

Cross-Cutting Research and Training

Bala Subramaniam, Director
Center for Environmentally Beneficial Catalysis



Kansas Statewide EPSCoR Conference
Lawrence, KS
April 25, 2006

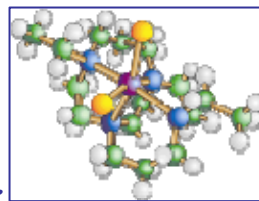


Center for Environmentally Beneficial Catalysis (www.cebc.ku.edu)

*A National Science Foundation Engineering Research
Center since October 2003*



*Designing environmentally responsible
molecules, products, and processes -
from the molecular scale to the plant scale.*



Lead Institution: University of Kansas (KU)

Core Partners: University of Iowa (UI); Washington University in
St. Louis (WUSTL); Prairie View A&M University (PVAMU)

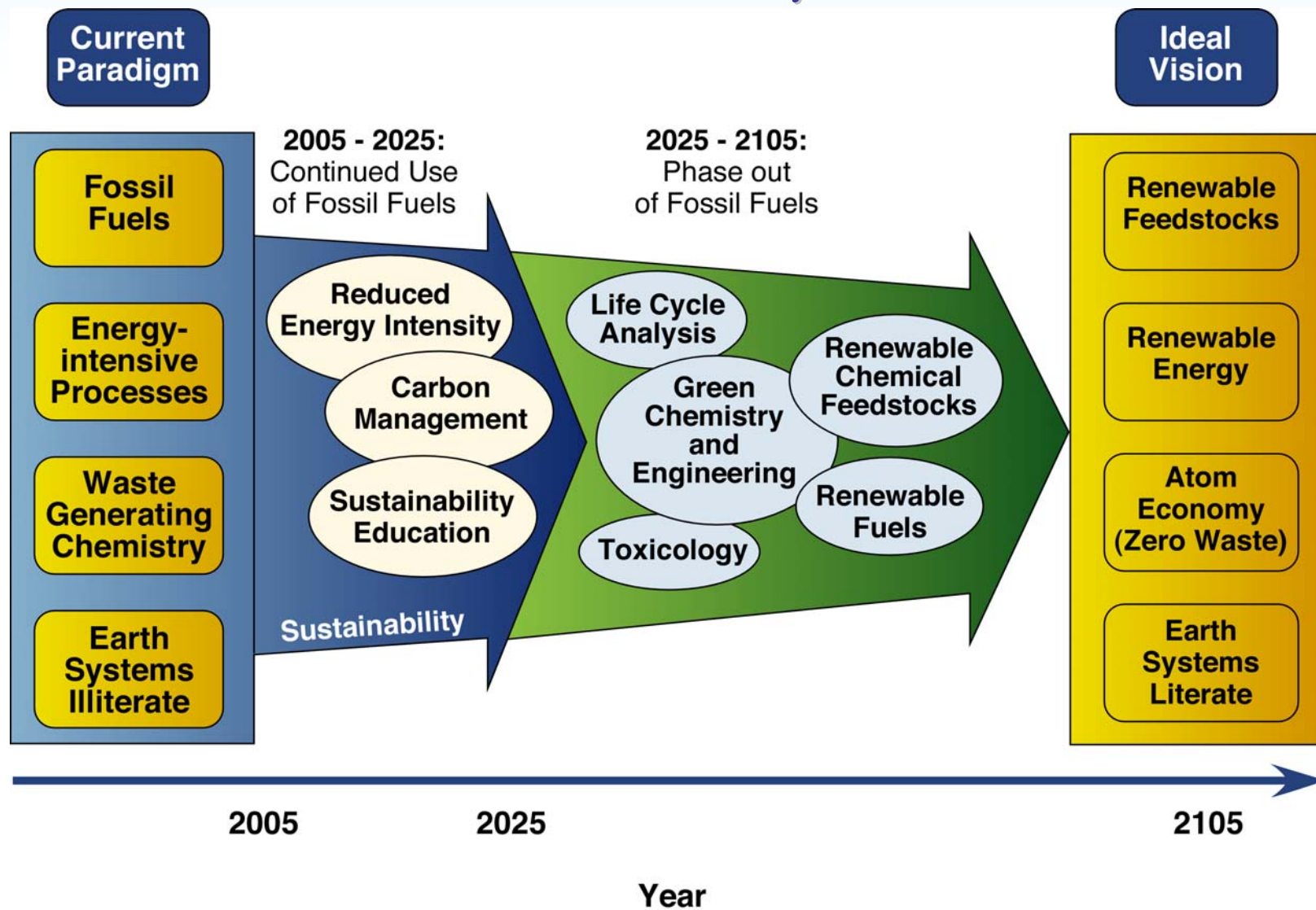
Director: Bala Subramaniam (KU); **Deputy Director:** Daryle Busch (KU)

Associate Directors: John Rosazza (UI); Milorad Dudukovic (WUSTL); Irvin
Osborne-Lee (PVAMU)

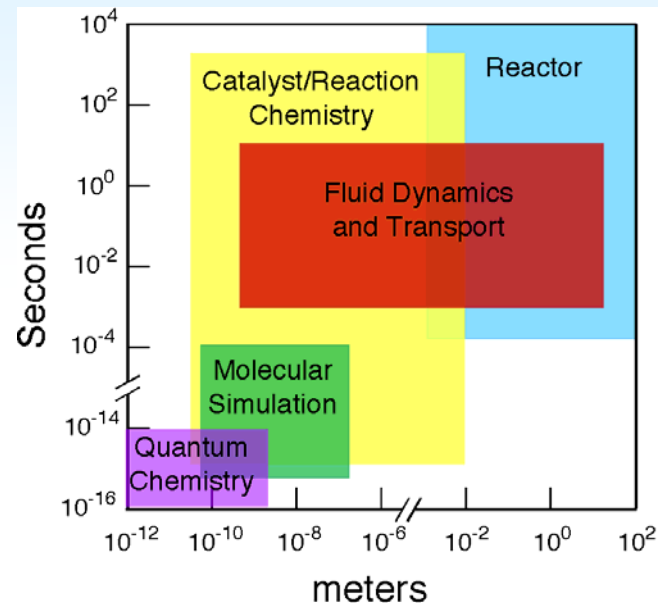
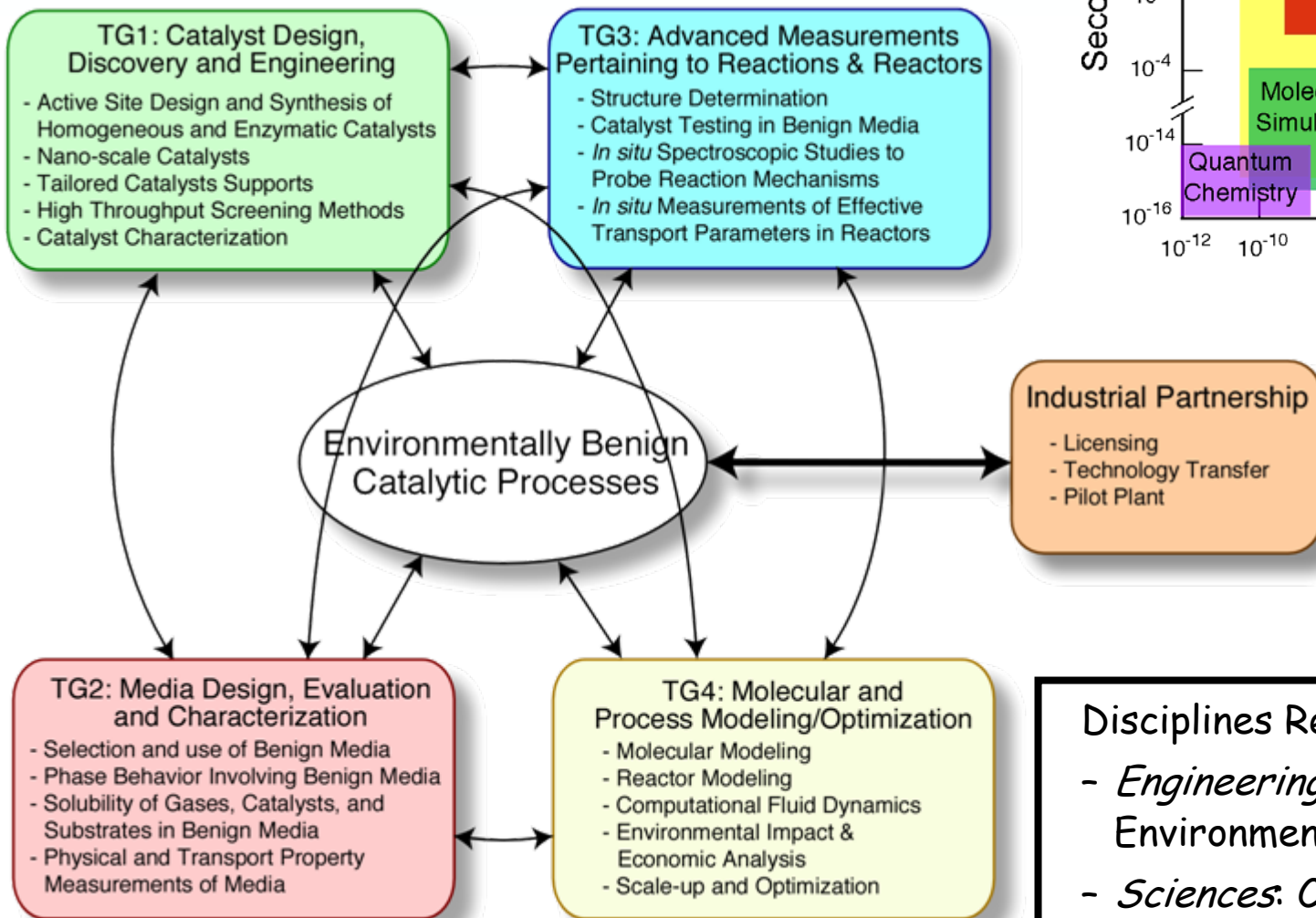
Education Director: Joseph Heppert (KU); **Industrial Liaison:** Darryl Fahey

Sustainability Vision for the Chemical Industry

2005 NRC Report



CEBC Thrust Groups



Disciplines Represented in TGs

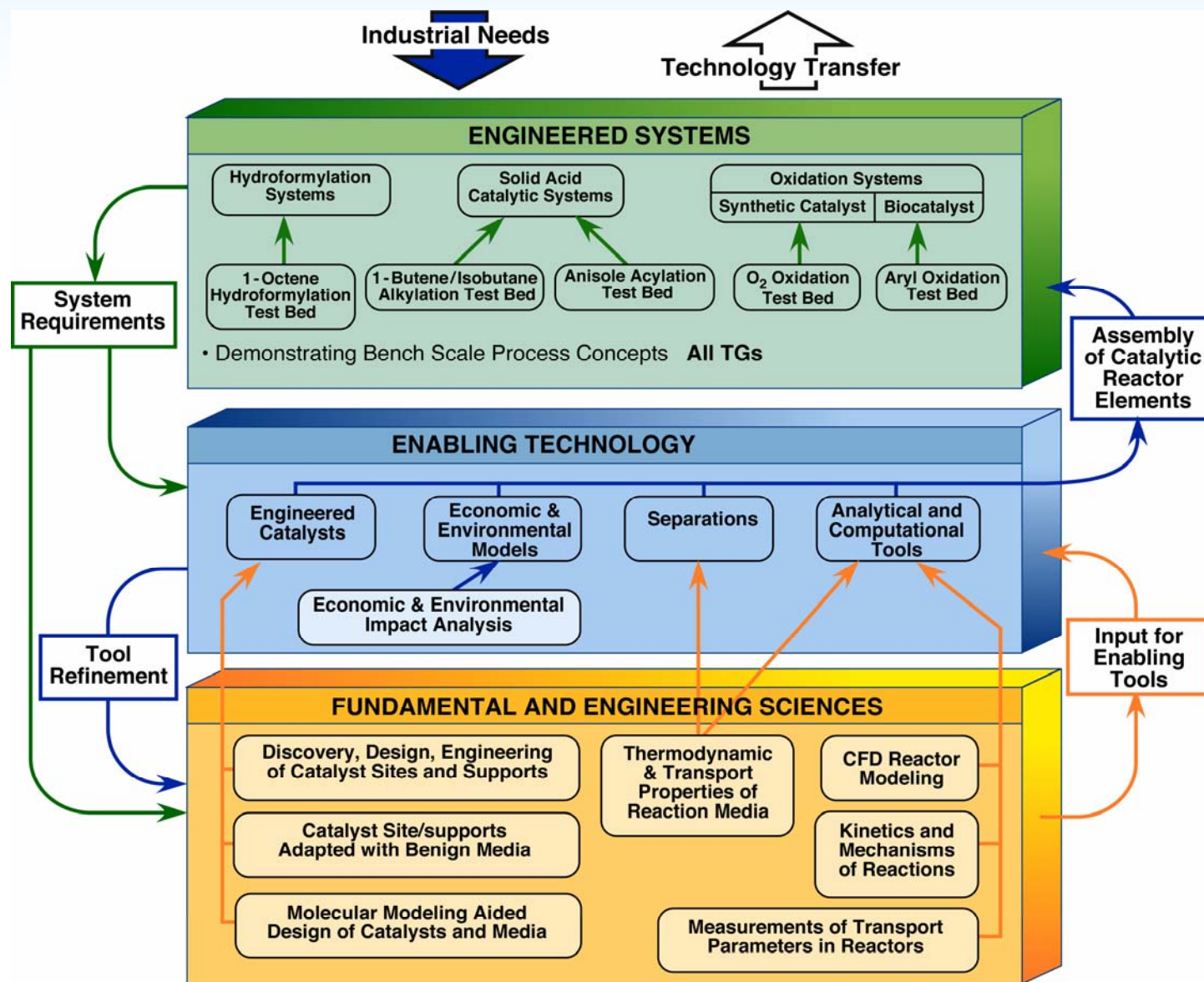
- *Engineering*: Chemical, Civil, Environmental
- *Sciences*: Chemistry, Biology

Current Industry Full Partners (12)

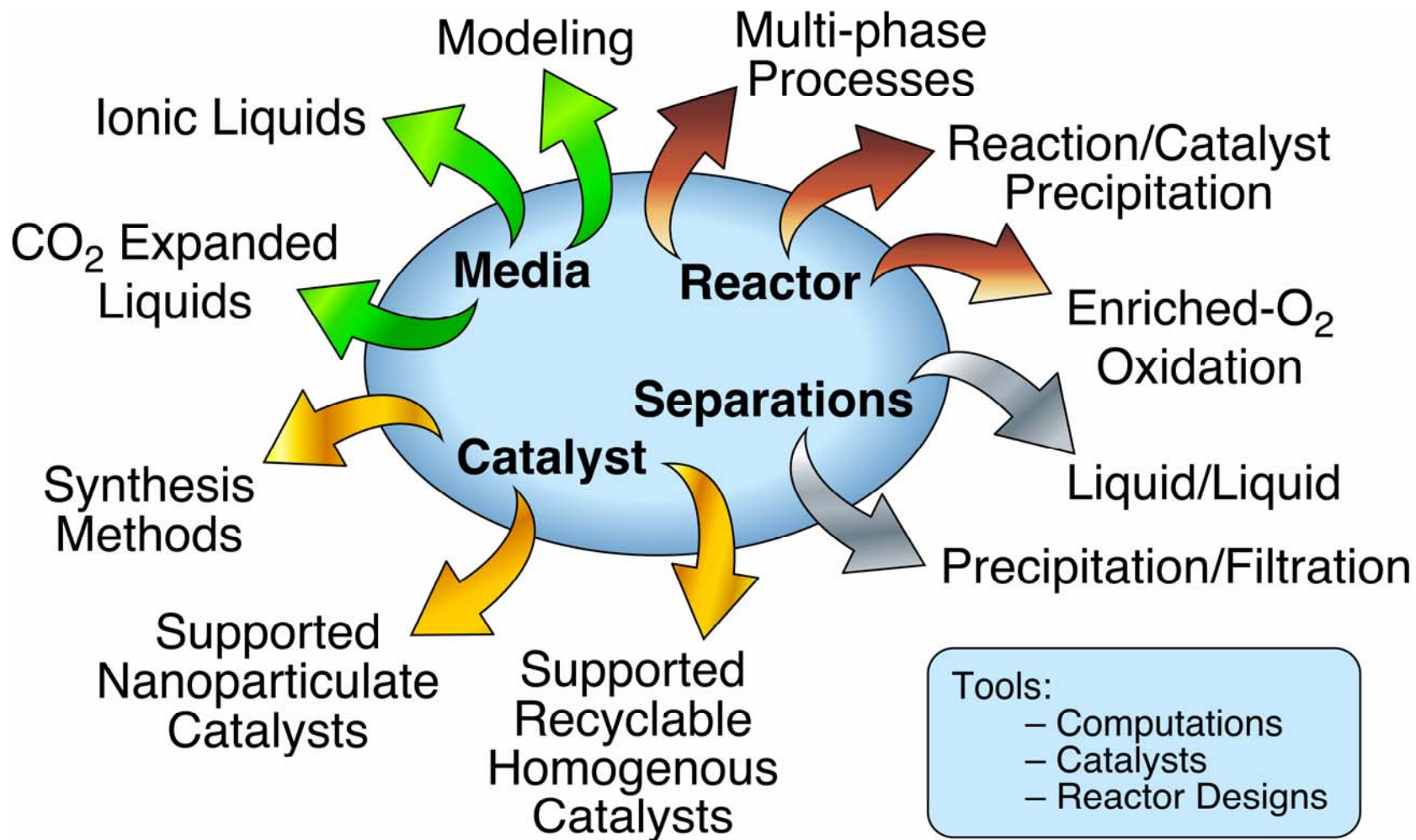
Industry Partner	Areas of Relevance to CEBC
ADM	Crop Processing
BP Chemical	Energy, Chemicals
Chevron Phillips Chemical*	Chemicals and Polymers
ConocoPhillips	Energy
CritiTech (Small)	Pharma Start-up
DuPont*	Chemicals and Biosciences
Engelhard*	Catalysts and Diverse Chemicals
ExxonMobil Chemical	Energy, Chemicals
Kansas Technology Enterprise Corporation (KTEC) (Small)	Corp that promotes tech-based Economic Development
Novozymes	Biotech
Procter & Gamble*	Consumer Products
UOP A Honeywell Company	Technology Supplier to Petrochem Industry

***Charter Member**

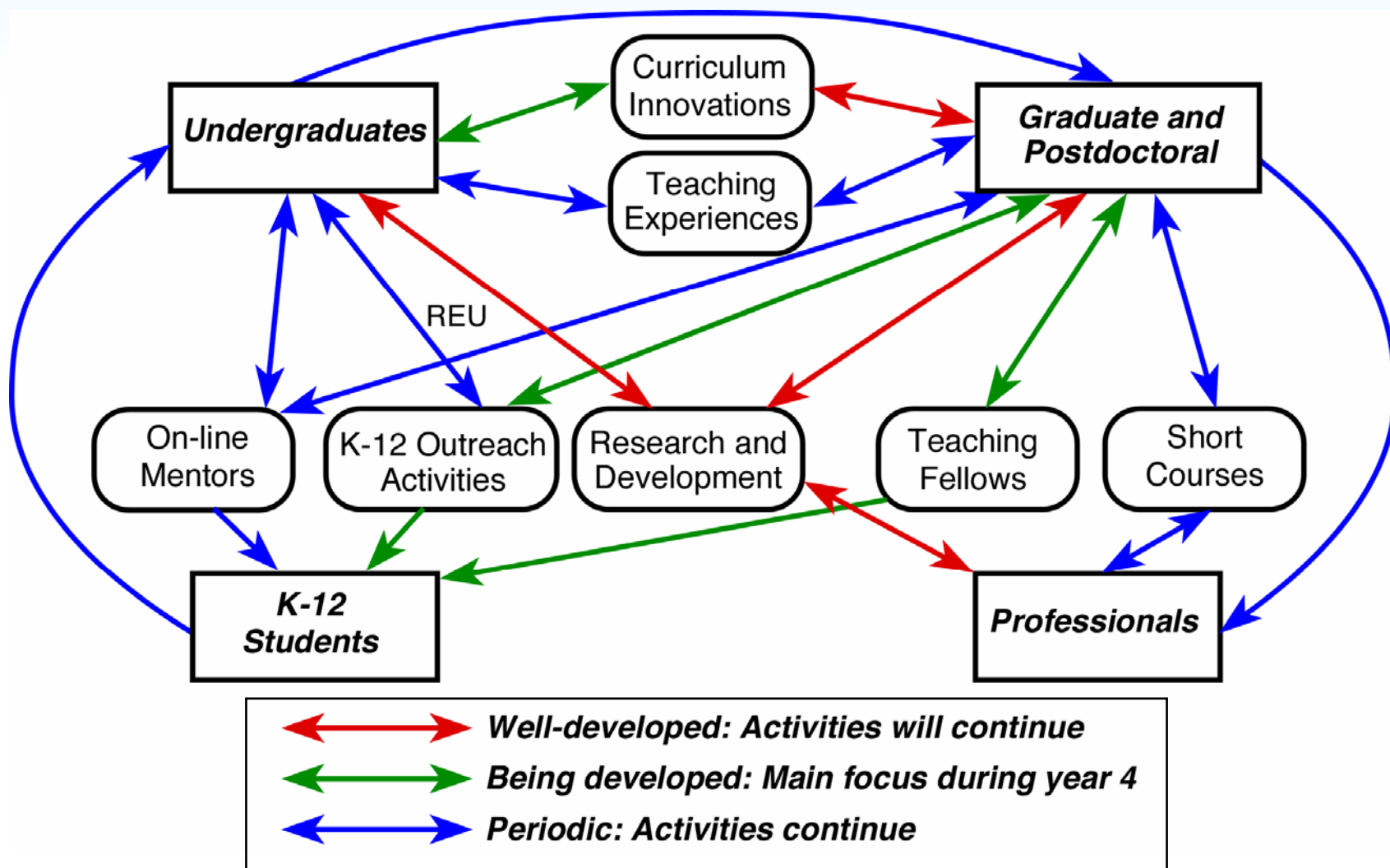
Strategic Research Plan



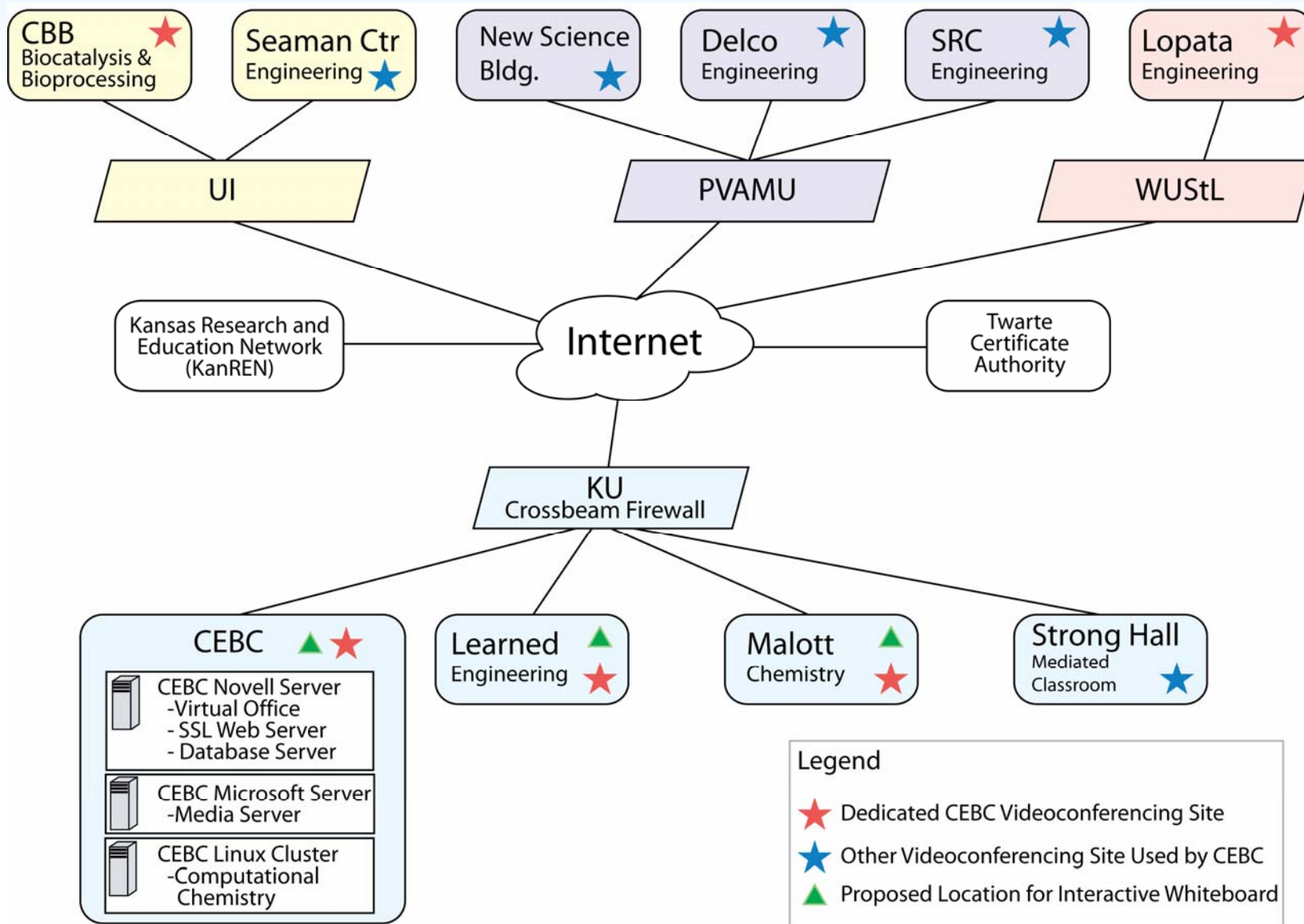
Knowledge/Technology Deliverables From Core Projects



Education and Outreach Programs



Cyberinfrastructure



Assembling Research Teams

- Critical mass of interdisciplinary researchers must exist
 - Mix of senior and junior faculty (core group of ten or so)
 - Kansas EPSCoR program helped nucleate interdisciplinary projects between chemists and engineers in catalysis
- Team Leadership
 - Senior researcher(s) with good reputation and commitment
- Leader(s) organize preliminary sessions
 - Core group should familiarize itself with ERC's unique features
 - Systems-based industry-relevant research
 - Develop a preliminary theme/vision for a center
- Expand Research Team as Needed
 - Identify critical expertise gaps
 - Explore "core" and "flexible" partnerships with other universities

Details of Center Structure and Operation (Who? What? Why? How?)

- Ideation Session(s) with Core Team Members
 - Generate a compelling vision and rationale for center
- Areas of Expertise Needed to Achieve Vision
 - Research thrusts, thrust groups and thrust group leaders
- Develop a Strategic Research Plan
 - Describe process by which “engineered systems” will be developed with industry input and “testbeds”: 3-plane chart
 - Describe how research will be managed and integrated to achieve “engineered system” goals
- Refine Details based on Feedback
 - Organize focus groups involving a group of practitioners and academic researchers including those with ERC experience
 - Meet with ERC Program Officers to discuss proposal

Education, Outreach and Diversity

- Recruit education program director with a proven interest in pedagogical and human resource development matters
- Education/Outreach Strategic Plans
 - Must describe novel curricular, outreach and training aspects that recruit and produce uniquely trained engineers and scientists
 - Ideally, every center faculty must be involved in some (but not all) components of program (K-PhD and Life-long Learning)
 - Full-time education program coordinator desirable to coordinate logistics and assessment of multi-campus activities
- Diversity Strategic Plan
 - Form Diversity Advisory Board to help with planning and contacts
 - Must include targets for recruitment
 - Partnerships/linkages with minority serving institutions and organizations

Institutional Financial/Space Requirements

- Proposal Preparation Phase
 - Seed funds
 - To hire program assistant(s) to assist leader(s)
 - Industrial Liaison Coordinator
 - Consultants
 - To organize industry focus group meetings
- Commitments for Proposal
 - Headquarters space for administration, special research facilities, and industry projects
 - Cash match requirements
 - New faculty positions including startup packages
 - Cyberinfrastructure (video conferencing and class room facilities)