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**TMS2019**  
 148<sup>th</sup> Annual Meeting & Exhibition

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March 10–14, 2019  
 San Antonio, Texas, USA

**JOIN US FOR THIS TMS2019 SYMPOSIUM:**

**ENERGY & ENVIRONMENT**

**2019 Energy Technologies and Carbon Dioxide Management Symposium**

Since energy is an issue in any branch of industry, this symposium will address the need for sustainable technologies with reduced energy consumption and pollutants and the development and application of alternative sustainable energy to maintain a green environment and energy supply. This symposium is open to participants from both industry and academia and will focus on energy-efficient technologies including innovative ore beneficiation, smelting technologies, and recycling and waste heat recovery, as well as emerging novel energy technologies. The sessions will also cover various technological aspects of sustainable energy ecosystems, processes that improve energy efficiency, reduce thermal emissions, and reduce carbon dioxide and other greenhouse emissions. Contributions from all areas of non-nuclear and non-traditional energy sources are welcomed.

Topics include, but are not limited to:

- Renewable energy resources to reduce the consumption of traditional fossil fuels
- Emerging technologies for renewable energy harvesting, conversion, and storage
- New concepts or devices for energy generation, conversion, and distribution
- Waste heat recovery and other industrial energy efficient technologies
- Energy education and energy regulation
- Scale-up, stability, and life-cycle analysis of energy technologies and improvement of existing energy-intensive processes
- Theory and simulation in energy harvesting, conversion, and storage
- Design, operation, and optimization of processes for energy generation (e.g., carbon capture) and conversion of energy carriers
- Energy efficiency improvement in process engineering (e.g., for biomass conversion and improved combustion) and electrical engineering (e.g., for power conversion and developing smart grids)
- Thermo-electric/electrolysis/photo-electrolysis/fundamentals of PV
- Emission control, CO<sub>2</sub> capture and conversion
- Carbon sequestration techniques
- CO<sub>2</sub> and other greenhouse gas reduction metallurgy in ferrous (iron & steel making and forming), non-ferrous and reactive metals including critical rare-earth metals
- Sustainability and life-cycle assessment of energy systems
- Thermodynamics and modelling for sustainable metallurgical processes

**ORGANIZERS**

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Nearly 4,000 presentations are planned  
 at more than 80 symposia at TMS2019.

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