



IEEE Alternative Energy Generation and Storage Initiative

Co-Chairs: Hong Chen, Nuno Borges Carvalho
Staff Program Director: Dave Magnoni

20 October 2026



Challenges

Climate Change



Generation

Load

**Intermittent
Resources**

**Retirement of
Dispatchable
Resources**

BTM

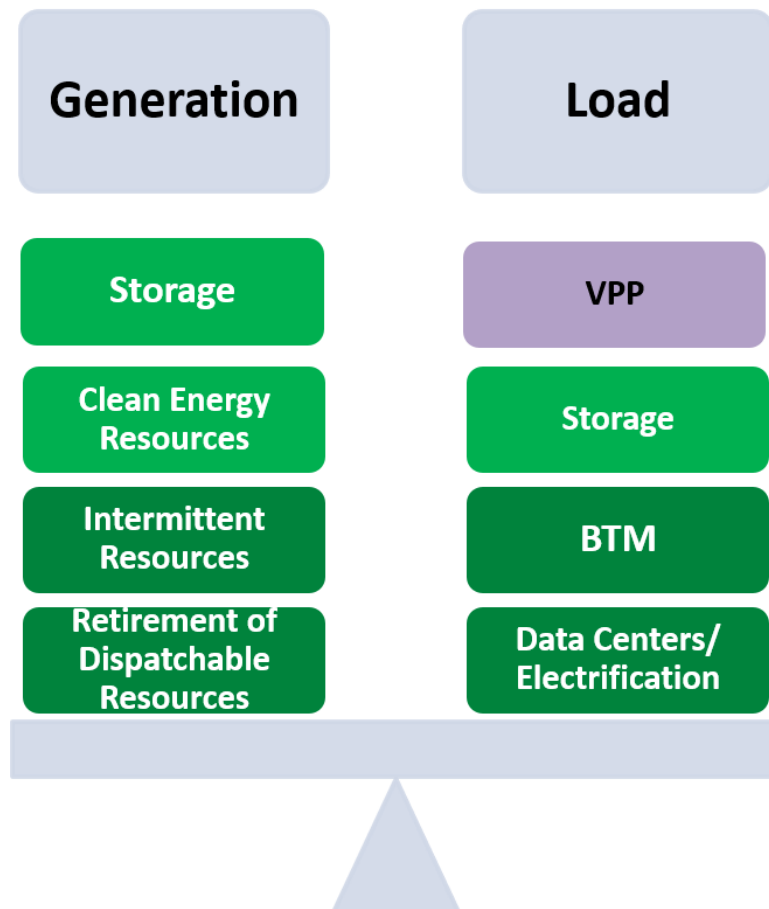
Data Centers

Electrification

AI



Solutions



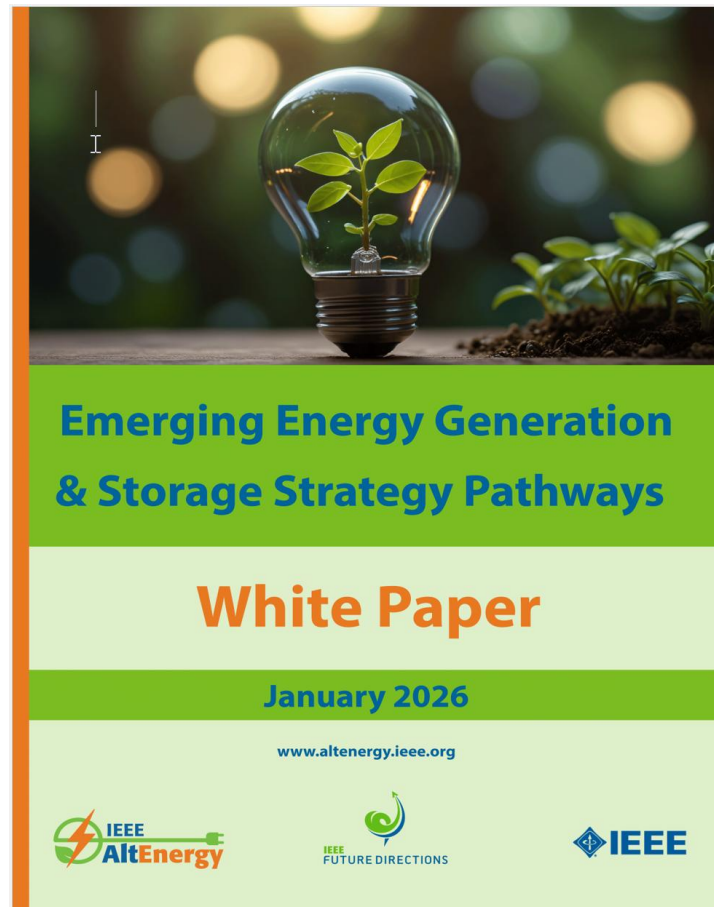
Initiative Summary

- Goals
 - Support emerging clean energy generation technologies, such as geothermal, biomass, ocean energy, hydrogen, **SMR, nuclear fusion**, space-based solar
 - Advance storage technologies to increase duration, reduce cost, increase energy density, and new battery technologies for large and small scale
- PES led multi-society initiative to join forces and develop alternative solutions for energy generation and storage to support terrestrial, ocean and space applications and support transition to Net Zero



- Website: <https://altenergy.ieee.org/>

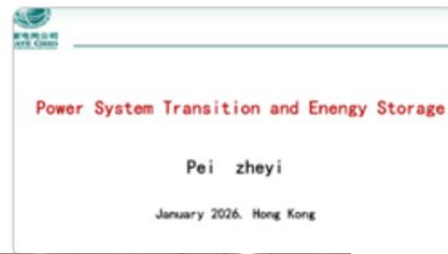
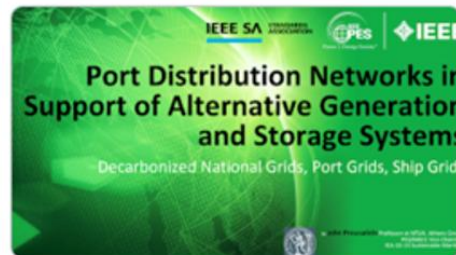
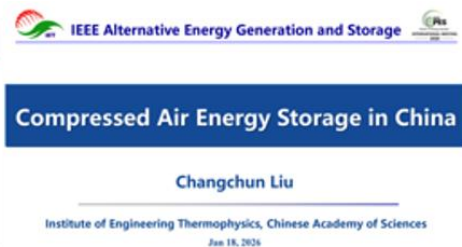
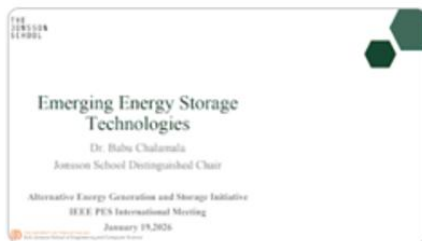
Strategy Whitepaper



IEEE Alternative Energy Generation and Storage Technologies

Area	Technologies
Renewable Baseload Energy Generation	• Hydropower • Geothermal Energy ◦ Enhanced Geothermal Systems (EGS) • Biomass Energy ◦ Marine Algae Bioenergy ◦ Artificial Photosynthesis
Renewable Intermittent Energy Generation	• Ocean Energy
Nuclear Power Generation	• Small Modular Reactors • Fusion Reactors
Space-Based Power Generation	• Space-Based Solar Power (SBSP) ◦ Modular Solar Power Satellites • Reflector-Based Systems
Emerging Battery Storage Technologies	• Solid-State Batteries • Lithium-Sulfur Batteries • Flow Batteries ◦ Organic Flow Batteries
Non-battery Electrical Storage Systems	• Supercapacitors • Superconducting Magnetic Energy Storage
Mechanical, Thermal, and Other Energy Storage Systems	• Gravity-Based Energy Storage • Compressed Air Energy Storage (CAES) • Liquid CO₂ Energy Storage • Molten Salt Storage • Sand-Based Thermal Storage • Hydrogen Energy Storage
Energy Distribution	• Wireless power grids • “Islanding” and Micro-grids • Super high voltage power lines

First Workshop at PES International Meeting



- <https://altenergy.ieee.org/webinars/>



Second Workshop at OES Oceans Conference



28 May, 2008

Coastal-Mounted Pendulum-Type Wave Power Generation Device (Wave Rudder)

Changkyu RHEEM
Institute of Industrial Science
The University of Tokyo

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Research and Demonstration
Application on Key Technologies of
Island Smart Microgrid with Wave
Energy Power Generation System

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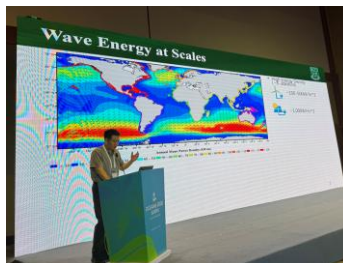
OCEANS 2026 SANYA
The IEEE Alternative Energy Generation and Storage (AEGS) second workshop
May 25-28, 2026 Sanya, China

Modelling of a Combined Wind-Wave Floating Platform for Vibration Mitigation
Fares Mzoughi, Curran Crawford, Aitor J. Garrido, Izaskun Garrido

Presenter: Fares Mzoughi, PhD

UVIC University of Victoria, Canada

UPV-EHU University of the Basque Country, Spain



Seminar at the OCEANS 2026, 25-28 May, Sanya, China

Energy Saving of Ships Propelled by Waves

A Mathematical Model of a Ship with Wings Powered by Waves

Prof. DSc Kirill V. Rozhdetsvensky, PhD Zin Min Htet
Department of Applied Mathematics & Mathematical Modeling,
Saint Petersburg Marine Technical University



Energy Harvesting from Current

- Power from Current $P_w = 0.5 \rho A U^3$
- Mechanical Power $P_m = \tau \omega = P_w \eta_b$
- Electrical Power $P_E = P_m \eta_g = P_w \eta_b \eta_g$

η_b Blade Coefficient
 η_g Generator Coefficient

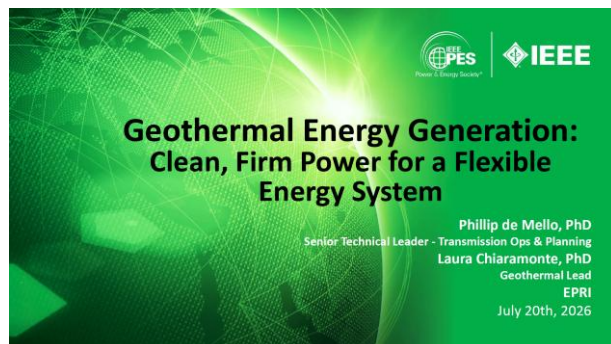
For a period of time (Ex. a month), find the likelihood of the current speed, $p(U)$

$$P_{acum} = \int_{t_1}^{t_2} P_E(t) dt$$

$$P_E(t) = \int_{U_1}^{U_2} P_E(U) p(U) dU$$

Underwater the Flow Condition, approximately 1% of the Current power can be harvested

Panel Session at IEEE PES General Meeting



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Geothermal Energy Generation: Clean, Firm Power for a Flexible Energy System

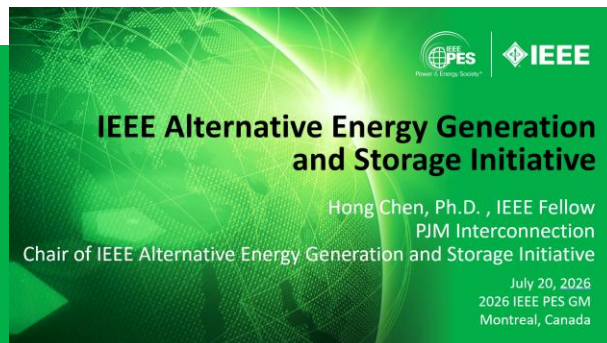
Phillip de Mello, PhD
Senior Technical Leader - Transmission Ops & Planning
Laura Chiaramonte, PhD
Geothermal Lead
EPRI
July 20th, 2026



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Overview of Small Modular Reactors

Ron Maritzel, Senior Director, X-energy
July 20, 2026



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IEEE Alternative Energy Generation and Storage Initiative

Hong Chen, Ph.D., IEEE Fellow
PJM Interconnection
Chair of IEEE Alternative Energy Generation and Storage Initiative
July 20, 2026
2026 IEEE PES GM
Montreal, Canada



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Hydrogen Economy Infrastructure Development

Wei-Jen Lee, PhD, PE, IEEE Fellow
Professor and Chair
Department of Electrical Engineering
The University of Texas at Arlington
July 20, 2026



IEEE SmartAg | IEEE PES | IEEE

Storage of intermittent green energy via plasma catalyzed chemical manufacturing

John Verboncoeur, IEEE Fellow
Michigan State University and
co-chair IEEE Smart Agri-food Systems
20-Jul-2026



Third workshop at IEEE WiSEE Conference

-- Space-based Solar Power



Initiative Activity Plan



Spread Word and Join the effort !

Email: aegs@ieee.org