

# Advanced PSE Stakeholder Summit

## Welcome, Introduction

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*October 11<sup>th</sup>, 2023*



# **Safety Procedures**

# Abridged History...Long ago and far away....

- Chicago 2010 – NETL convenes stakeholders
  - Concept: accelerating technology development with advanced PSE tools integrated to test programs
- **CCSI is born**
  - Carbon Capture technology focus,
  - Existing PSE platforms
- Key capabilities developed...
  - **Multi-Scales**: Integrate simulations across time and space scales
  - **UQ**: Models with built-in Uncertainty Quantification
    - allows identification and focus on key process development needs
  - **SDOE**: Guide development stages to collect most critical information
  - **FOQUS**: Model integration and iteration to allow full system optimization
  - **Surrogates**: Allow complex model outputs to be integrated into entire system models
  - **Gold-Standard Models**: Highly validated full process models for key capture technologies
  - **Dev Speedup**: Multiple test programs deliver most effective data acquisition

# An Entirely New Platform

## Birth of IDAES

- Existing platforms limited in optimization capability
  - Advanced PSE systems, math and algorithm advances open door to create new platform (Equation-Oriented modeling, Python-Pyomo, advanced solvers, MINLP, GDP...)
- Need to address optimum design and integration of broad range of new energy technologies into existing facilities and grids
- IDAES creates
  - New EO-based platform
  - Applications to multiple advanced energy systems
  - Library of operation modules
  - Support for optimizing existing energy facilities
  - Ability to do integrated individual plant/whole system models
  - Much more....

# Applications Beyond Energy

- All process systems can benefit from advanced IDAES and CCSI2 capabilities
  - Integrated energy systems modeling – Dispatches
  - Water purification/desalination – Water Tap
  - Produced water management – PARETO
  - Rare Earth Elements, Strategic Minerals Processing – PrOMMiS
  
  - Each program creating strong focused applications while demonstrating effective workflows, integration with existing capabilities and models useful to all programs
  
  - An Advanced PSE+ Ecosystem and Community

# This Summit

- First time bringing together technical teams, stakeholders, sponsors in all advanced PSE+ programs
- Day 1
  - Morning - Program Leaders Overviews – Key Capabilities and Directions
  - Lunch/Breaks/Dinner – Networking, Partner Meetings, Posters
  - Afternoon – PSE+ Making a Difference: Key Application Examples
  - Stakeholder Panel
- Day 2
  - Parallel Sessions
  - General Session – Advanced capabilities of each program
  - Breakouts – Get involved: Interact with Development Team
    - Demonstrations, Posters, Partner Dialogues, Hands-on opportunities