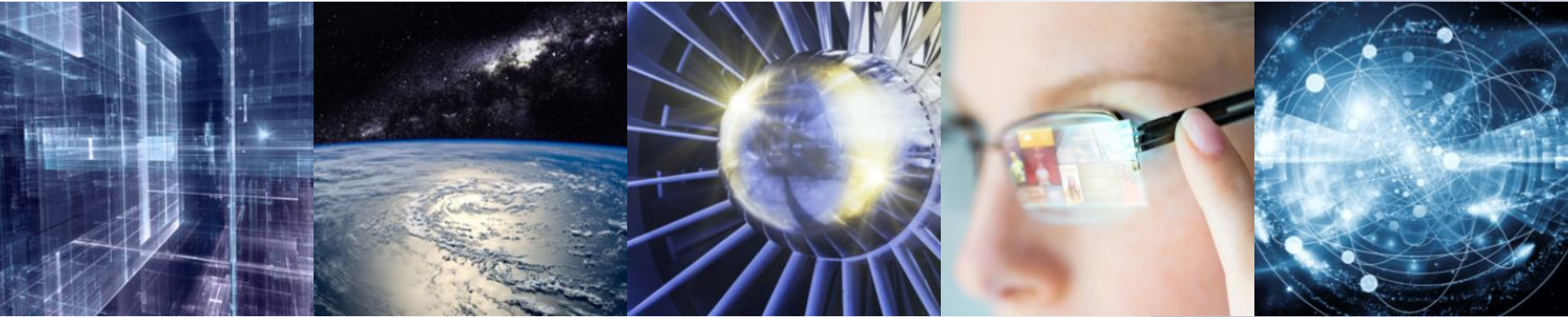




Technology for Climate Solutions

Science policy interface

IYNC and IEEE Tech for a Sust Climate

Professor Saifur Rahman, IEEE Life Fellow

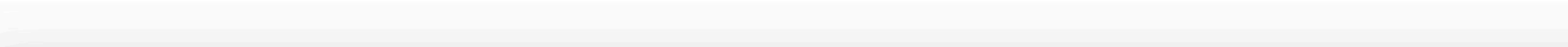
Editor-in-Chief, IEEE Climate Magazine

2023 IEEE President

29 July 2026



PPT slides are available at
www.srahman.org



Date	Recent and Upcoming Presentations and Webinars	Webinar/Presentation Slides
29 July 2026 IEEE	Technology for Climate Solutions Presentation, Science Policy Interface, IYNC and IEEE Technology for a Sustainable Climate This presentation focuses on how researchers, engineers, scientists, policymakers can benefit from technology that helps address one of the defining challenges of our time – high CO2 emissions. There are innovative solutions spanning the full breadth of climate-relevant technology: from low-carbon energy and sustainable transportation to smart infrastructure, and climate policy. This also highlights IEEE's engagement with international organizations, policy makers, industry and academia through collaborative symposiums, workshops, and invited lectures. Saifur Rahman, PhD Joseph Loring Professor of Electrical Engineering and Director, Virginia Tech Advanced Research Institute, USA 2023 IEEE President	



*Advancing Technology
for Humanity*

What Can you Do to Serve Humanity?

Clean-Tech Solutions for Climate Sustainability

IEEE's Climate Change Program

Climate
Change

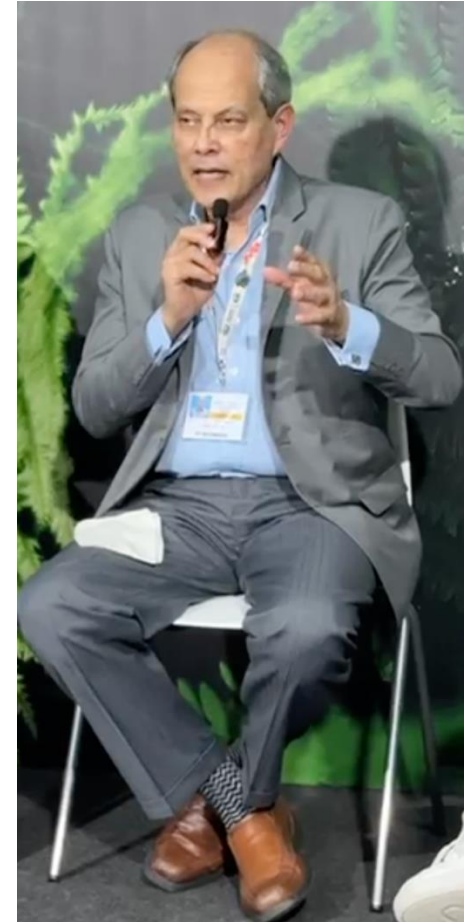
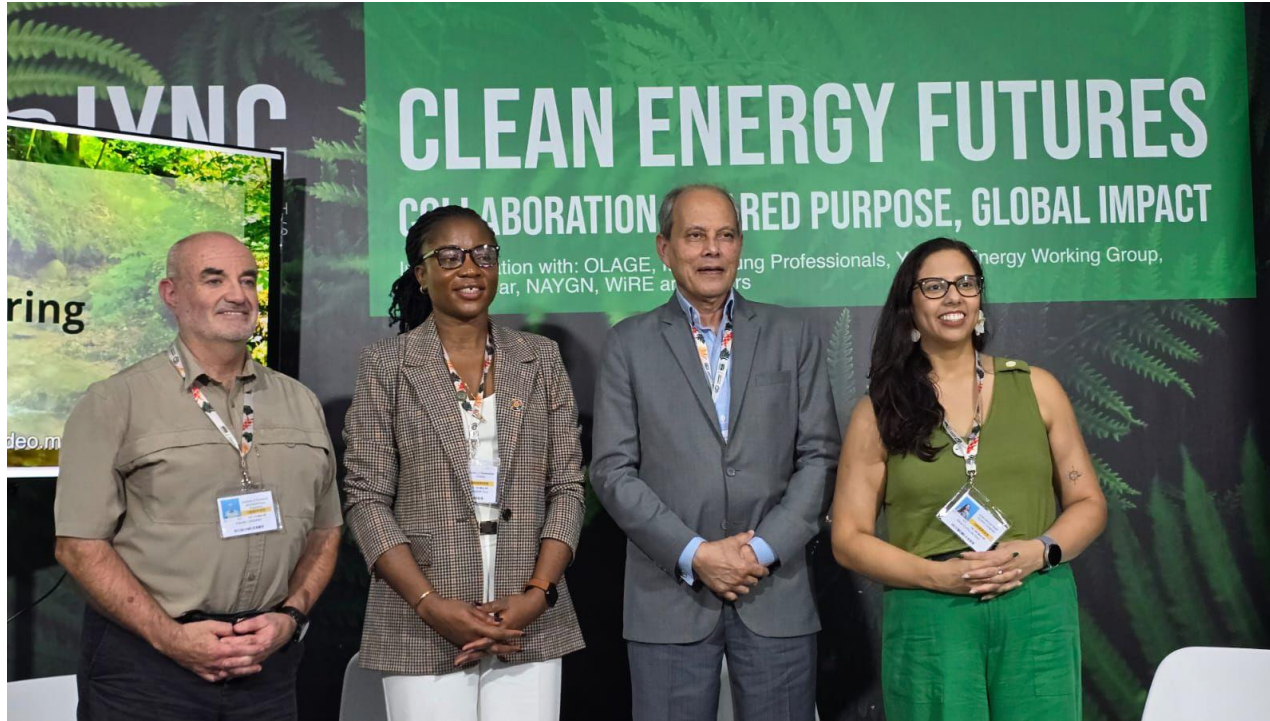
IEEE: Enabling Innovation and Technology Solutions



IEEE at UN Conference on Climate Change Belem, Brazil, November 2025, COP30

<https://cop30.br>

Talk at the IYNC Pavilion, COP30, Brazil





Strengthening Capacity Building for Energy Transition, COP30, Brazil

IEEE-ITU Symposium on Achieving a Resilience Climate

Geneva, 12-13 December 2024



Photo credit: ITU

<https://isasc.ieee.org>

IEEE-ITU Symposium on Achieving a Resilience Climate

Geneva, 15-16 December 2025



IEEE-ITU Symposium Opening Speech

<https://isasc.ieee.org>





Technology for
Climate Solutions

IEEE Climate Magazine a new open access publication
dedicated to the application of technology to climate change.

Email: climatemag@ieee.org

CO2 is the Primary Driver for Climate Change

Sources of CO2 emissions

- ▶ Transportation: 40%
- ▶ Electricity Generation: 30%
- ▶ Industry and Buildings: 30%

Technologies to Reduce Carbon Emissions



Focus on the Electricity Sector

1. Use less electricity, energy efficiency
2. Use low carbon fossil fuel power plants
3. Use H₂ & other storage technologies
4. Promote more renewables
5. Accept some nuclear
6. Promote cross-border power transfer

Controlling Building Operations Optimized for Savings

Energy savings from air conditioning control: 10-15%

Energy savings from lighting control: 15-20%



Energy Efficiency Applications

Consider light bulbs

- Provide more energy efficient applications and tools globally
- The amount of electricity required to run an LED light bulb is less than 15% of what is needed to run an incandescent light bulb producing the same amount of light



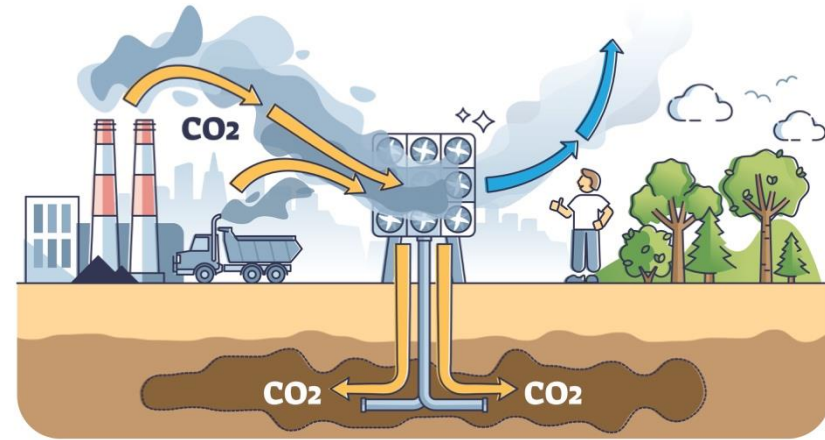
Highly Efficient Fossil-fuel Power Plants



- Combined Cycle Gas/Steam Power Plant
- Ultra-supercritical steam power plant

Carbon Capture & Storage Systems (CCS)

- Direct Air Capture (DAC) can help ensure that emissions created during the energy generation phase will not be emitted into the atmosphere
- These technologies have the potential to significantly reduce carbon emissions in energy systems across the board



Hydrogen and Storage Solutions

Optimize renewable energy solutions being integrated into energy grids



- Low-carbon hydrogen will help emerging economies to meet climate goals in and of itself
 - Provide for diverse energy portfolios
 - Improving resilience
 - Lowering costs
- Storage solutions serve as optimizers for other renewable energy solutions
 - Ensure that electricity generated during off-peak hours does not go to waste

Renewable Energy Integration

Whitelee Windfarm, Glasgow, Scotland



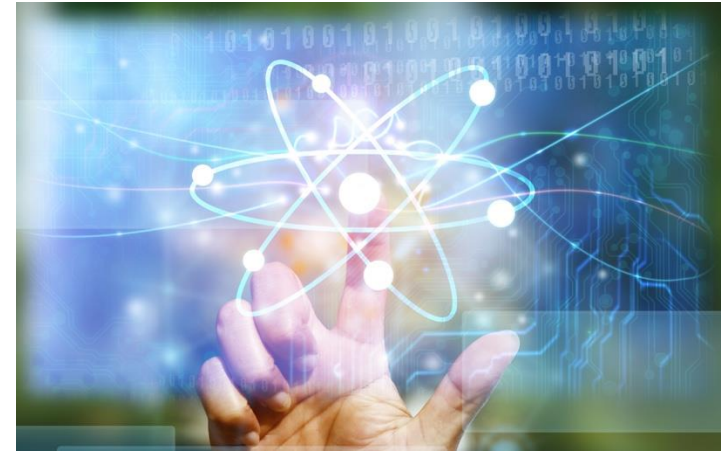
Kenya School of Monetary Studies, Nairobi



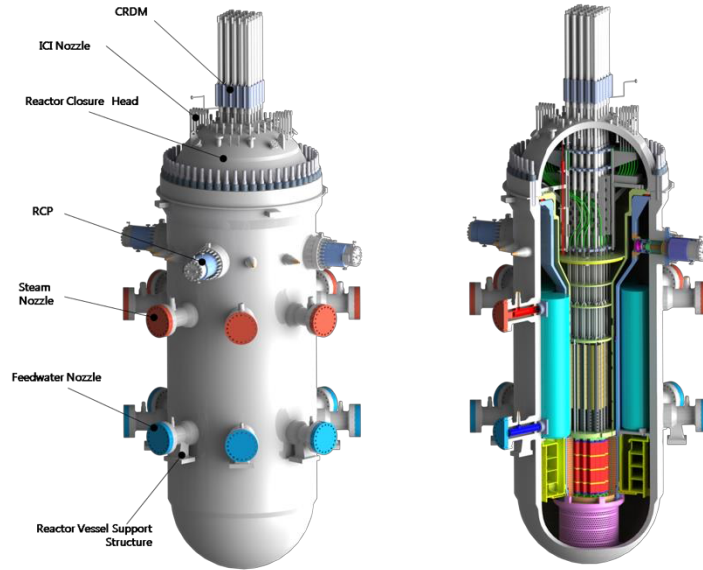
Advanced Nuclear Technologies

Diverse solutions to address climate change

- ▶ Advanced nuclear technologies, such as small modular reactors (SMRs), can play a role
 - Smaller and can be built more quickly than more traditional nuclear reactors
- ▶ Ramping up the development of SMRs can help to produce energy when and where needed
- ▶ This energy could be integrated into existing power grids
 - helping to provide improved resiliency while simultaneously reducing emissions

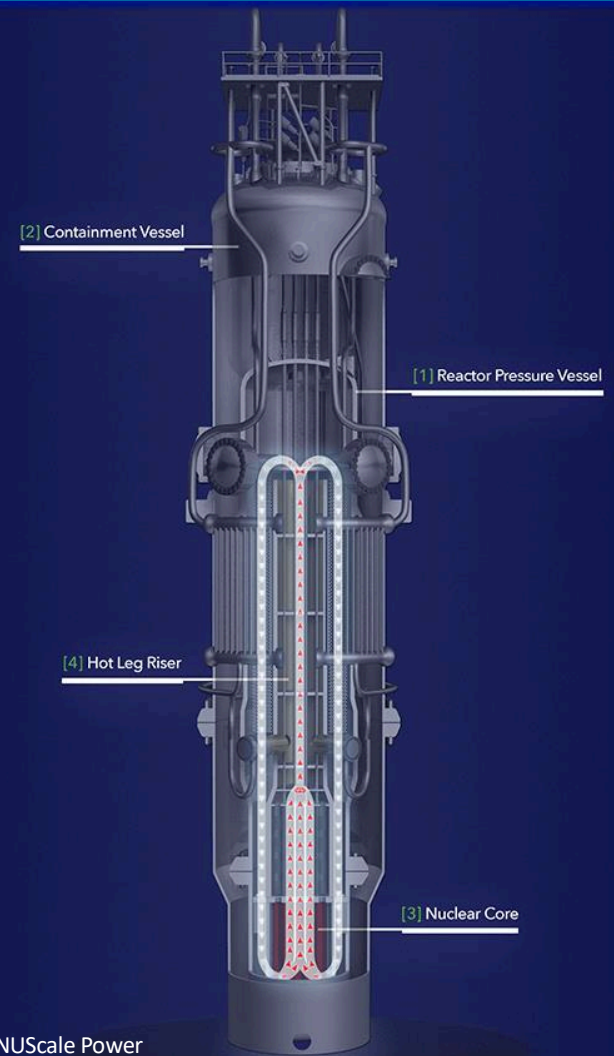


Small Modular Reactors (SMR)



20m tall, 2.7m dia. 590 tons LWR
4.95% enrichment. 50 – 60 MWe

IEEE
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Sustainable Climate™

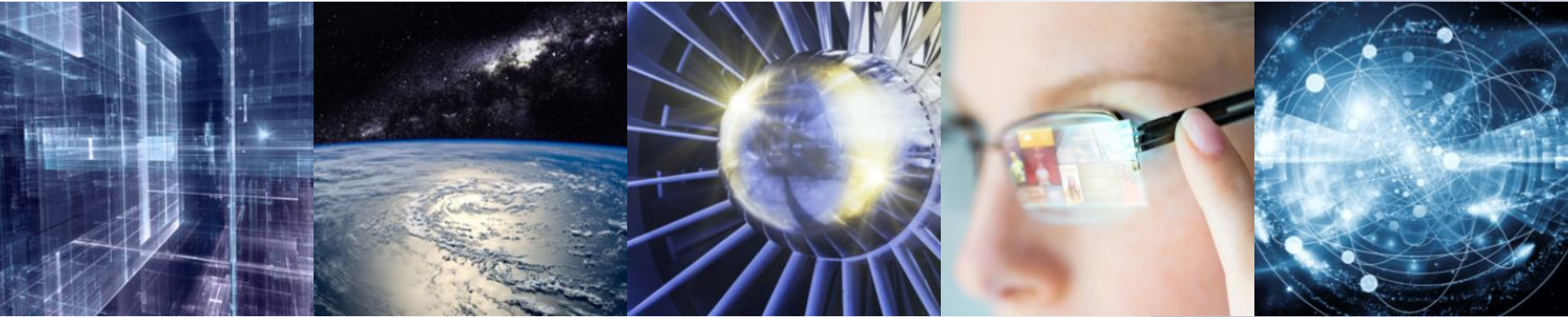


Cross-Border Energy Transfer

No Transition without Transmission

- ▶ As we are in this fight together, our solutions should be collaborative to secure better outcomes for all countries, regardless of location
- ▶ The International Energy Agency (IEA) has identified three main modes of cross-border energy integration:
 - Bilateral
 - Multilateral
 - Unified





Thank You

Saifur Rahman, 2023 IEEE President

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