



The Second U.S.-China Energy Efficiency Forum



Lawrence Berkeley National Laboratory

Realizing Building End-Use Efficiency with Emerging Technologies

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What is End-Use Efficiency (EE)?

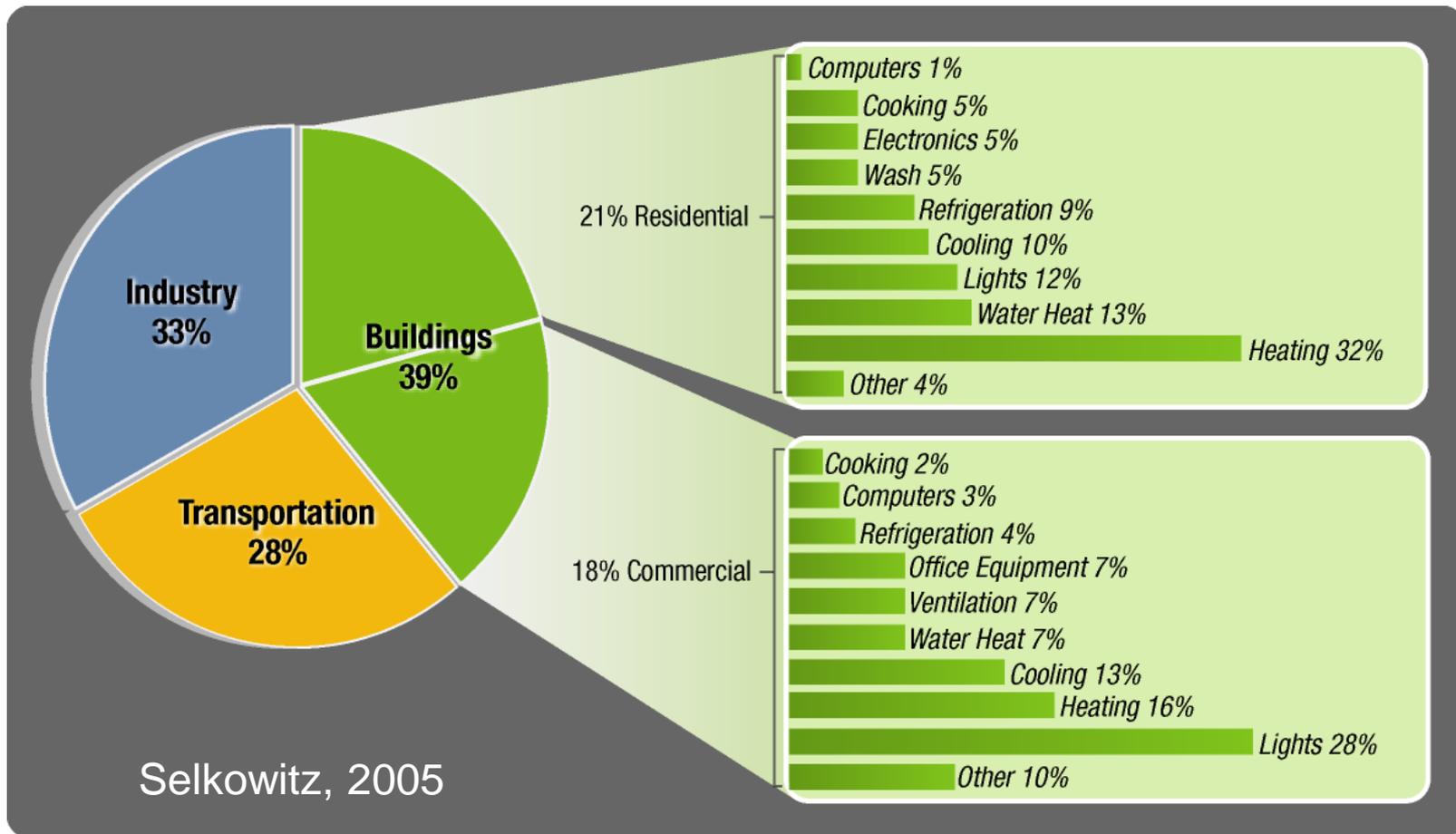
- EE is an energy resource
- Broadly accepted in the U.S. as the single most effective step toward reducing pollution, power costs and price volatility
- Treated as equivalent to supply-side resources
- Recognized by states and regions as first priority when costs are comparable (CA, MO, NM, Pacific Northwest)

The Northwest Power Act 839b(e)(1). The plan shall, as provided in this paragraph, give priority to resources which the Council determines to be cost-effective. Priority shall be given: first, to conservation; second, to renewable resources; third, to generating resources utilizing waste heat or generating resources of high fuel conversion efficiency; and fourth, to all other resources.

Buildings are the largest U.S. energy user

Buildings consume 39% of total U.S. primary energy

➤ *71% of electricity and 54% of natural gas*



Selkowitz, 2005

EE programs target building systems to “generate” efficiency

Lighting & lighting controls

Building components

HVAC & controls

Building shell

Water heating including solar DWH

Zero net energy buildings

Electronics / plug load

Motors & drives

High-efficiency & smart appliances

Industrial process improvements

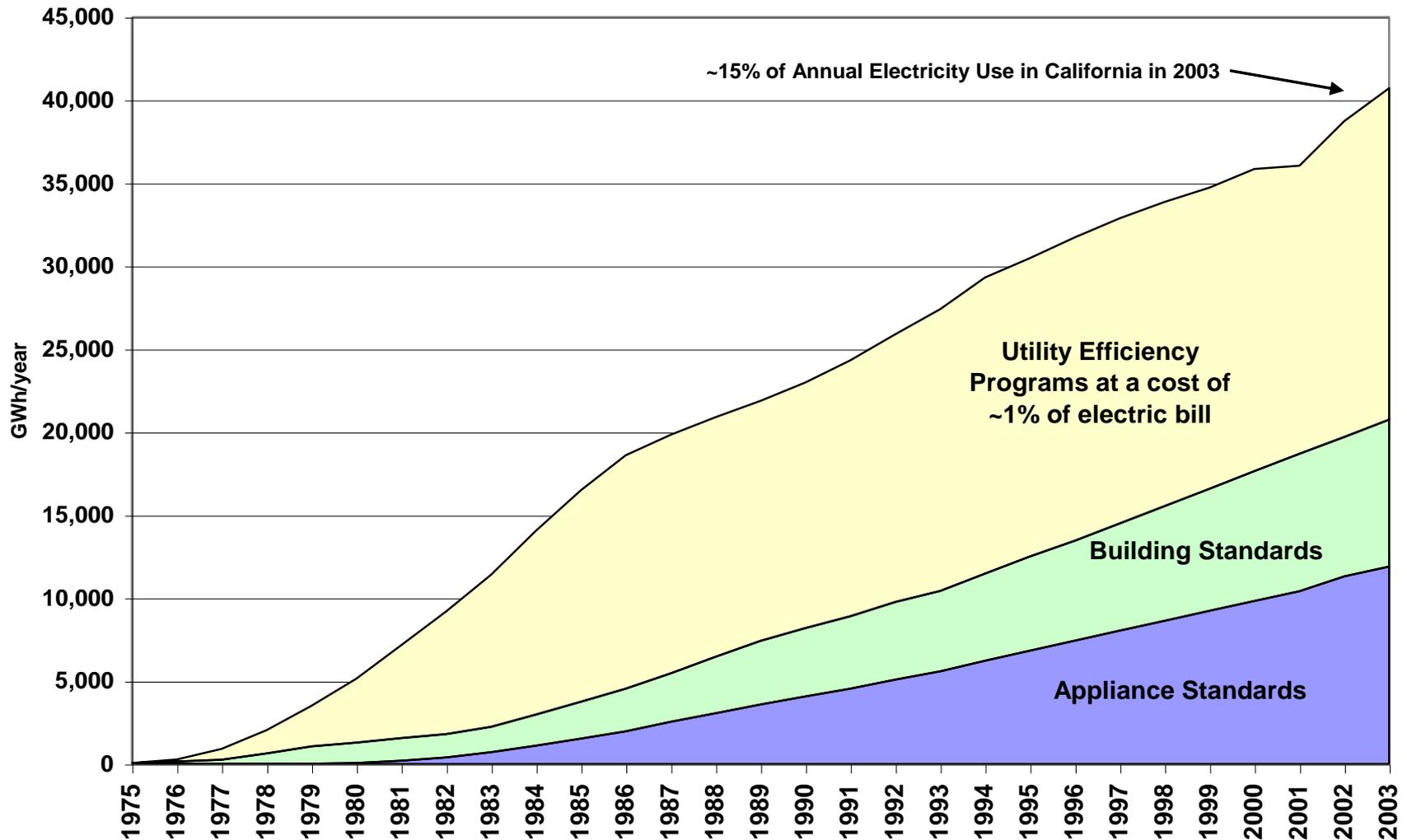
Energy measurement, display & controls

Sector-specific system solutions

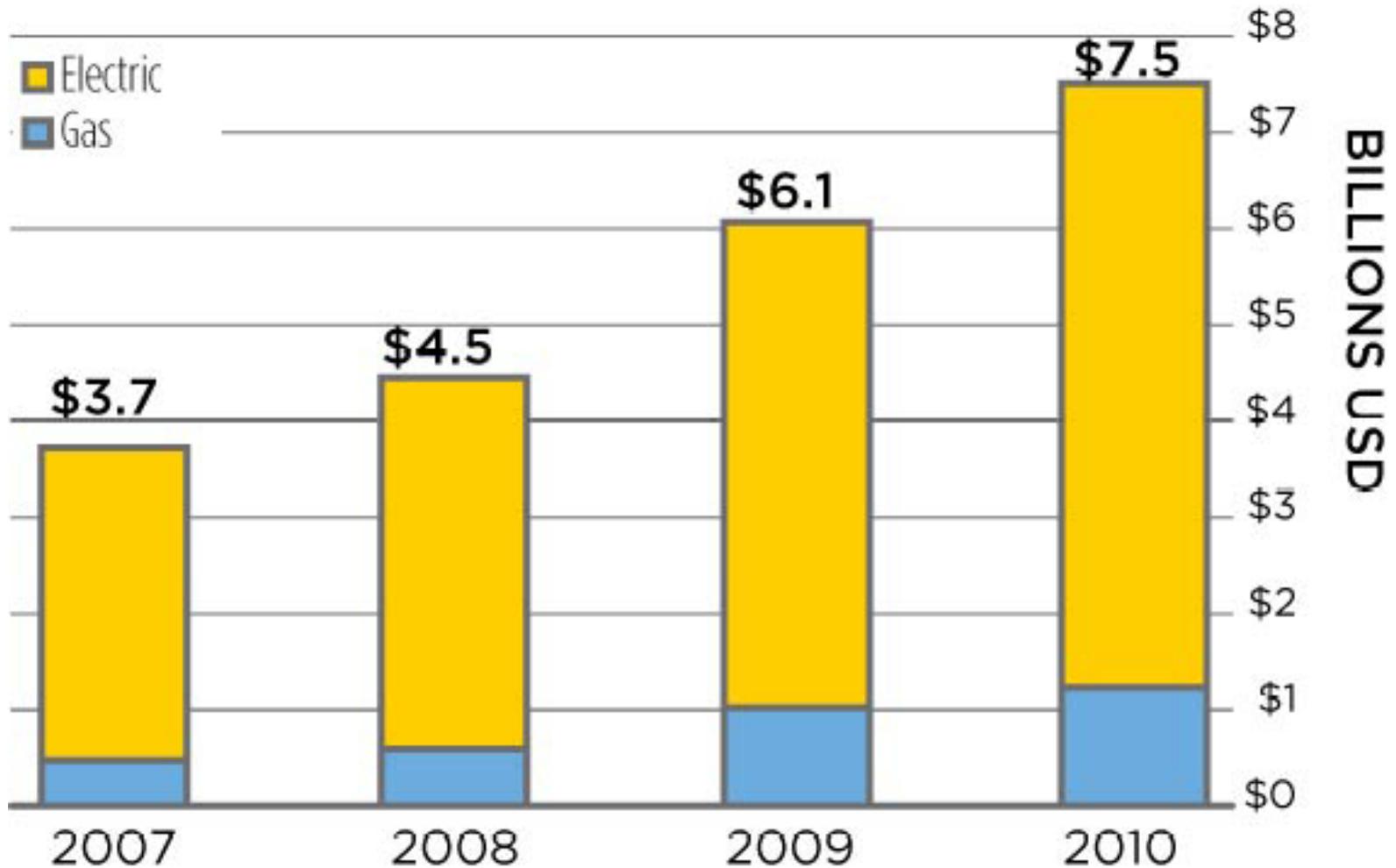
Energy efficiency services

Basic science

Utility EE programs work best in tandem with building codes & appliance standards

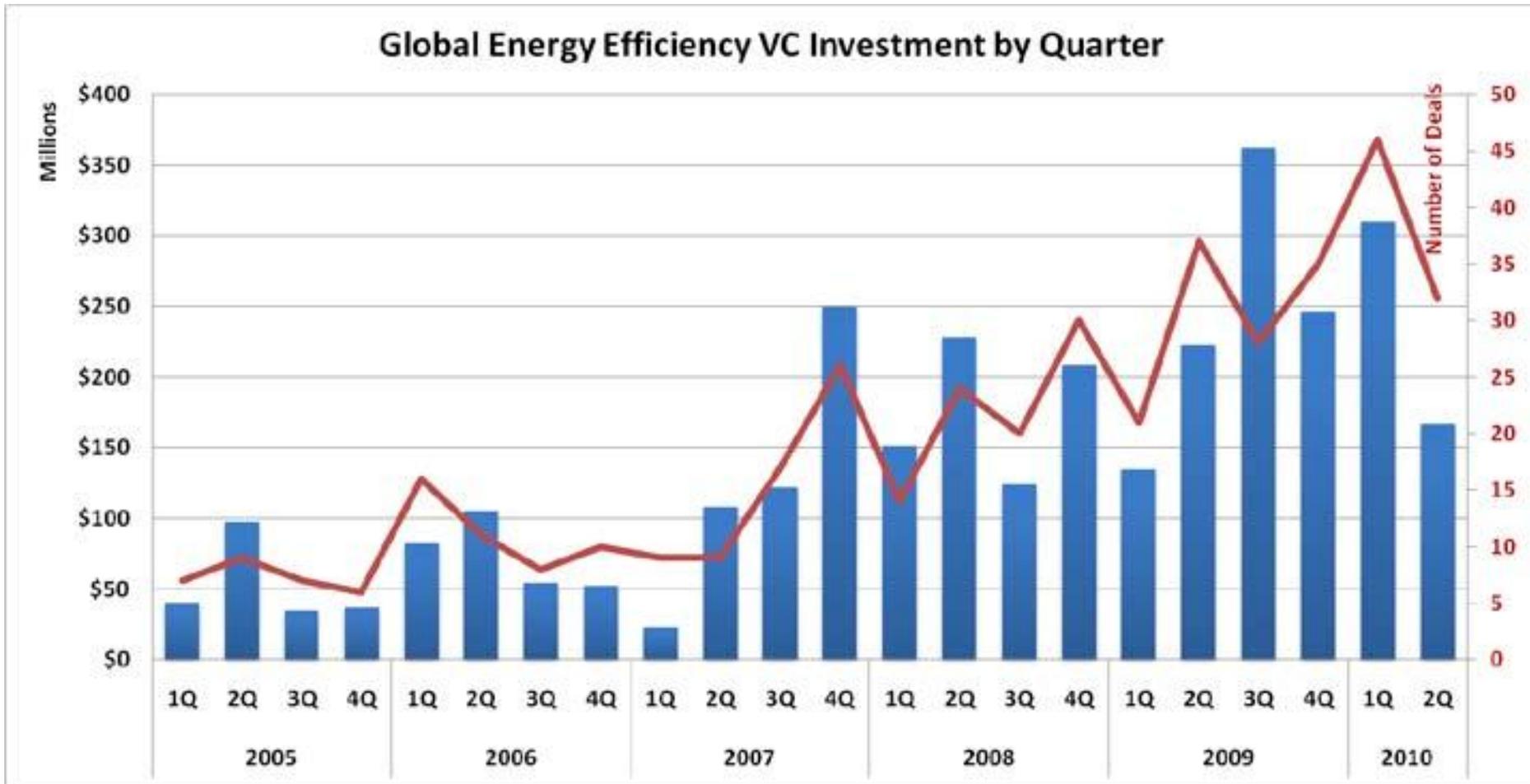


EE funding in North America grows steadily



Source: Consortium for Energy Efficiency

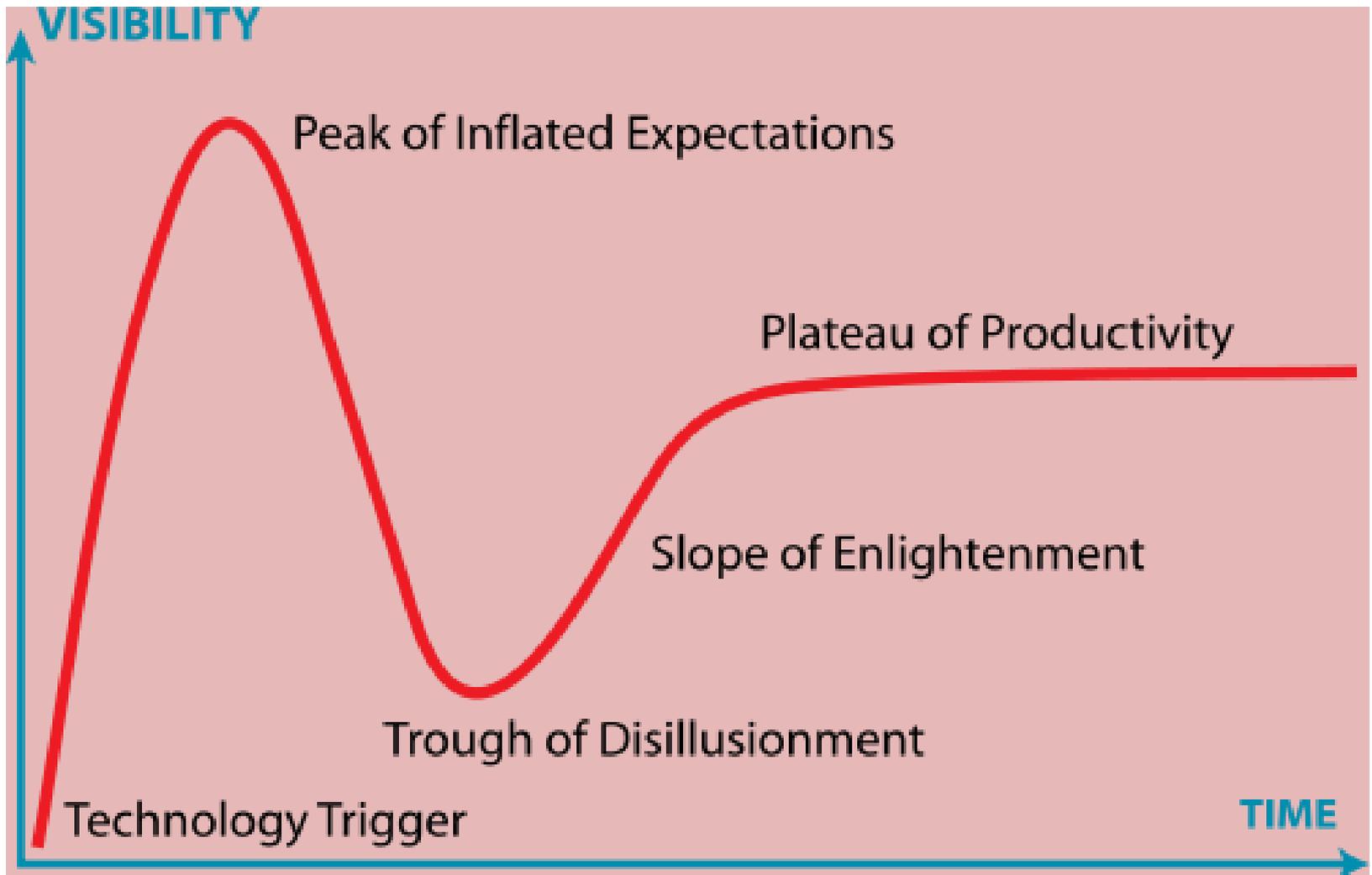
Private investment is also growing rapidly



Source: Cleantech Group



And so is the hype

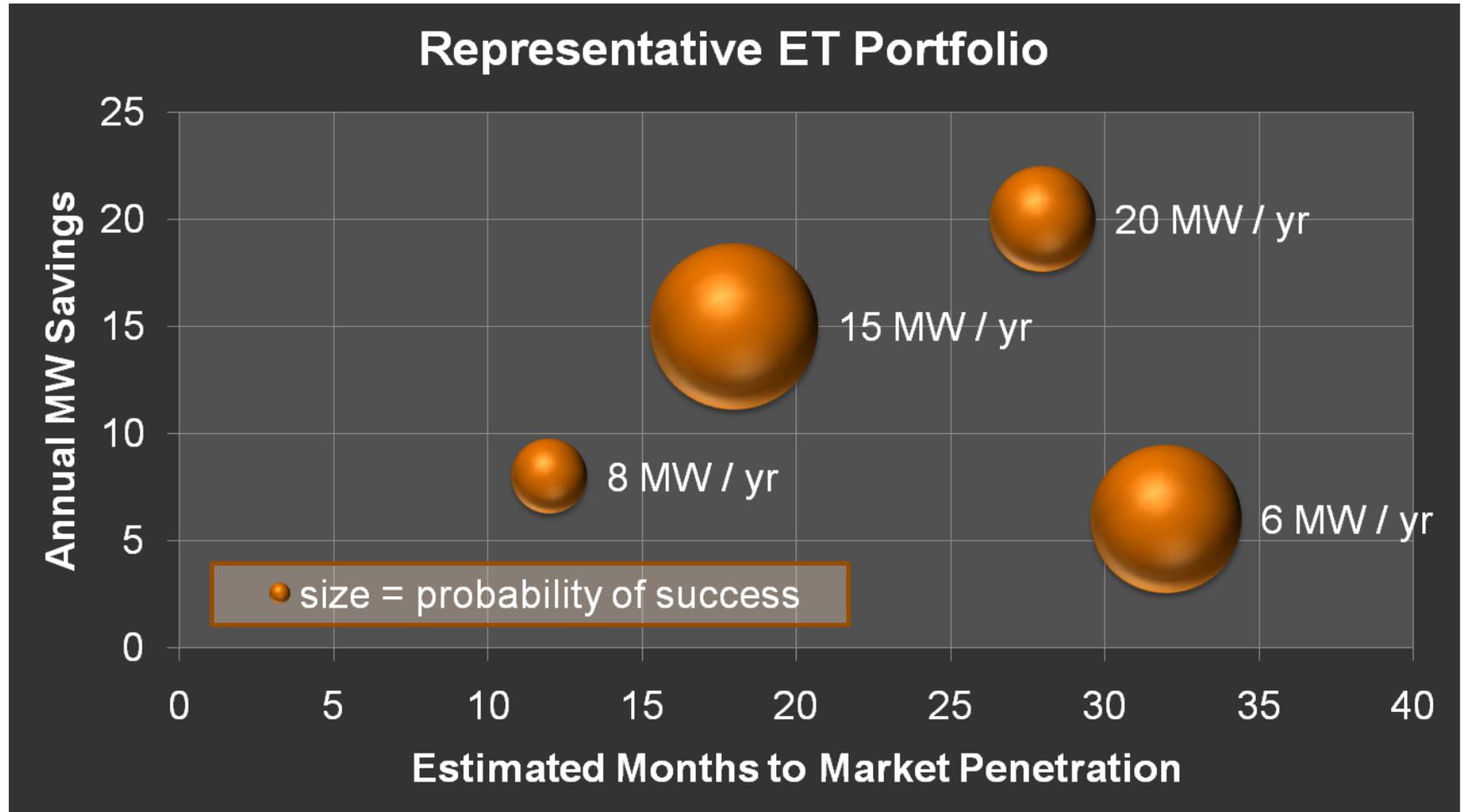


Source: Gartner Group

Expert teams are evaluating new technologies for building end-use efficiency

- ETCC (CA utilities & CEC PIER)
- LBL
- BPA E3T & NW partners
- NEEA & RETAC
- BC Hydro
- Ontario Power Authority
- E Source
- Focus on Energy / CleanTech Partners (WI)
- Pecan Street Project (TX)
- EPRI
- NYSERDA
- CEE
- Massachusetts Technology Collaborative
- Connecticut Clean Energy Fund
- ACEEE
- EPA Climate Choice
- Advanced Energy (NC)
- UK Carbon Trust
- Electricité de France
- + emerging technology consultants

EE program administrators use a portfolio approach to manage innovation risk





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U.S. DEPARTMENT OF ENERGY National Development and Reform Commission (NDRC)

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What are emerging technologies?

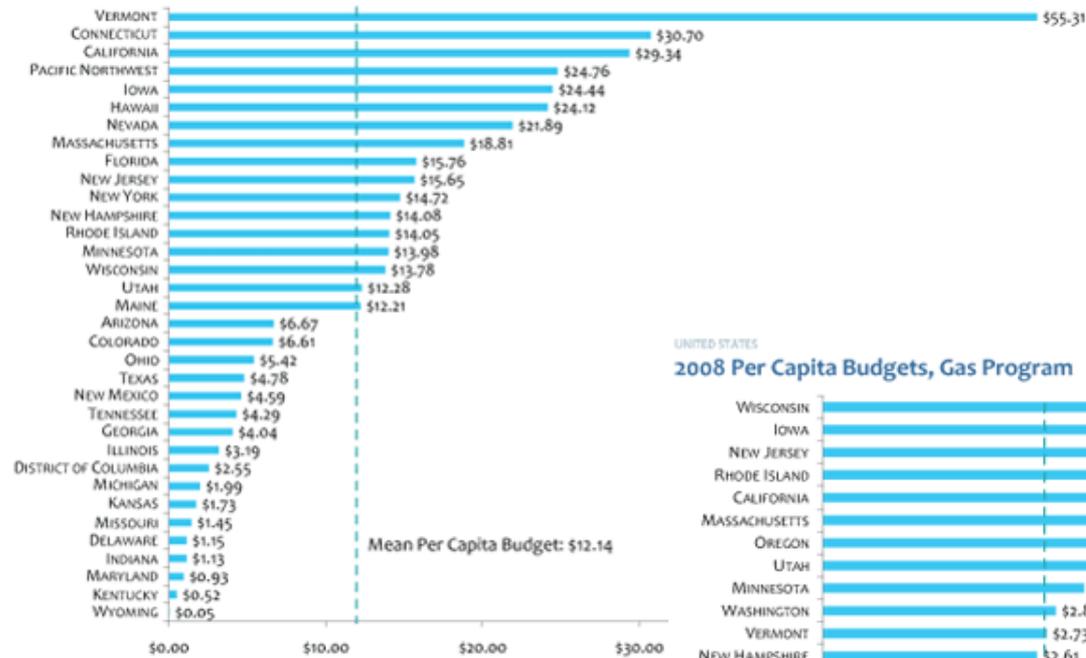


“An innovative technology or solution that promises a quantifiable increase in efficiency of electric end use.”

2008 per capita DSM budgets, by state

UNITED STATES

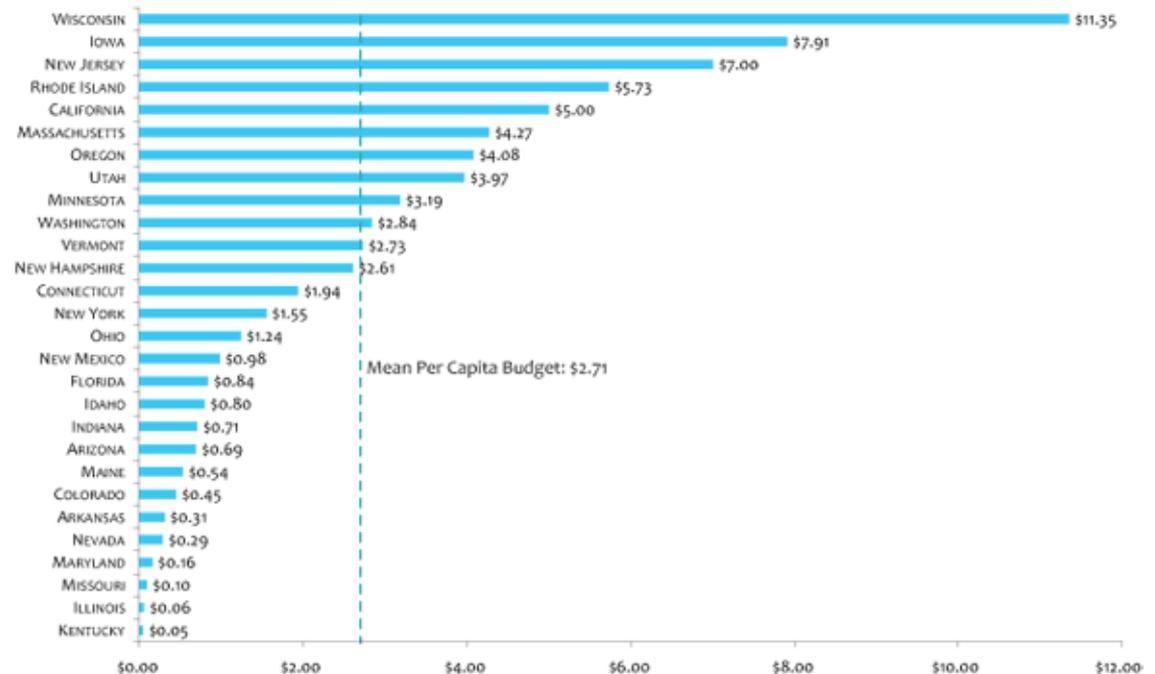
2008 Per Capita Budgets, Electric Program



Nevius M, Krouk J, Griffith S, Lasky C, "Reaching Higher, Annual Industry Report 2008," Consortium for Energy Efficiency, 2008.

UNITED STATES

2008 Per Capita Budgets, Gas Program



Nevius M, Krouk J, Griffith S, Lasky C, "Reaching Higher, Annual Industry Report 2008," Consortium for Energy Efficiency, 2008.