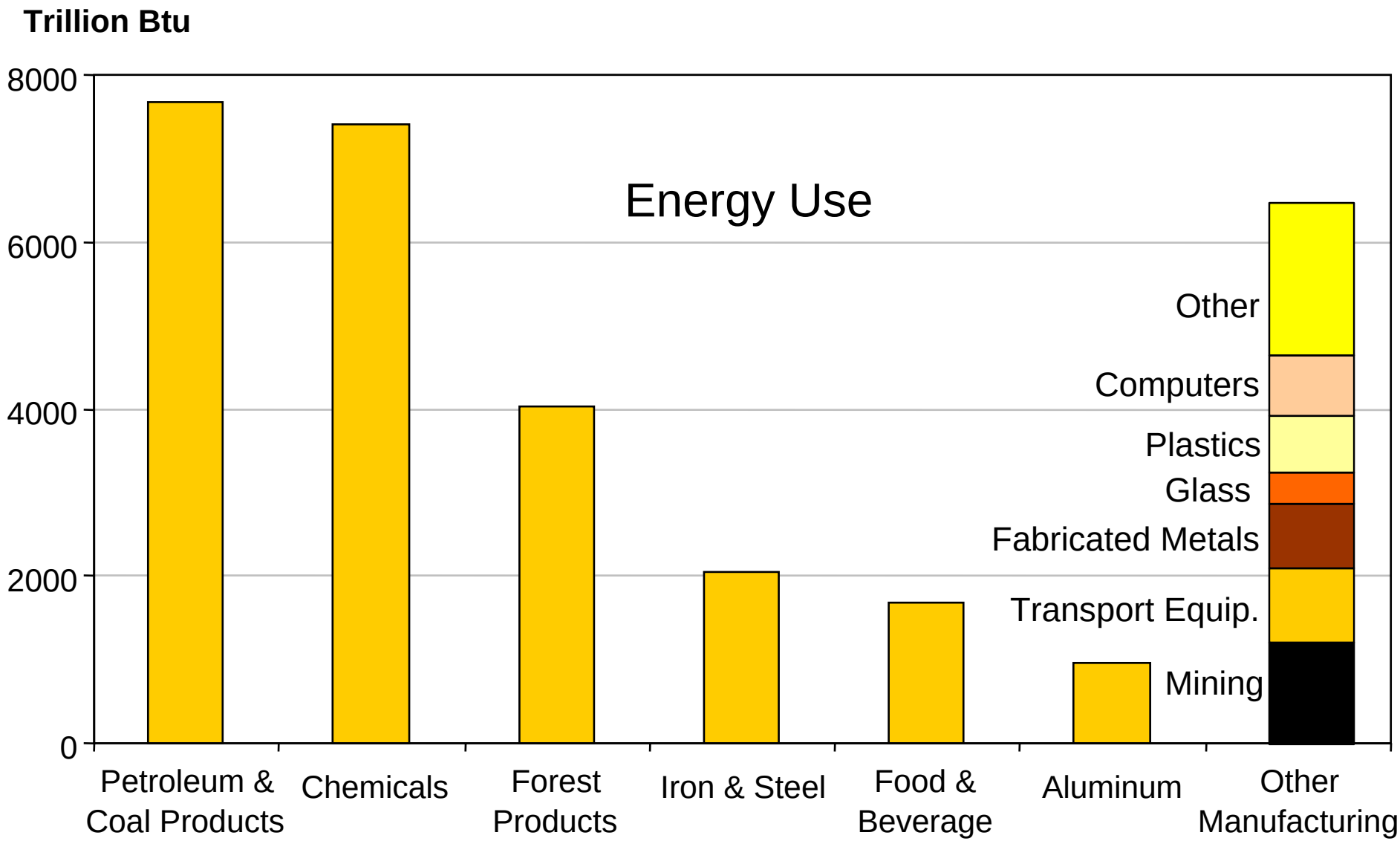
Support of Vision 2020 Innovative Energy Systems Challenge

Presented By:
John Cuttica
Energy Resources Center
University of Illinois at Chicago

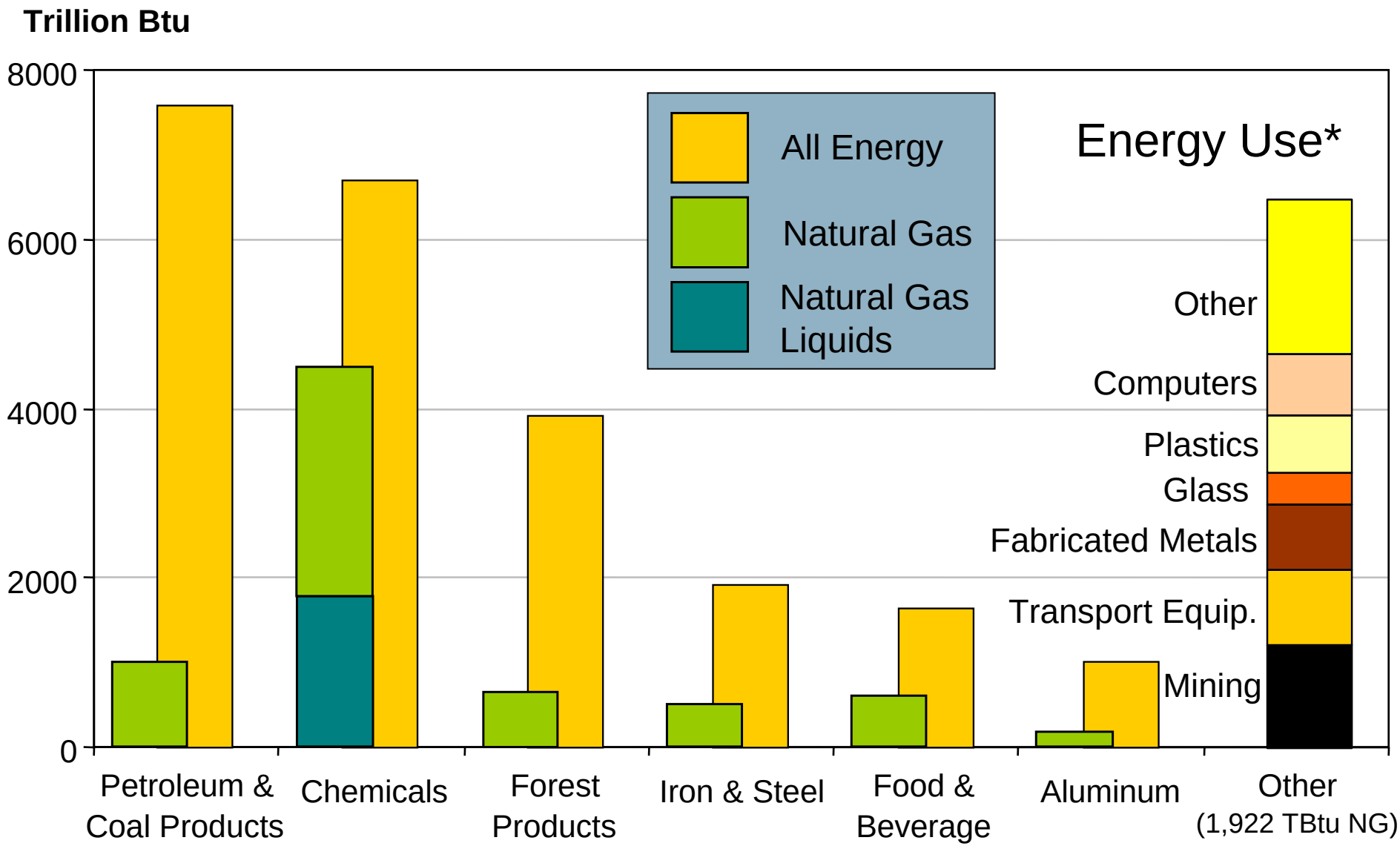
Importance of the Chemical Industry

- U.S. is the largest chemical producer in the world
- 26% of the world production
- $454 billion in chemical shipments (2001)
- 2% of the total U.S. GDP
- Nearly 12% of the U.S. manufacturing GDP
- After-tax profits of $45 billion (2001)

Industrial Segments with Highest Energy Use



Industry Segments with Highest Energy Use



Source: 1998 Manufacturing Energy Consumption Survey (MECS)

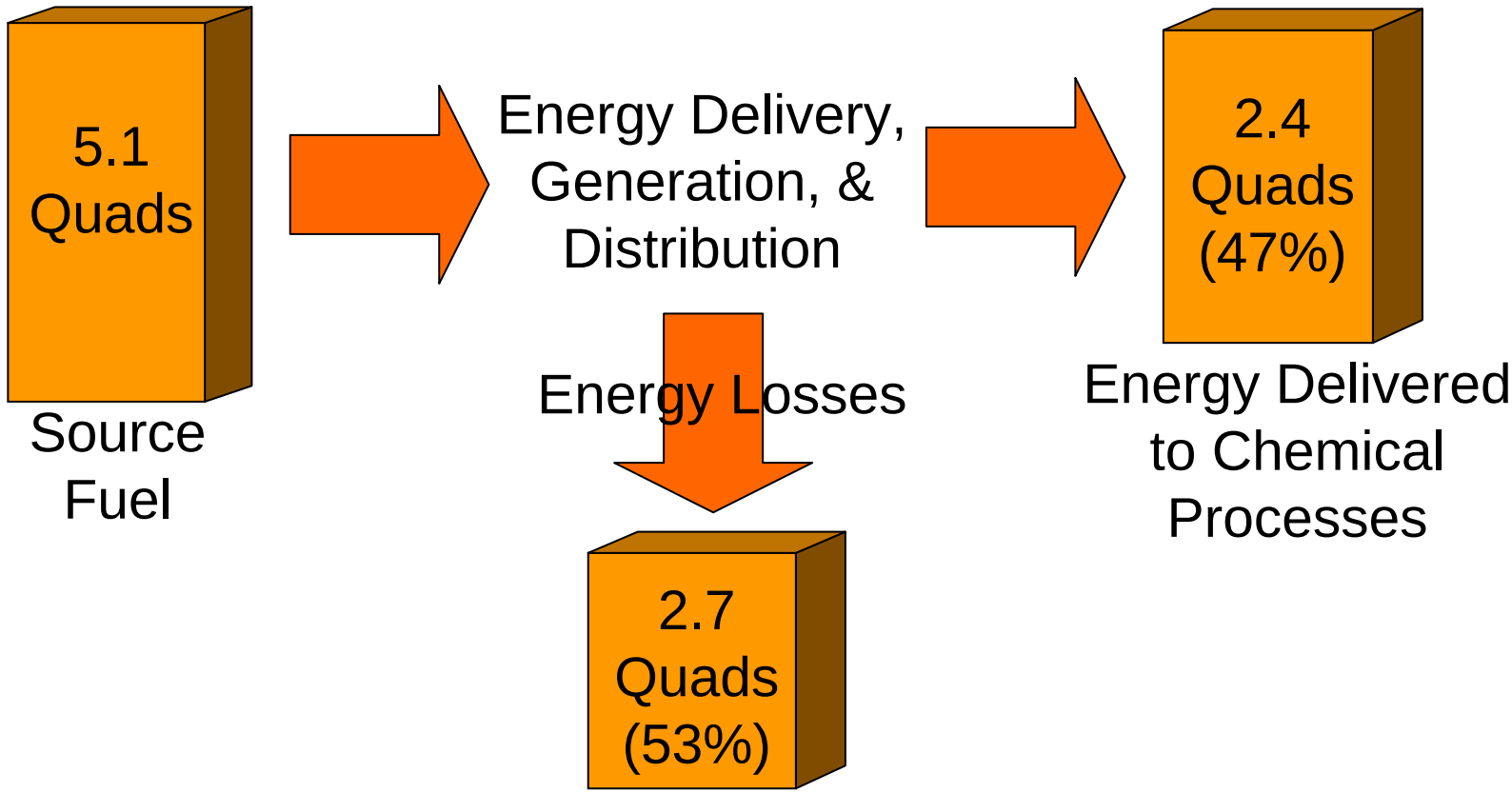
* Includes electricity losses

Chemical Industry Vision 2020 Technology Partnership

- An industry-led collaborative process to accelerate innovation and technology development in the chemical industry by leveraging financial resources and technical expertise.

- U.S. Department of Energy (Industrial Technologies Program) – Key Government Supporter

Current Chemical Industry Energy Situation



Source: MECS 1998

6

Innovative Energy Systems Challenge Project Goals

- Target the energy losses (2.7 Quads) not directly associated with proprietary chemical processes
- Stimulate innovative technology solutions that can widely impact the chemical industry and collectively achieve a cost-effective 30% reduction in energy losses by 2020
- Significantly advance technology and/or cost improvements over present state-of-the-art practices

7

Project Approach

- 5 year collaborative pilot project
- 5 to 8 multi-year R&D contracts anticipated from the Phase I solicitation
- 27 trillion Btu (1% of goal) long term potential for any one technology proposed
- DOE Phase I planned commitment up to $4 million over a several year period (12 to 24 months)
- Phase I efforts to result in “proof of concept”
- Anticipate a down-select from 5 to 8 projects down to 2 to 3 projects for Phase II

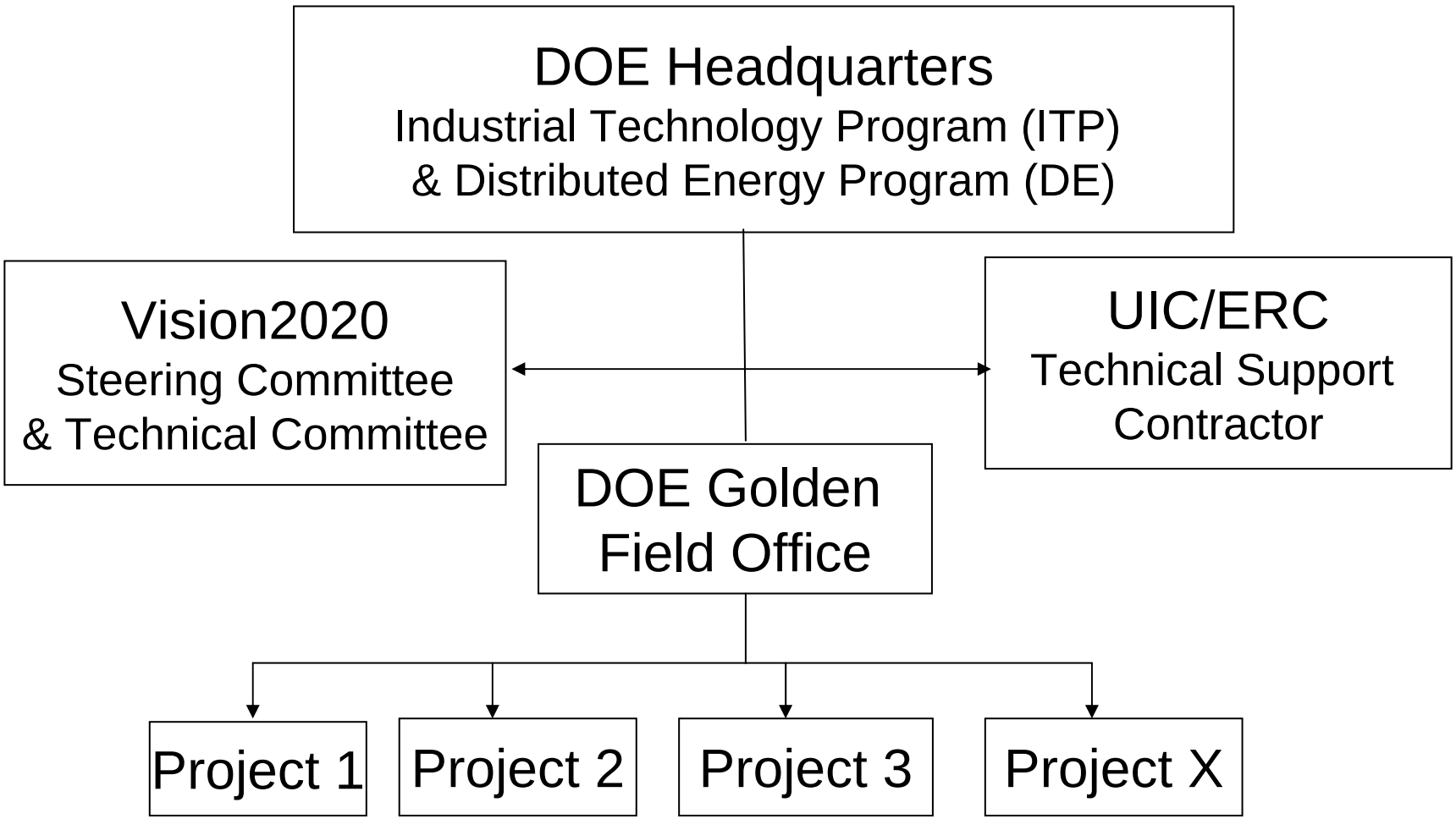
8

Project Approach (continued)

- Phase II efforts will include final engineering development, demonstration, and commercialization
- Phase II efforts will require a chemical industry partner (installation and test at their facility)
- R&D contracts require a minimum of:
  - 20% non-federal cost share for Phase I
  - 80% non-federal cost share for Phase II

9

Innovative Energy Systems Project Organization



Innovative Energy Systems Technology Categories

- **Energy Conversion** – *transforming energy to useful work (steam, heat, cooling, motor drive, mechanical drive); may be closely integrated with the industrial process.*
- **Waste Heat Recovery** –*recovering energy embodied in exhaust gases or liquids, flue gases, or other waste or byproduct energy sources, including combustible byproducts.*
- **Crosscutting / System Integration** – *energy systems and auxiliary components that are integrated with the industrial process to improve overall energy efficiency; examples include sensors and controls; innovative integration of power or distribution systems; energy integration schemes; or ways to improve energy export, such as interplant heating, cooling and power-sharing*.

Innovative Energy Systems Project Plan

Timeline

12

Innovative Energy Systems Project Plan

Timeline Over Project Duration (next 12 to 36 months)

Monitor Progress – Periodic Meetings & Annual Peer Reviews

Conduct Workshops to Foster Project Integration

Develop Commercialization Plans

Foster Technology Demonstrations

13

Project Development Concept

- Integrate commercialization early into the R&D process
- Foster ownership by industry stakeholders at the R&D stage
- Demand stakeholders test / demonstrate / commercialize results in their plants
- Work toward stated industry goals
- Seek State / Regional partnership to make this happen

Questions / Discussion