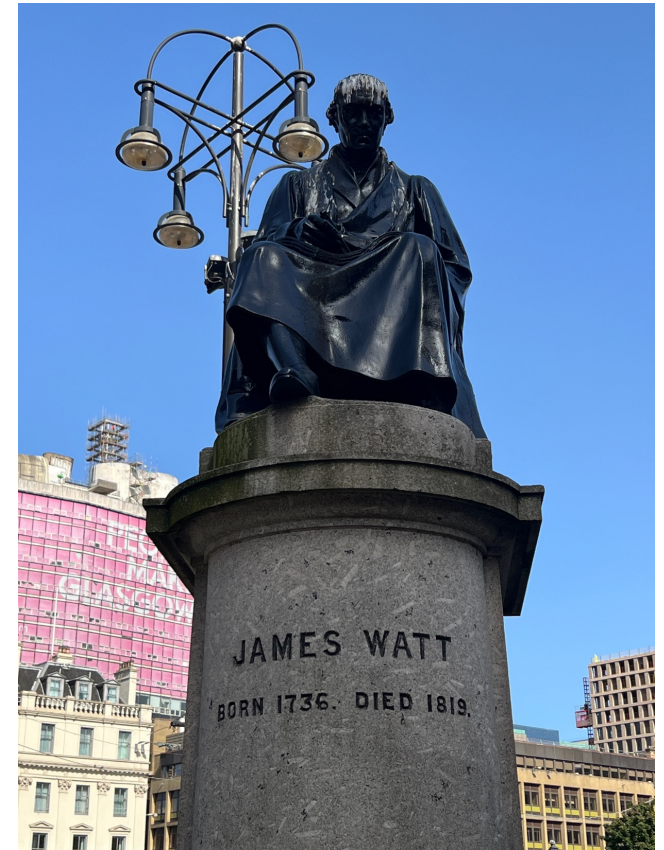
[https://climate.nasa.gov/climate\\_resources/24/graphic-the-relentless-rise-of-carbon-dioxide/](https://climate.nasa.gov/climate_resources/24/graphic-the-relentless-rise-of-carbon-dioxide/)



## CO<sub>2</sub> in the atmosphere and annual emissions (1750-2019)



Source: State of the Planet  
<https://news.climate.columbia.edu/2021/02/25/carbon-dioxide-cause-global-warming/>



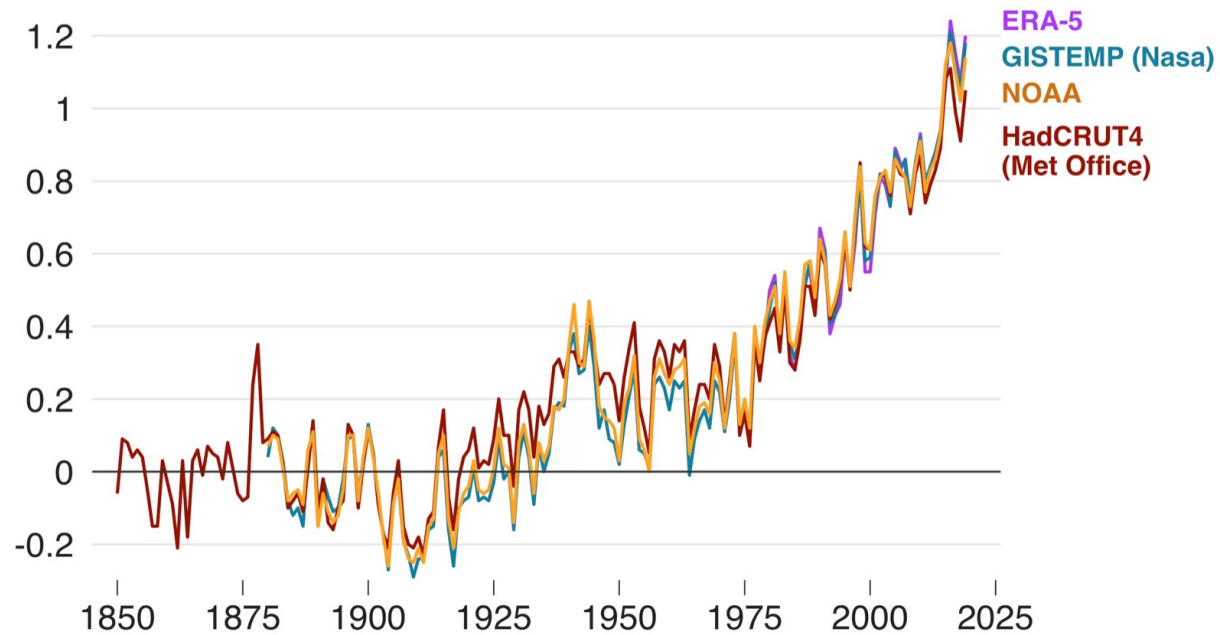


# Impacts of Carbonization



## Temperature rise since 1850

Global mean temperature change from pre-industrial levels, °C



Source: Met Office

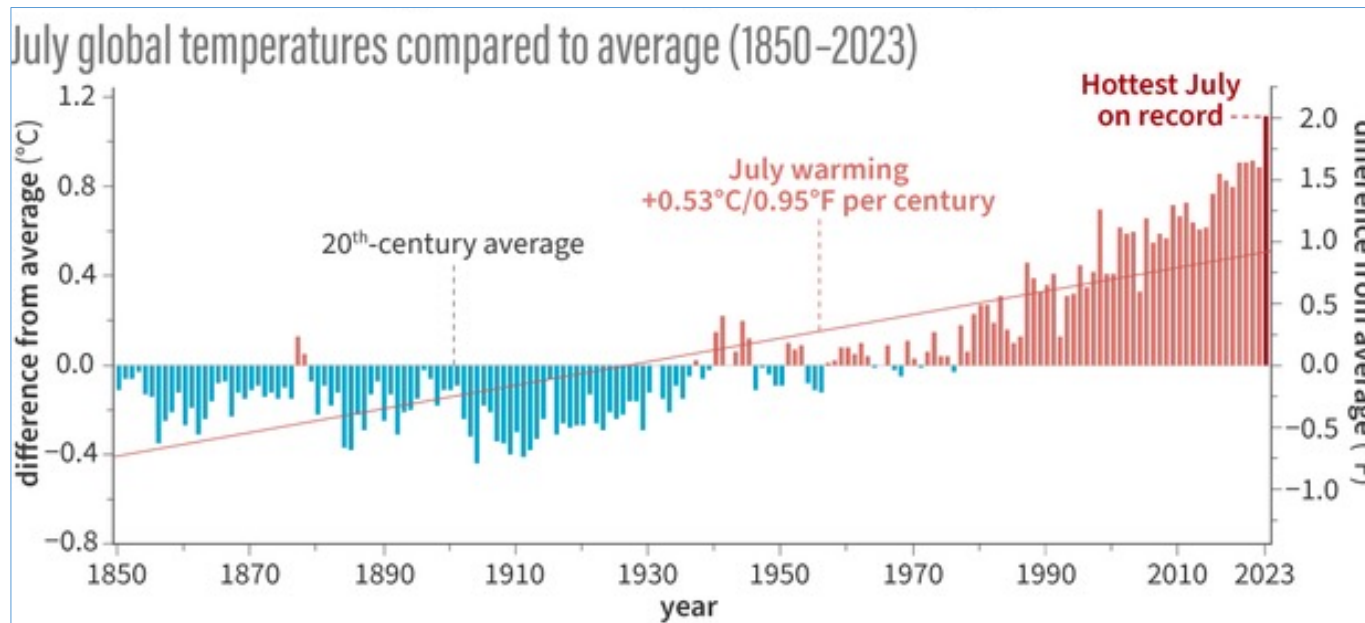
BBC

Source: <https://www.bbc.com/news/science-environment-51111176>

Temperature rise target is below 1.5. More than 2.0°C Point of No Return



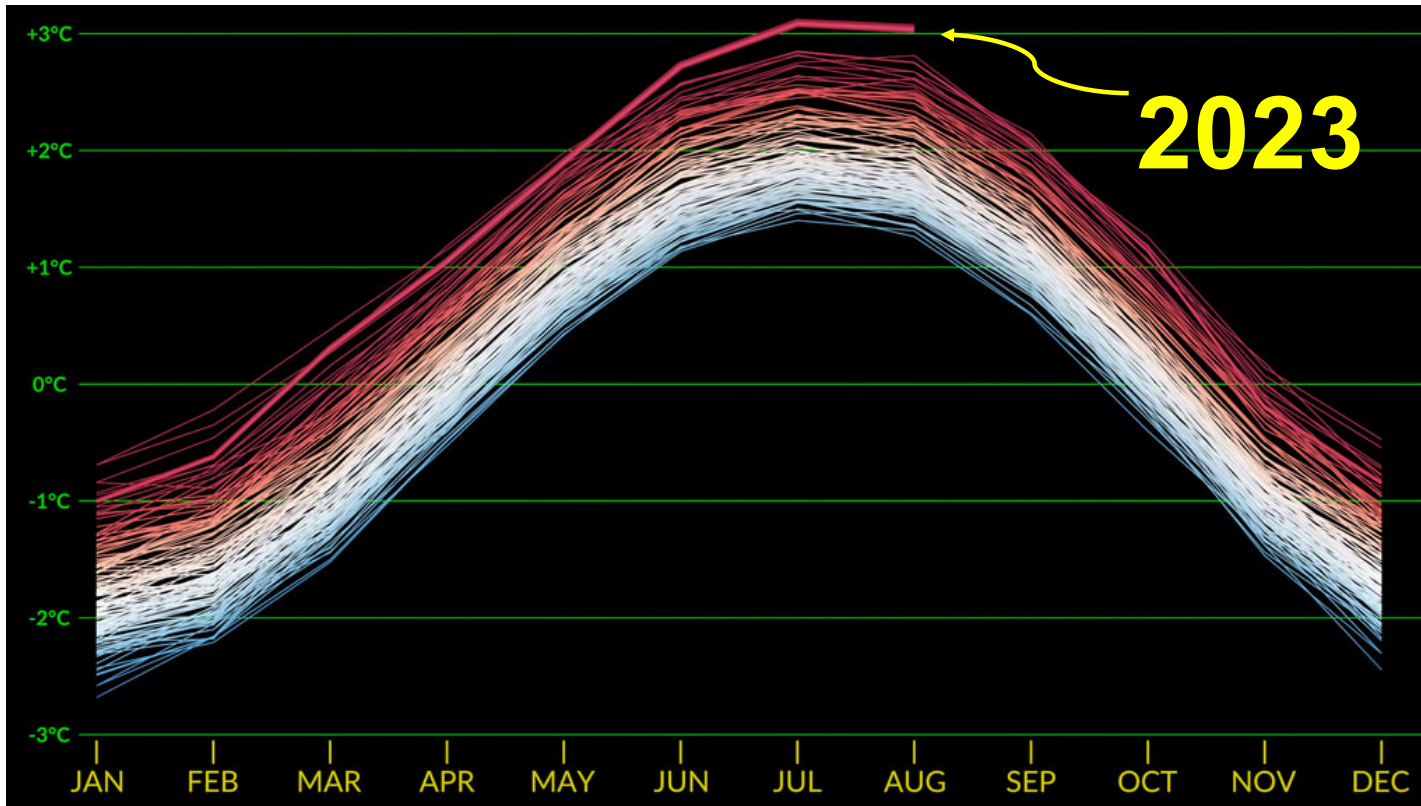
# Global Climate Summary for July 2023



July temperatures compared to the 20th-century average for each year from 1850 through 2023, which set a new record for the hottest July. NOAA Climate.gov image, based on data from NOAA National Centers for Environmental Information.

The July global surface temperature was 1.12°C (2.02°F) above the 20th-century average of 15.8°C (60.4°F), making it the warmest July on record. This marked the first time a July temperature exceeded 1.0°C (1.8°F) above the long-term average.

July 2023 was 0.20°C (0.36°F) warmer than the previous July record from 2021. July 2023 marked the 47th-consecutive July and the 533rd-consecutive month with temperatures at least nominally above the 20th-century average.



Monthly temperature anomalies from 1880 to August 2023 measured with respect to the baseline period 1951-1980.

This graph includes the seasonal cycle showing that June 2023, July 2023, and August 2023 were each consecutively the warmest month on record.

# Climate-change Impacts



Pethi Belaid/Agence France-Presse — Getty Images





# Beijing



Flooded street after heavy rains in Zhuozhou, in northern China's Hebei province August 2, 2023. (AFP)

Source: <https://english.aawsat.com/features/4470081-what-caused-record-rainfall-beijing-and-northern-china>



Residents are evacuated by rubber boats through flood waters in Zhuozhou in northern China's Hebei province, south of Beijing, Wednesday, Aug. 2, 2023. China's capital has recorded its heaviest rainfall in at least 140 years over the past few days. Among the hardest hit areas is Zhuozhou, a small city that borders Beijing's southwest. (Andy Wong/AP)

Source: [https://www.stripes.com/theaters/asia\\_pacific/2023-08-02/beijing-china-rainfall-deaths-10925575.html/](https://www.stripes.com/theaters/asia_pacific/2023-08-02/beijing-china-rainfall-deaths-10925575.html/)

# Flooding in Pakistan – August 2022



Source: <https://www.npr.org/sections/pictureshow/2022/08/30/1119979965/pakistan-floods-monsoon-climate>



Source: <https://www.nytimes.com/2022/09/07/briefing/climate-change-heat-waves-us-europe.html>





# Brazil



Aerial view of the area affected by an extratropical cyclone in Rio Grande do Sul State, Brazil **Sept 2023**  
(AGENCIA RBS/AFP via Getty Images)

# Flooding in Libya



Thousands of Lives Lost

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# Greece



A vehicle crosses a flooded road in the city of Volos, central Greece  
(AFP via Getty Images) Sept 2023



Cars in a flooded road in the city of Volos, central Greece  
(AFP via Getty Images) Sept 2023



# Droughts in 2022



Dry riverbed in **Italy** (Po River) due to worst drought in 70 years, June 2022

<https://idsb.tmgrup.com.tr/ly/uploads/images/2022/07/08/217454.jpg>

The Jialing Riverbed at the confluence with the Yangtze River is exposed due to drought on August 18, 2022 in **Chongqing, China**.

<https://image.cnbcfm.com/>



# Wildfires in the US



July 2021 - The Dixie fire burned close to a million acres in **California's** Lassen county over three months and became the first fire to cross the Sierra Nevada. Photograph: Noah Berger/AP

Peaks glowing with thousands of spot fires on 13 June 2022, in Flagstaff, **Arizona**. Schumacher/The Republic



# Wildfires in Europe - Summer of 2022



Southwestern [France](#), July 17, 2022



Central [Portugal](#), July 13, 2022



Brandenburg, [Germany](#), August 2022



[Greece](#), July 2022



Northern [Spain](#), June 2022



Central [Italy](#), July 2022

**“The number of wildfires in 2022 in the EU have nearly quadrupled the 15-year average”**

[Source: CNN according to Copernicus, EU Earth observation program](#)





# Siberia: Wildfires in June 2020 and June 2021



The Greenpeace Russia team has documented forest fires in the Krasnoyarsk region.  
JULIA PETRENKO / GREENPEACE



In this June 16, 2021 photo, firefighters work at the scene of forest fire near Andreyevsky village outside Tyumen, western Siberia, Russia. -  
Copyright AP Photo/Maksim Slutsky, File

# Greece



Before/After image of Fire Damage in Kiotari Rhodes, Greece  
Source: Maxar Technologies via BBC. July 2023



# Opportunities of Decarbonization in the Electric Power Supply Industry

Source: IEEE Spectrum, Jan 2023



## Reduce Carbon Emissions

1. Use less electricity, energy efficiency
2. Use low carbon fossil fuel power plants
3. Use H<sub>2</sub> & other storage technologies
4. Promote more renewables
5. Accept some nuclear
6. Promote cross-border power transfer



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for Humanity*

**Clean-tech Solutions for Climate Sustainability**



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# Climate Change

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*<https://climate-change.ieee.org>*

# IEEE Climate Change Program

<https://climate-change.ieee.org>



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As the world's largest organization of technical professionals, IEEE has both the opportunity and the responsibility to assist in organizing the response of engineers, scientists, and technical professionals across the world to address the causes, mitigate the impact, and adapt to climate change.

IEEE's scholarly publications, events, conference proceedings, technical standards, and other materials help foster the exchange of technical knowledge and information for the critical climate issues that our planet faces today.

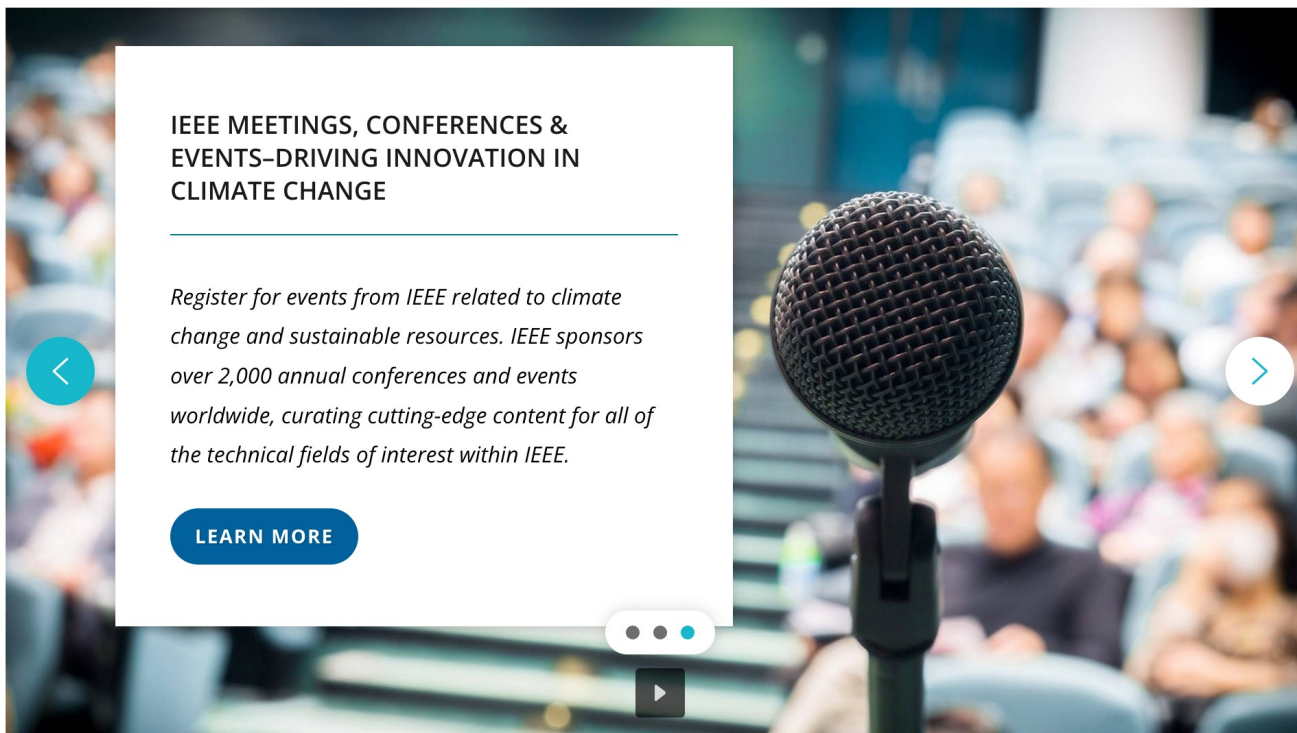


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Climate  
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