



Energy Systems Initiative
Center for Advanced Process Decision-Making

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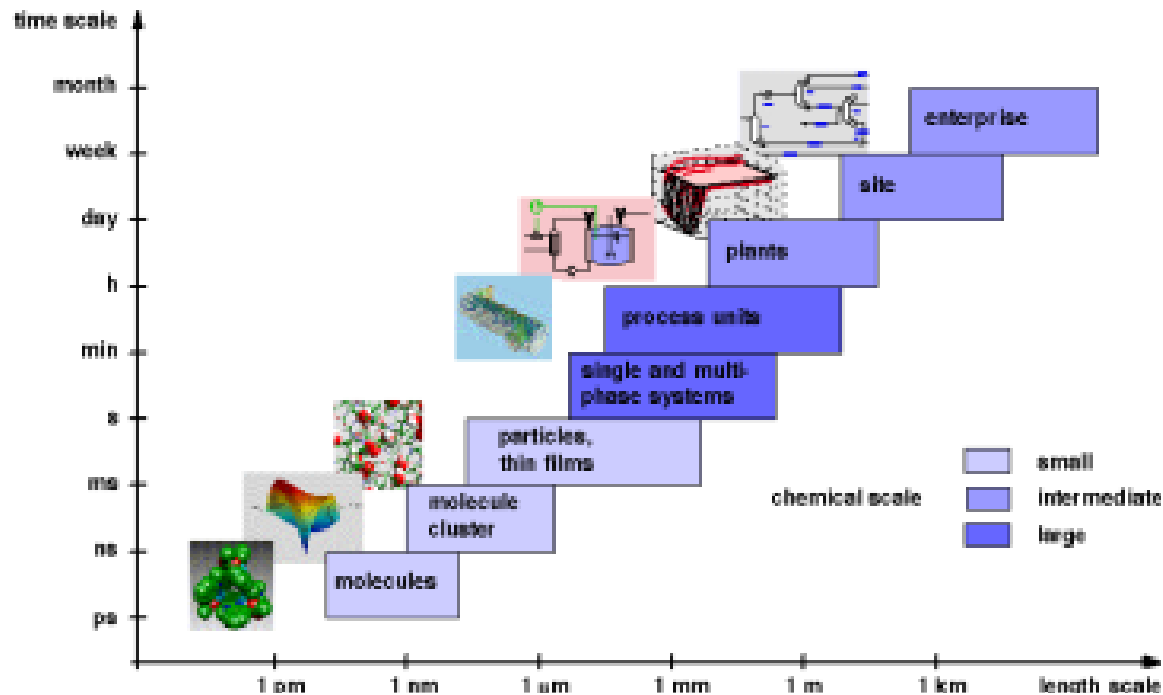
<http://capd.cheme.cmu.edu>

March, 2013

CAPD Goals

Provide intellectual leadership on complex design and operational problems faced by process industries

Science base: optimization, control, computer science, systems engineering, business



Energy Systems Initiative

Objectives

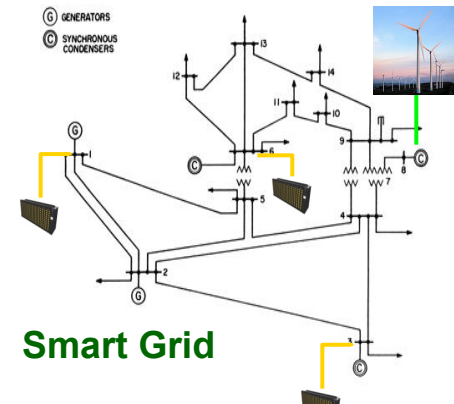
- Accelerate R&D on advanced models, methods, and tools for process systems engineering in energy generation and distribution

ESI Research Areas

- NETL – *Optimization for fossil energy systems, especially for carbon capture, utilization and storage (CCUS)*
- GS E&C – *Optimization of Steam Cycles for Advanced Power Generation*
- MERL - *Optimization in Energy Transportation Networks*
- *Process development, modeling and control for PV solar cells*



CCUS for Power Plants



Smart Grid



PV Solar

Energy Systems Initiative (ESI) Meeting

March 10, 2013

1:30 Introduction	Larry Biegler
1:35 Modeling and Control of Silicon Solar Cells	Erik Ydstie
1:55 Advanced Computational Tools to Accelerate the Development of Next Generation Technologies	David Miller
2:25 Biofuels	Ignacio Grossmann
2:40 Superstructure-based Industrial Wastewater Treatment Network Synthesis	Linlin Yang
2:55 Optimization & Heat Integration in Simulations	Yang Chen
3:10 Optimization Modeling of Energy Processes	Larry Biegler
3:15 Coal Oxycombustion Flowsheet Optimization	Alex Dowling
3:30 Refreshment Break	

Energy Systems Initiative (ESI) Meeting

March 10, 2013

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| 3:45 | Synthesizing an Optimal CO ₂ Membrane Subsystem for Pre-combustion Carbon Capture | Mike Matuszewski |
| 4:00 | Modeling and Optimization of Energy Systems | Nick Sahinidis |
| 4:05 | Strengthened Regression Models through Response Variable Bounds and Constraints | Alison Cozad |
| 4:20 | Permeability Estimation in Heterogeneous Formations with Derivative-free Optimization Based on Observed Data | Yan Zhang |
| 4:35 | Surrogate Model Based Optimal Synthesis of Solid Sorbent Carbon Capture Process | Zhihong Yuan |
| 4:50 | Capillary Theory and Crystallization Modeling for Solar Cell Manufacturing | German Oliveros |
| 5:05 | Discussion and Wrap-up | |
| 7:00 | CAPD Welcome Reception, Wyndham Hotel, 100 Lytton Avenue
(formerly Holiday Inn) | |