Special Issue

Process Optimization and Challenges of Hydraulic Fracturing in Energy Systems

Message from the Guest Editors

Hydraulic fracturing has revolutionized global energy landscapes by enabling the large-scale extraction of both conventional and unconventional hydrocarbons, significantly enhancing energy security and economic growth. In recent years, hydraulic fracturing technology has achieved remarkable breakthroughs in fracture control, proppant efficiency, and environmental sustainability. In the context of global energy transition, advancements in hydraulic fracturing that enhance efficiency, safety, and ecological stewardship are crucial in ensuring the future of energy systems. This Special Issue seeks high-quality research addressing fundamental theories, field applications, and emerging solutions in hydraulic fracturing. Topics include, but are not limited to:

- Novel fracturing technologies, fracturing fluids, and proppants;
- Multi-field numerical simulation across scales;
- Real-time monitoring and analysis during fracturing;
- Unconventional gas development in shale, tight sandstone, and coal seams;
- Integration with carbon capture, utilization, and storage (CCUS);
- Water contamination mitigation, water recycling.

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