Call For Papers

The 47th International Technical Conference on Clean Energy

July 23 to 27, 2023

Clearwater, Florida, USA

- **Topics are Highly Relevant; Advanced; Science and Technology Driven; and Aimed at Clean Energy Supply;**
- **Attendance can be actual or virtual;**
- **Prime location, adjacent to an international airport;**
- **Reasonably priced;**
- **Participants are highly qualified with 40% of the 2022 papers coming from China, Australia, Canada, Sweden, Japan, Germany, The Netherlands, Poland and Trinidad & Tobago**

The Clearwater Clean Energy Conference

Deadline for Abstracts: Extended to March 15, 2023

CONFERENCE HIGHLIGHTS

The Panels, Short Courses and Technical Sessions cover all the critical technological issues of the day. We are offering both in-person and virtual presentations.

MISSION STATEMENT – Increased demand – coupled with energy security issues, and uncertainty in the oil sector – **make this conference a must for those involved in all aspects of power generation** who must meet the competitive pressures and environmental concerns in the 21st century.

The current Administration continues to bring in many more opportunities for the energy sector. We plan to cover all the proposed programs and policies. As changes and additions occur, we will cover them.

CONFERENCE HIGHLIGHTS

Through the Technical Sessions, Short Courses, and Panels, cutting-edge developments dealing **with technical solutions to problems; specific strategies; projects; innovations; industry trends; and/or regulatory compliance** will be offered. The program presents an extensive overview of emerging, evolving, and innovative technologies, fuels and/or equipment in the power generation industry. We seek papers from all countries worldwide.

International Programs – Technical Developments – Policy Issues

Papers from the international community are strongly encouraged. At the 2022 conference 12 countries were represented at the conference. In addition, one-third of all attendees were from the international community. The international papers were related to energy/environmental developments throughout the world.

PANELS – To provide our attendees with the most comprehensive and up-to-date information from the world's energy leaders, we offer panel presentations covering an overview of emerging, evolving, and innovative technologies, fuels, policy and/or equipment in the power generation industry. These topics are under consideration:

- **Future for Computing,** *Dr. Edmundo Vasquez*
- **Challenges of Converting Biomass to Transportation Fuels,** *Dr. Lawrence Bool*
- **Supplying Critical Minerals for Green Energy,** *Evan Granite, U.S. Department of Energy; Dr. Dave Osborne, Somerset, Australia; and Melanie Mackay, University of British Columbia, Canada*

SHORT COURSES On Sunday, July 23rd, we will offer Short Courses on a wide variety of topics important to the energy community. Participation is optional and is included in the registration fee. The following topics are under consideration:

- Introduction to Natural Gas and Processing
- Introduction to Catalysts and Sorbents
- Introduction to Petroleum Refining
- Overview of Mercury Control Options for Coal-Fired Power Plants
- The DOE Carbon Ore Processing Program

- Rare Earths and Critical Elements in Coal and Coal Byproducts

THEMED LUNCHEON A conference favorite is the Themed Luncheon. Industry leaders host tables of 8 where a specific topic is chosen by the host for discussion during lunch. **To host a table all you need is an interesting topic worthy of discussion.**

FIELD TRIPS Tampa Electric is graciously offering us the opportunity to visit the following facilities.

The Clean Energy Center has the following R&D features:

-**Various forms of solar panels**: flexible rooftop, solar flower, solar tables, floating solar -Avalon AFB3 10 kW / 40 kWh Flow Battery

-**New 50 KW Supercapacitor**

-**1MW(AC) Floating solar demonstration** with 2 types of panels (Canadian bifacial and First Solar Series 6) – largest floating solar plant in FL

- **1 MW Agrivolataic** demonstration project (solar installation complete, agriculture part now in development)

-**Verticle-axis wind turbine**

- The initial stages of designing a **commercial microgrid** incorporating the clean energy components on site

-As well as hiking trails/wildlife viewing tower, kayak trails (possible guided tours), Florida Aquarium Sea Turtle rescue & internationally renowned coral research, Florida Fish & Wildlife Suncoast Youth Conservation Center & Marine Fish Enhancement Center (fish hatchery under construction)

Big Bend Modernization is coming online and represents a repowering of a 1970's era coal boiler to state-of-the art Natural Gas Combined cycle using GE H-class combustion turbines

Southshore Bay Microgrid is a R&D using residential rooftop, battery storage, DC distribution system, and a central energy station (generators & larger batteries) to provide reliable, always-on electricity

EXHIBIT CENTER We are assessing the situation; and if there is sufficient interest, we will offer an Exhibit Center.

BACKGROUND At the direction of the Conference Committee, it was decided to broaden the scope of the conference to include some new and exciting technologies currently on the horizon. Industry professionals representing nearly all the major players in the electric utility industry participated in the **46th Clearwater Clean Energy Conference.**

TECHNICAL SESSIONS

Under the leadership of Conference Committee Co-Chairs *(Dr. Ronald W. Breault, National Energy Technology Laboratory, U.S. Department of Energy; Prof. Ashwani Gupta, University of Maryland; Dr. Lawrence E. Bool, Linde; and Dr. Edmundo Vasquez, Clean Energy Technologies)* industry experts are taking the lead in organizing sessions on topics of the greatest interest to the industry.

CARBON DIOXIDE

CO_2 Novel Approaches

CO_2 Direct Air Capture

CO_2 Point Sources

Andrew Hlasko, U.S. Department of Energy; Dr. Ronald Breault and David Hopkinson, National Energy Technology Laboratory, U.S. Department of Energy; and Brian Higgins, Babcock & Wilcox Co.

CO_2 Conversion and Low Carbon Products

Dr. Aaron Fuller, U.S. Department of Energy; and Dr. Naomi O'Neill, National Energy Technology Laboratory, U.S. Department of Energy

HYDROGEN

Hydrogen Production

Howard Meyer, GTI Energy, and Prof. Subith Vasu, Mechanical & Aerospace Engineering, Center for Advanced Turbomachinery and Energy Research

- **Hydrogen Combustion**
- **Low Combustion Emissions for High H_2 Concentrations**
- **Replacement of Conventional Fuels in the Petrochemical Area**
- **Gas Turbines**

Dr. Marc Cremer, Reaction Engineering Int'l, and Drs. Ronald Breault and Pete Strakey, National Energy Technology Laboratory, U.S. Department of Energy

ENVIRONMENTAL PROTECTION

Ecofuels and

Ecoenergy

Dr. Edmundo Vasquez, Clean Energy Technologies

Eco-Recovery – Liquid/Gas Waste

Klas Andersson, Chalmers University, ***SWEDEN***

Modular Systems for Conversion of Carbon-Based Solids

Jonathan W. Lekse, Dushyant Shekhawat, National Energy Technology Laboratory, U.S. Department of Energy; and Frederick Baddour, NREL

Deriving More Value from Waste – Maximized Utilization of Mined Materials *(Ultimate goal is "Zero Waste" and Maximized Recycling of Water for Re-use)*

- Recovery of Rare Earth Elements and other metals
- Building products and construction materials
- Soil additives and conditioners
- Other products – cements and refractories

Dr. Dave Osborne, Somerset, ***AUSTRALIA*** *and Melanie Mackay, Mining Engineering, University of British Columbia, Vancouver,* ***CANADA***

Net Zero Carbon Emissions
Massood Ramezan, KeyLogic
Emissions
Dr. Edmundo Vasquez, Clean Energy Technologies, and Byron Burrows, TECO
Recovery of Rare Earth Elements
Melanie Mackay, Mining Engineering, University of British Columbia, ***CANADA;*** *Dr. Evan Granite, U.S. Department of Energy and Dr. Dave Osborne, Somerset Coal****, AUSTRALIA***

ARTIFICIAL INTELLIGENCE

Clean and Secure Energy Driven by AI

- AI technologies applied in clean energy, especially in thermal power and wind energy
- The data driven technologies applied in renewable energy, e.g., forecast of wind energy through AI
- Coupling between thermal power plant with renewable energy for safe grid (Longyuan Power, whose major business is wind energy, and Baidu Company who is working on AI for forecasting wind energy to organize this session).

Assoc. Prof. Dr. Wu Yuxin, and Asst. Prof. Dr. Liu Chao, Dept. of Energy and Power Engineering, Tsinghua University, ***CHINA***

V&UQ Technologies with CFD
Assoc. Prof. Dr. Wu Yuxin, Dept. of Energy and Power Engineering, Tsinghua University, ***CHINA***
Machine Learning/Data Analytics-/Digital Twins/Controls
Dr. Lawrence Shadle, National Energy Technology Laboratory, U.S. Department of Energy; and Dr. Robert Hovsapian, National Renewable Energy Lab, and Richard Kephart, Emerson
Machine Learning Approach for Scalability Analysis of Energy Systems
Dr. Rob Hovsapian, National Renewable Energy Network
Methods and approach of ML to improve modeling based on energy systems and enhance the scalability analysis of complex energy systems will be presented. The scalability analysis extends itself to multiple technologies for up-scaling and down-scaling technology characteristics while considering non-linearities for at-scale evaluation. This includes capacity scaling in power and energy conversion devices based on high-fidelity data and physics; and for hydropower, ML representations based on field data from a plant and its use in control prototyping.
Energy Security Issues & Approaches
Dr. Grant R. Johnson, Decision Science, Ames Laboratory and Ben Sooter, Electric Power Research Institute

MODELING

Modeling & Simulation
Dr. Edmundo Vasquez, Clean Energy Technologies

COMBUSTION

Plant Conversions & Fuel Switching
Tom Flynn, The Babcock & Wilcox Co., and Brian Vitalis, Riley Power
Combustion & Gasification Fundamentals
Dr. Ashwani K. Gupta, University of Maryland, and Massood Ramezan, KeyLogic

Pyrolysis & Gasification

Prof. Weihong Yang, KTH Royal Institute of Technology, ***SWEDEN;*** *and Dr. Ashwani K. Gupta, University of Maryland*

PC Fired Units

J.J. Letcovits, Consultant, and Alan Paschedag, Covanta

Natural Gas

Evan Granite, U.S. Department of Energy

Pressurized Oxy-Combustion

Dr. Richard Axelbaum, Washington University in St. Louis, and Dr. Andrew Fry, Brigham Young University

Municipal Solid Waste Combustion

Prof. Lunbo Duan, and Prof. Yueming Wang, Ph.D., Southeast University, ***CHINA***

Biomass Conversion to Power and/or Chemicals

Les Marshall, Consultant, ***CANADA*** *and Josh Stanislowski, UNDEERC*

NH_3 Combustion

Prof. Dongke Zhang, The University of Western Australia, ***AUSTRALIA;*** *Dr. Ronald Breault and Clint Bedick, National Energy Technology Laboratory, U.S. Department of Energy*

NH_3 Energy

Howard Meyer, GTI Energy

Chemical Looping

Dr. Robert Stevens, National Energy Technology Laboratory, U.S. Department of Energy, and Andrew Tong, Susteon

Supercritical CO_2 Brayton Cycles

Dr. Owen Pryor, Southwest Research Institute and Bhupesh Dhungel, Air Liquide

Thermal Management in Advanced Power Generation Systems

Arnab Roy, National Energy Technology Laboratory, U.S. Department

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Sheraton Sand Key, Clearwater, Florida, USA

ABSTRACT REQUIREMENTS

The **ONE PAGE ABSTRACT,** required by **March 15, 2023,** must be submitted via email and include:

- The Proposed Paper with Exact Title and one page of information (no equations and no figures) must summarize the objective and current status of the work; and provide the committee with an accurate scope of the paper. **Please indicate under which Technical Topics this paper falls.**

- Principal Presenter Listing (name, title, company, address, phone, and email). Email addresses are required since this will be the primary mode of communication. Please include Complete Listings for all Co-Authors (name, title, company, address, phone, FAX and email).

The Clearwater Clean Energy Conference does not provide financial support to authors. The registration fee covers one technical paper; authors submitting more than one paper must include an additional $100 per paper.

Notification of acceptance will be made immediately. A manuscript for inclusion in the Proceedings and for distribution on thumb drive (not to exceed 12 pages in length, with illustrative material) is required by **June 25, 2023.**

Instructions for preparation of manuscripts will be sent with letters of acceptance. Presentations will be scheduled in Panels and Technical Sessions, as determined by the Conference Committee. The **ONE-PAGE** abstract should be sent via email to BarbaraSak@aol.com.

Best Student Paper Award – Over the years the conference has benefitted from the many excellent papers given by

The Principal Presenter is the person to whom all correspondence will be sent and who must meet the deadlines and obligations of the conference: making a presentation at the 2023 conference; submitting a manuscript; and paying a conference fee. The non-refundable registration fee of $795 is due before March 31, 2023. There is no reimbursement for time spent or expenses incurred in preparing manuscripts or illustrations, or for transportation to, and expenses at the conference.	students. To give these exceptional students well-deserved recognition, the Conference Committee awards the best paper from a student with the **Clearwater Clean Energy Conference Best Student Paper Award.** The student will be evaluated in the quality of the paper, grasp of the topic presented and quality of the presentation at the conference. The student must be present to win.

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