

## CEE 4th Annual Industry Partners Meeting

# Data Centers & Servers Track – Savings through Improving Server Utilization & Managing Data Storage

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Wednesday September 26, 2007



Figure 1 The National Energy Research Scientific Computing Center (NERSC) operated by LBNL

# Track Agenda

- Introduction
- Panel Presentations (11:00 - 12:30)
- Lunch (12:30 – 1:30 pm)
- Questions, Discussion & Brainstorming (1:30 – 2:45)
- Re-cap (2:45 – 3:00)

# CEE Background

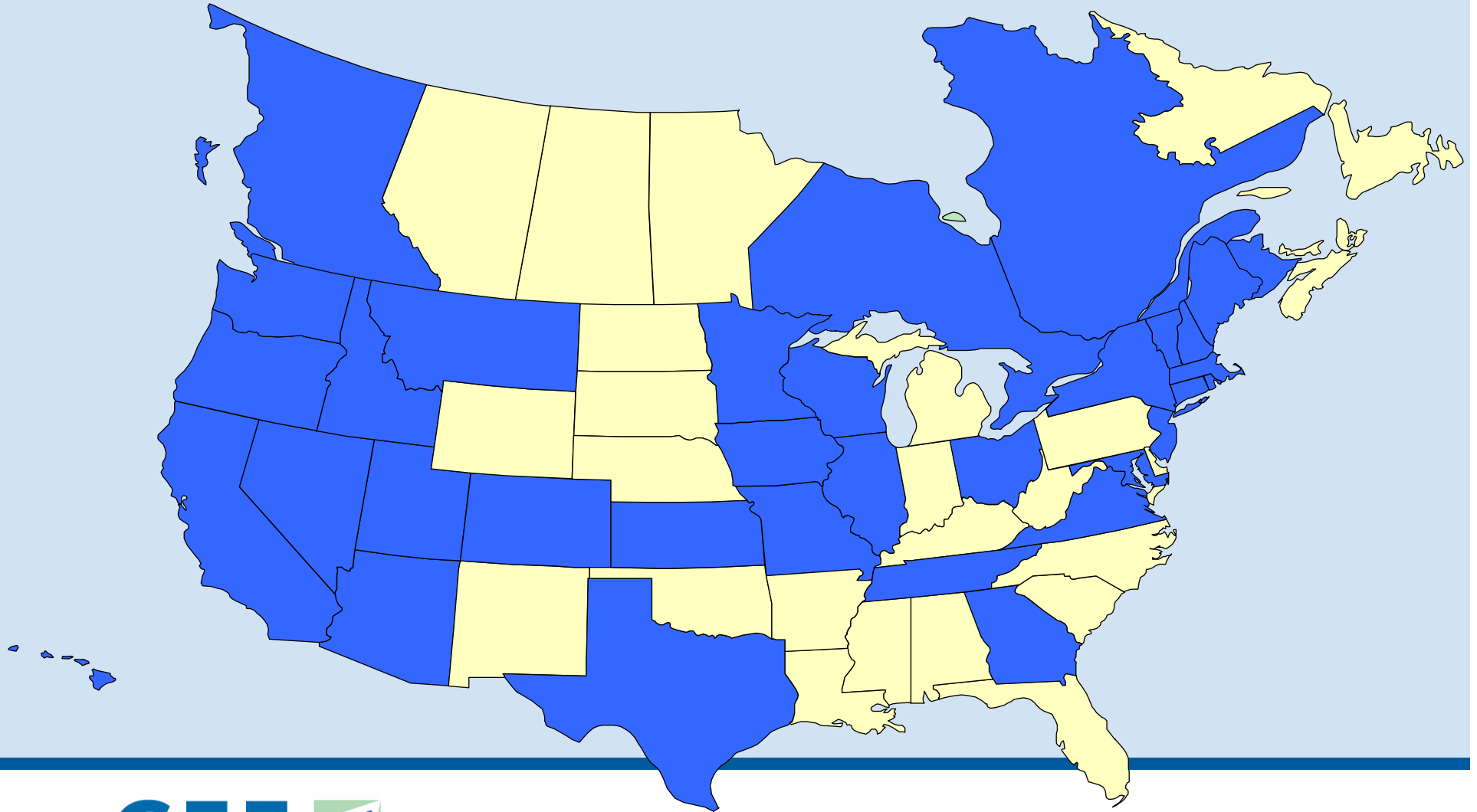
- **Founded:** 1991 as a 401c(3) nonprofit
- **Growing:** 80 + members, reaching over 50% of the U.S. population and over 1/3 of Canadians
- **Program spending:** Over \$2 billion in '06, growing
- **Sponsoring:** 14 North American initiatives, 20 + active committees
- **Pursuing:** Numerous emerging opportunities



Working Together, Advancing Efficiency

# CEE Members

As of September 2007



Working Together, Advancing Efficiency

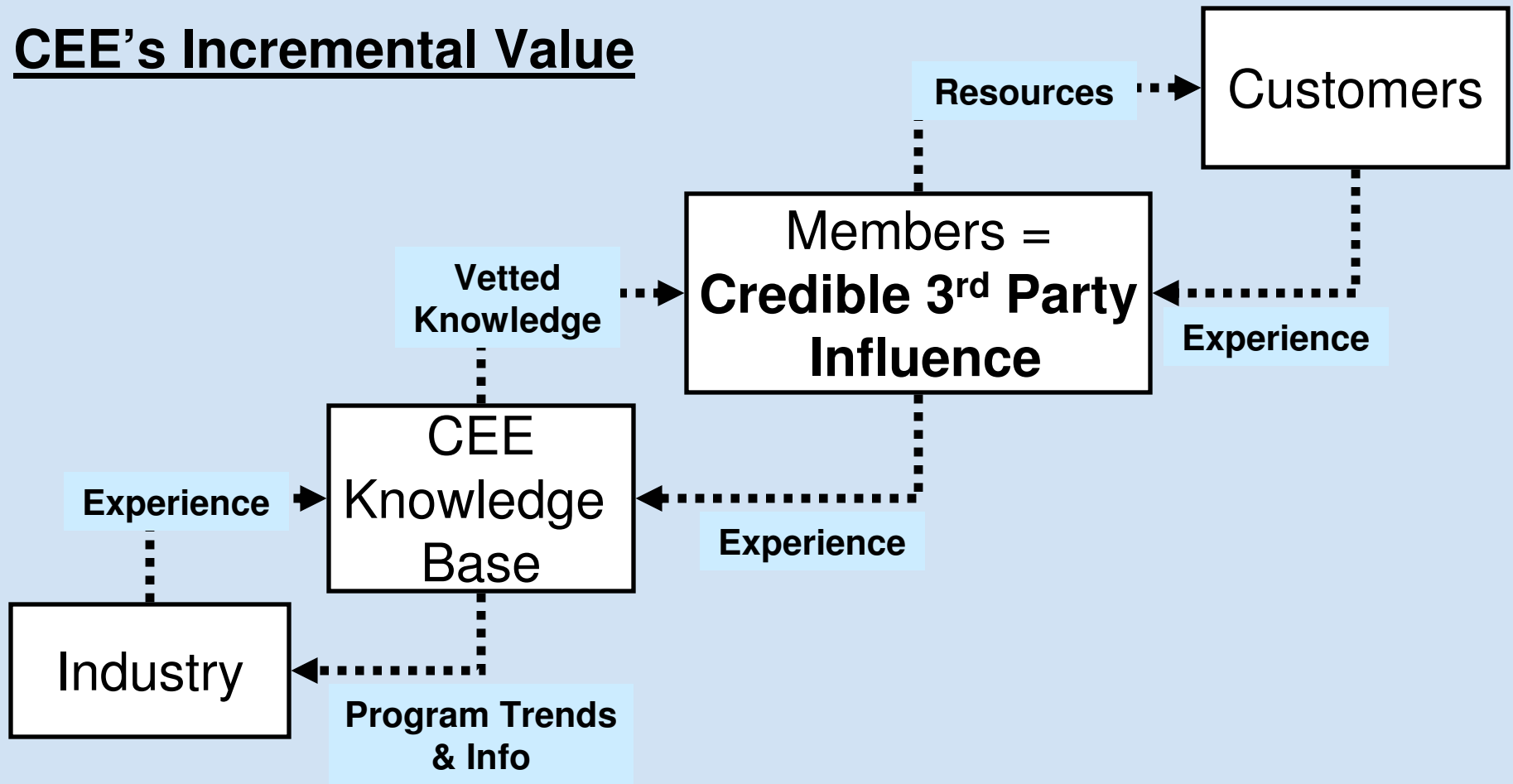
# CEE Background



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# CEE Background

## CEE's Incremental Value



# CEE Data Centers & Servers Initiative

## Objectives:

- ✓ Facilitating our industry's collective understanding of the market players and industry motivations
- ✓ Developing & supporting consensus-based definitions and performance specifications
- ✓ Identifying recommended program strategies to help move more of the market to a preferred outcome



# CEE Data Centers & Servers Initiative

## Scope:

	Technology Lens	
	System/ End Use	% DC Energy Consumption
IT Systems	Servers	40%
	Storage & network equipment	10%
Facilities Support Systems	Cooling	25%
	Power distribution	11%
	Other infrastructure	14%

Energy Management Lens
✓ Data center benchmarking
✓ Design support
✓ Operations & maintenance
✓ Energy Awareness
✓ Procurement of efficient systems, products

# CEE Data Centers & Servers Initiative

Work Area	Description
<b>Improve Server Efficiency &amp; Utilization</b>	<b>Promote high efficiency server equipment</b> (support development of voluntary server performance specifications) <b>Server consolidation--virtualization</b> (understand energy savings opportunities of server utilization and potential program strategies)
<b>Improve other IT System Efficiencies</b>	<b>Data storage system improvements - massive array of idle disks (MAID)</b>



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# CEE Data Centers & Servers Initiative

## Today's Scope:

### Data Center EE Opportunities

#### IT Equipment

- ✦ Servers
- ✦ Storage
- Network

#### Facilities Systems

- Thermal management
- Power distribution

# Session Objectives

- Discuss software solutions that improve server utilization and data storage power management
- Discuss energy savings across different applications
- Market acceptance, penetration and barriers of these technologies
- Understand industries' work to create prerequisites for accepted virtualization benchmarks
- Discuss potential CEE roles, brainstorm energy efficiency program options

# Panel Presentations

- **Rob Smoot, VMWare** - Understanding Virtualization & Efficiencies from Increasing Server Utilization
- **RK Hiremane, Intel** - Industry Efforts to Develop Common Virtualization Performance Specifications
- **Aloke Guha, Copan Systems** - Understanding Efficiency Opportunities in Data Storage (Massive Array of Idle Disks)

# Discussion Questions

- What are the important conditions and applications where virtualization can have optimal (energy) impact? MAID?
- What are unique role(s) of CEE and programs in helping to bring about these optimal impacts?
- Keeping in mind usefulness to energy efficiency programs
  - Easily understood, clarity in the market, simplicity, actual and real energy savings
- What foundational elements are already in place?  
What is missing?