



*National Association of Energy  
Service Companies*

NAESCO and the U.S. ESCO  
Industry

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# *PRESENTATION TOPICS*

- ❖ What is NAESCO
- ❖ ESCOs and the Benefits of Performance Contracting
- ❖ Sample Projects
- ❖ Information from the NAESCO Database Project



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# *NATIONAL ASSOCIATION OF ENERGY SERVICE COMPANIES*

- ❖ NAESCO is a trade association
- ❖ Founded in 1983
- ❖ Represents Energy Service Companies (ESCOs) and their trade allies



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# *NAESCO MEMBERSHIP*

- ❖ Energy Service Companies (ESCOs)
- ❖ Distributed Generation (DG) Providers
- ❖ Utilities
- ❖ Energy Efficiency and DG Product Suppliers, Distributors and Manufacturers
- ❖ Financial Institutions
- ❖ Engineering and Design Firms, Law Firms, Consultants
- ❖ Government Agencies
- ❖ International Members



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# *What is an ESCO*

An ESCO is a company engaged in developing, installing, and arranging the financing for comprehensive, performance-based facility improvement projects centered around improving energy efficiency and reducing maintenance costs.



# *What is an ESCO*

Some ESCOs also develop and implement build/own/operate distributed generation, cogeneration, or combined heat & power (CHP) projects.

ESCOs may also arrange on behalf of the customer for electric and gas supply.



# *What ESCOs Do*

- ❖ Qualified ESCOs provide a wide range of technical solutions and services
  - Perform investment grade audits
  - Provide project design & engineering
  - Arrange sources of project financing
  - Enable equipment selection & acquisition
  - Manage construction & equipment installation



# *What ESCOs Do*

- Offer equipment & systems commissioning
- Undertake savings measurement & verification
- Offer equipment maintenance services
- Conduct technical training
- Assist with utility rate negotiation
- Facilitate access to available utility incentive or grant programs
- Assume performance risk





# *Benefits of Energy Performance Contracting*

- ❖ ESCOs have a broad range of expertise in energy efficiency technologies
- ❖ ESCOs provide one-stop shopping for comprehensive project design and delivery, thus accelerating project implementation
- ❖ ESCOs educate prospective customers on the value of a net present value or life cycle cost-focused procurement



# *Benefits of Energy Performance Contracting (continued)*

- ❖ ESCOs have a financial stake in long-term project performance and strong incentives to provide superior customer service after construction is completed
- ❖ ESCOs contractually guarantee environmental standards of comfort (e.g., temperature, ventilation rates, and humidity and light levels)
- ❖ ESCOs contractually guarantee project savings



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# *Misconceptions About ESCOs*

- ❖ ESCOs are financial institutions
- ❖ ESCOs carry all the project risk



# *Recent ESCO Projects*

## St. Barnabas Medical Center – Custom Energy

- ❖ 2 buildings; \$5.3 million contract
- ❖ Installed new energy management system
- ❖ HVAC repairs
- ❖ Lighting retrofit
- ❖ Replace electric chillers w/ steam absorption chillers
- ❖ **RESULTS:** \$690,000/year in energy cost savings



# *Recent ESCO Projects*

Houston Independent School District – Sempra Energy Solutions

- ❖ 24 buildings; \$12.7 million contract
- ❖ Replaced 42 chillers
- ❖ Retrofitted 24,000 lighting fixtures
- ❖ Constructed new 1,200 ton remote central chiller plant
- ❖ **RESULTS:** \$1,381,291 annual energy cost savings



# *Recent ESCO Projects*

Syracuse University – Alliant Energy Integrated Services – Cogenex

- ❖ 8 million sq. ft.; \$12.5 million contract
- ❖ Improvements to HVAC system
- ❖ Installation of energy management systems
- ❖ Installation of high efficiency motors
- ❖ Converting/replacing boiler plants
- ❖ **RESULTS:** \$1.8 million annual energy cost savings



# *Recent ESCO Projects*

## Fort Bragg – Honeywell

- ❖ 5,400 buildings; \$14 million contract
- ❖ Automation of building controls systems
- ❖ HVAC and lighting retrofits
- ❖ Replacement of oil-fired steam plant with gas boilers
- ❖ **RESULTS:** \$2 million annually in energy cost savings



# *Recent ESCO Projects*

## Allegheny County -- NORESKO

- ❖ 100+ facilities; \$9 million contract (to date)
- ❖ Lighting retrofit
- ❖ Chiller replacement
- ❖ Energy management systems
- ❖ Water conservation systems
- ❖ Window replacement
- ❖ **RESULTS:** \$1,377,000 annual cost savings





# *Recent ESCO Projects*

## Additional Allegheny County Projects

- ❖ Allegheny County Housing Authority – Honeywell
  - Result: \$806,000 annual cost savings
  - 45 buildings; \$6,700,000 project costs
- ❖ Allegheny Valley Hospital – Siemens Building Technologies
  - 1 building, many wings; \$1,449,514 project costs
  - Result: \$402,061 annual cost savings



# *NAESCO Database Project*

## ❖ Objectives

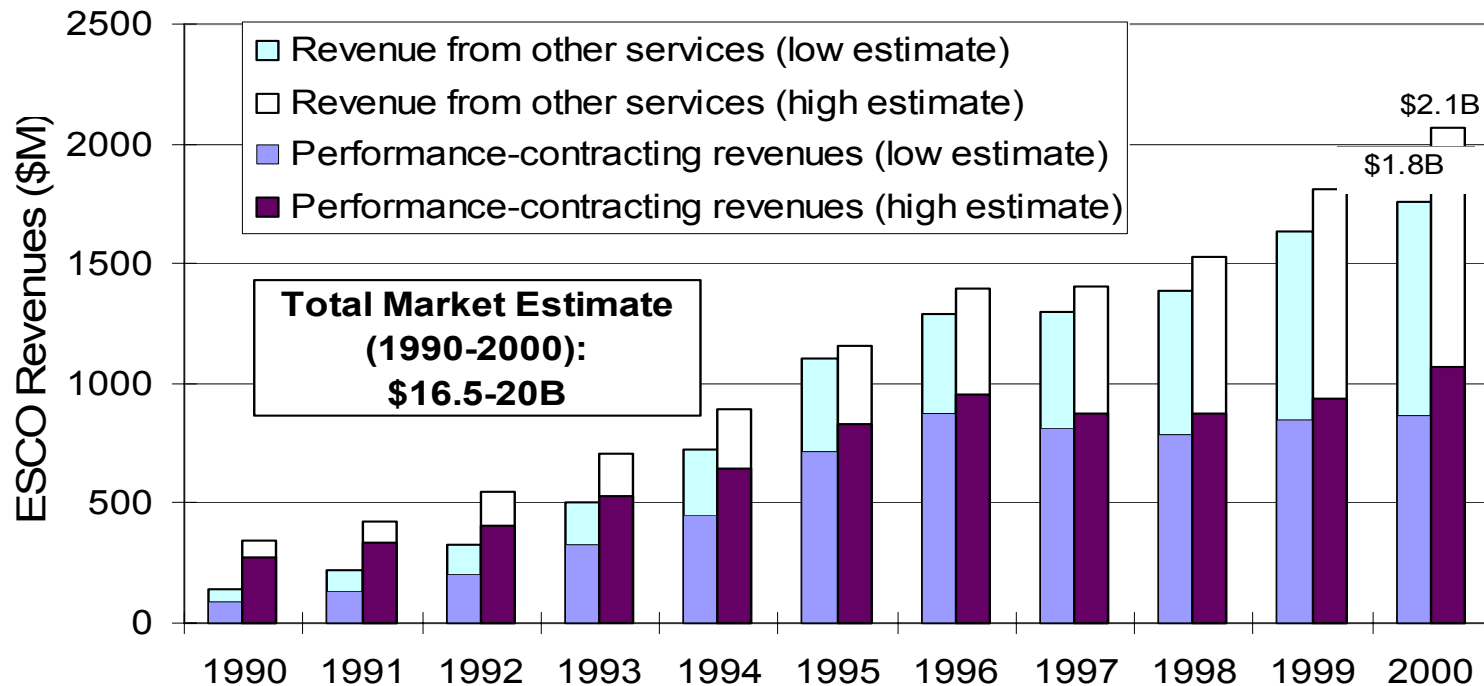
- Track industry performance and evolution
- Project data useful for economic analysis, policy development, and technology impact

## ❖ Approach

- NAESCO/Lawrence Berkeley National Laboratory partnership with voluntary participation from industry and government agencies
- Project data primarily from NAESCO accreditation process; 18% of projects are from state agencies
- Information verified through peer review and reference checks



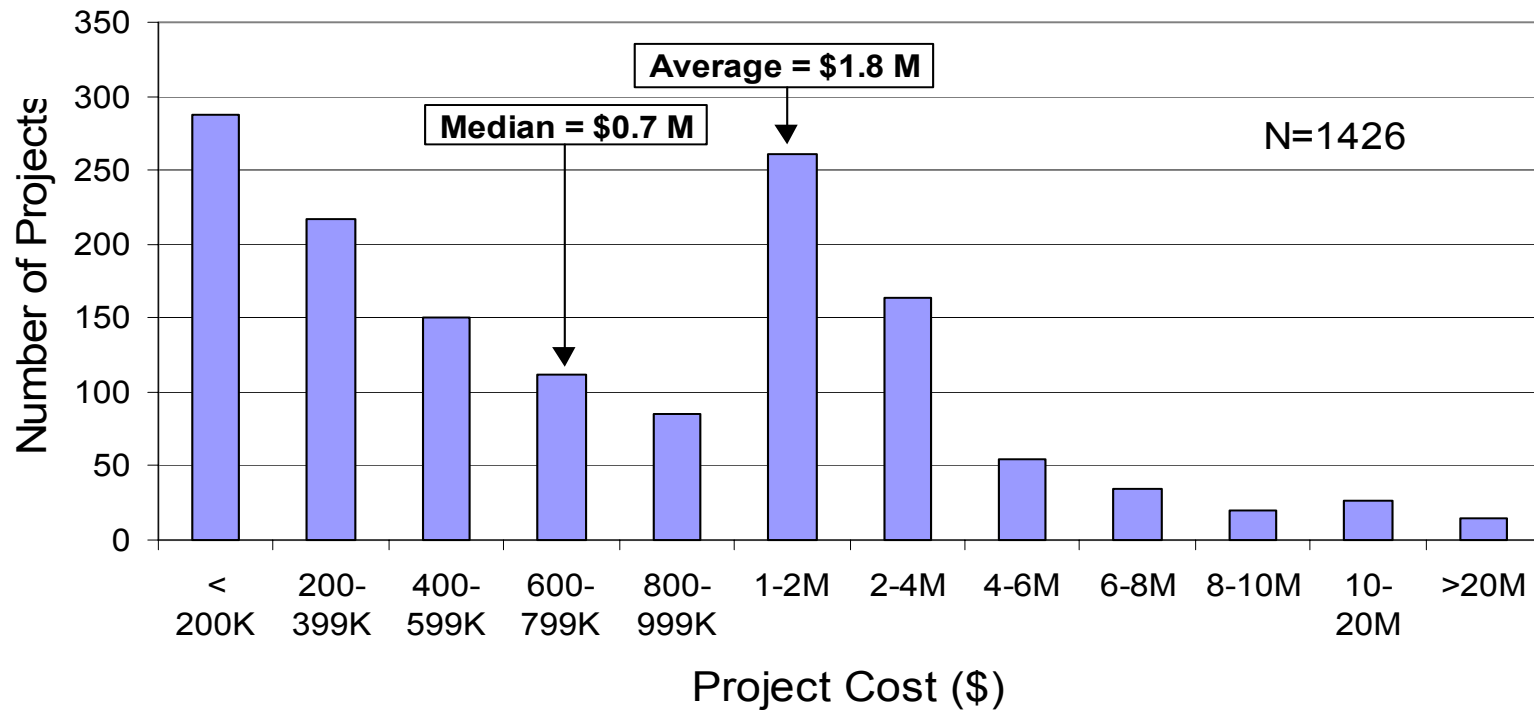
# *ESCO Industry has Experienced Strong Growth*



- ❖ ESCO Market for energy-efficiency related services is ~\$1.8-\$2.1B in 2000; 24% annual growth rate (1990-2000)
- ❖ Performance Contract revenues: \$0.9-\$1.0B in 2000



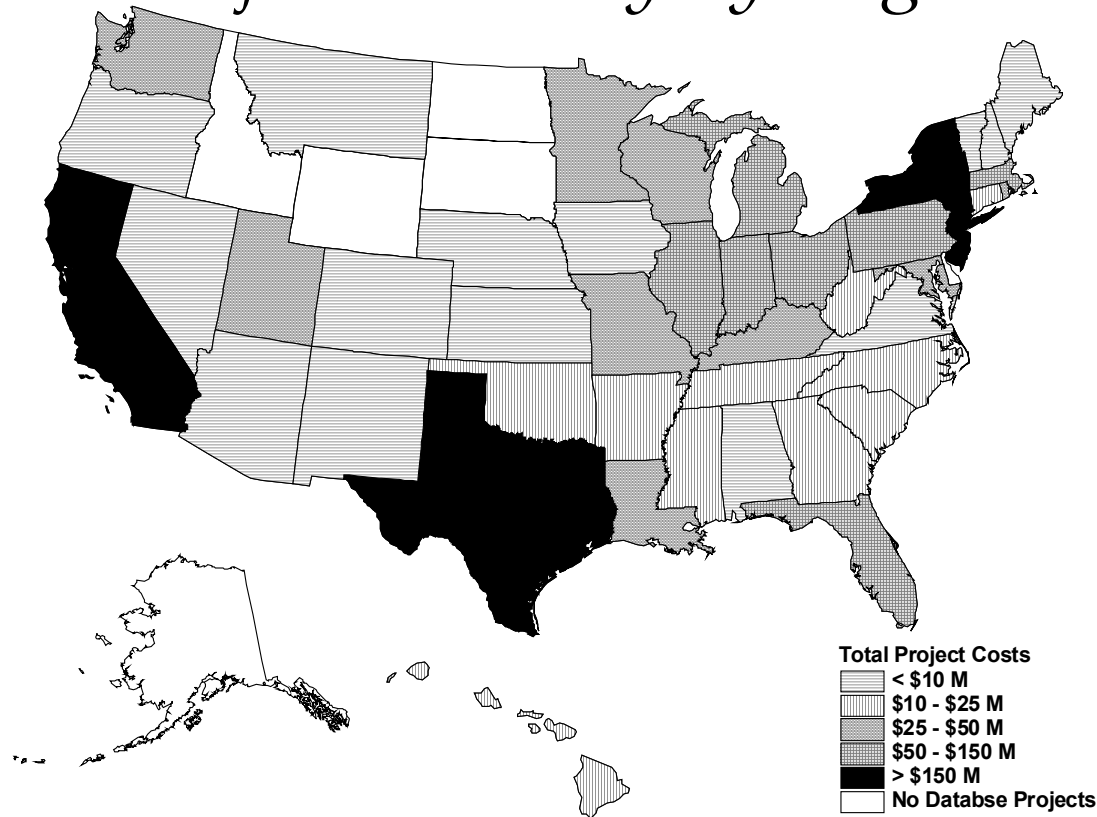
# Project Investment Trends



- ❖ \$2.55B of work completed by 51 companies; 1489 projects in database
- ❖ Median and average project costs: \$0.7M and \$1.8M, respectively



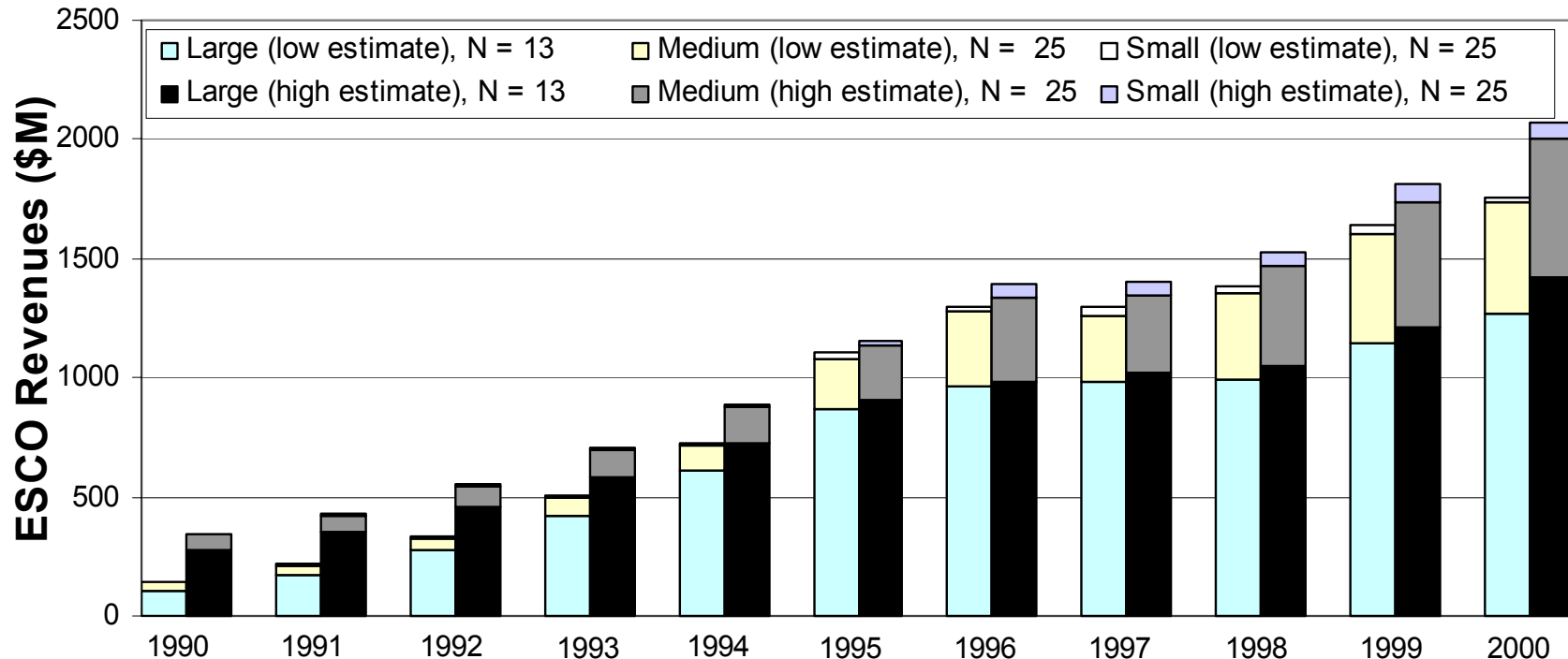
# Project Activity by Region



- ❖ NY, NJ, CA and TX account for 44% of market activity
- ❖ Substantial market activity in NJ and MA where well funded energy efficiency programs have provided economic incentives
- ❖ ESCO activities also high in populous states of IL, OH, IN, PA which have not supported utility sponsored or ratepayer funded energy efficiency programs



# ESCO Industry Activity Led by 13 Firms



- ❖ Most activity performed by a few large companies: 13 “large” companies account for ~75% of total industry activity
- ❖ Prominence of large companies consistent over time



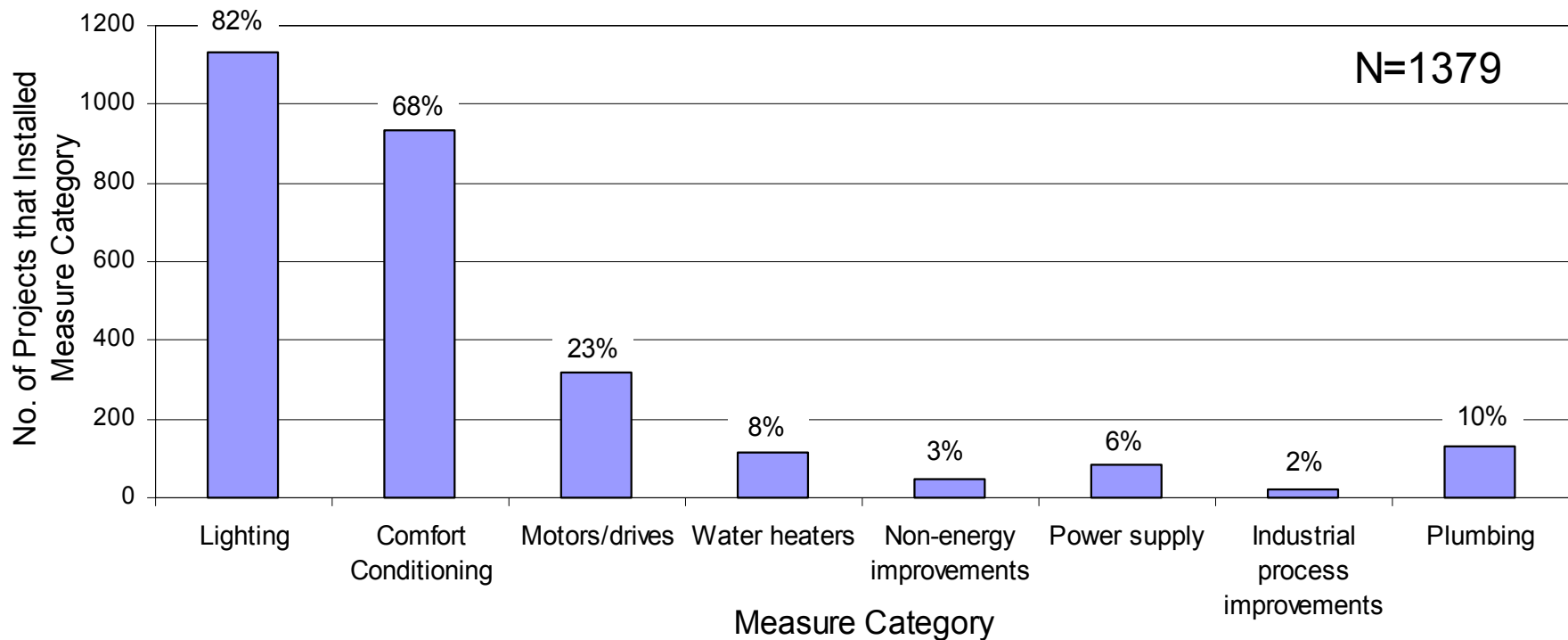
## *Project Facility Types and Frequency in Database*

Facility Type	No. of Projects (N=1489)	Percent
Education (e.g., K-12 & college classrooms)	552	37%
Food Sales (e.g., grocery store)	10	1%
Food Service (e.g., restaurant, cafeteria)	19	1%
Health Care	179	12%
Lodging (e.g., hotels, motels)	13	1%
Mercantile and Service (e.g., retail)	39	3%
Office (e.g., general office space)	238	16%
Public Assembly (e.g., stadiums, auditoriums)	29	2%
Public Order and Safety	41	3%
Residential Housing	53	4%
Warehouse	22	1%
Wastewater Treatment Plant	5	0%
Multiple	86	6%
Other	168	11%



- ❖ The majority of retrofit projects (65%) were implemented in educational facilities, offices, and healthcare facilities

## *Frequency of Installed Measures*

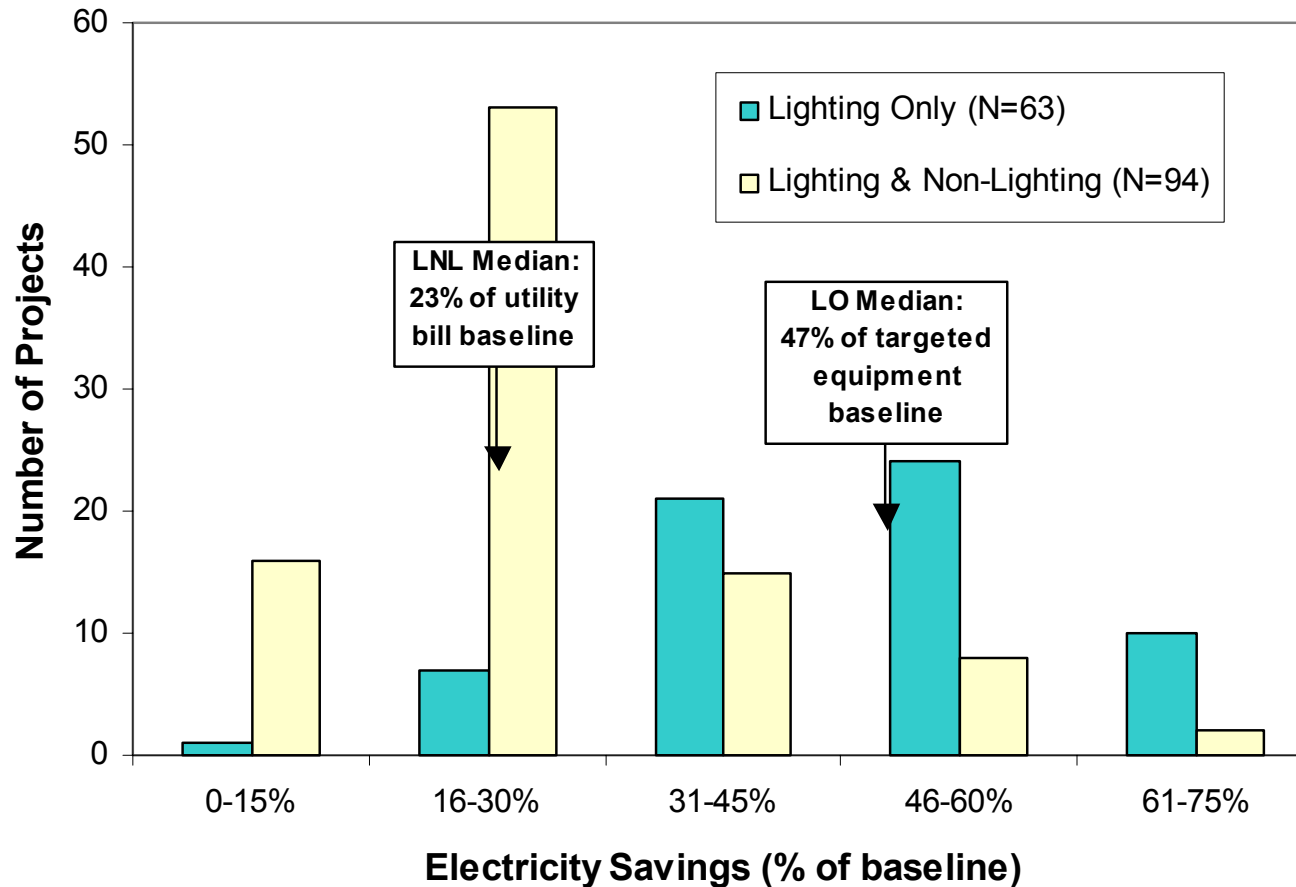


- ❖ Typical project consists of multiple measures and strategies
- ❖ Lighting and HVAC are most common measures, in both institutional and private sectors
- ❖ Non-energy improvements (e.g., roofs, asbestos abatement) reported in institutional sector projects





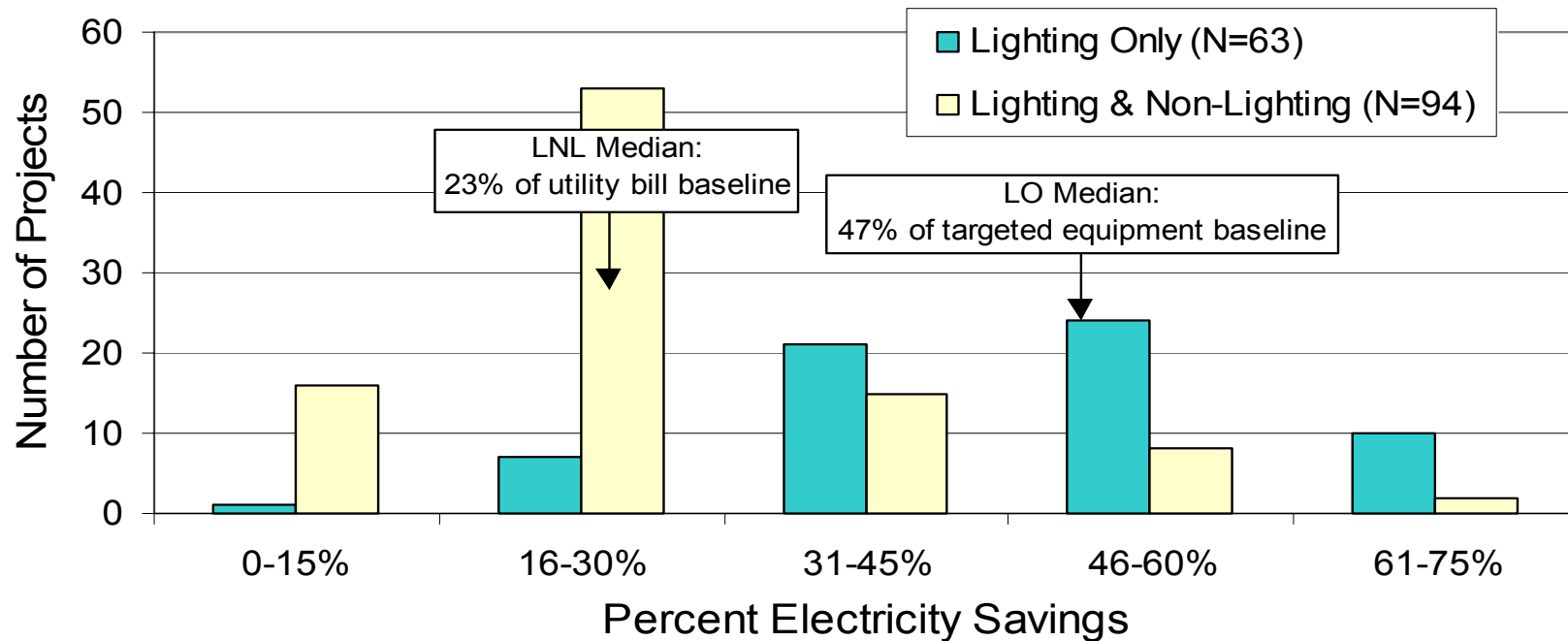
# Electricity Savings by Retrofit Strategy



NOTE: All projects in LO sample employ Equipment Targeted baseline metric;  
LNL sample includes only Utility Bill baseline



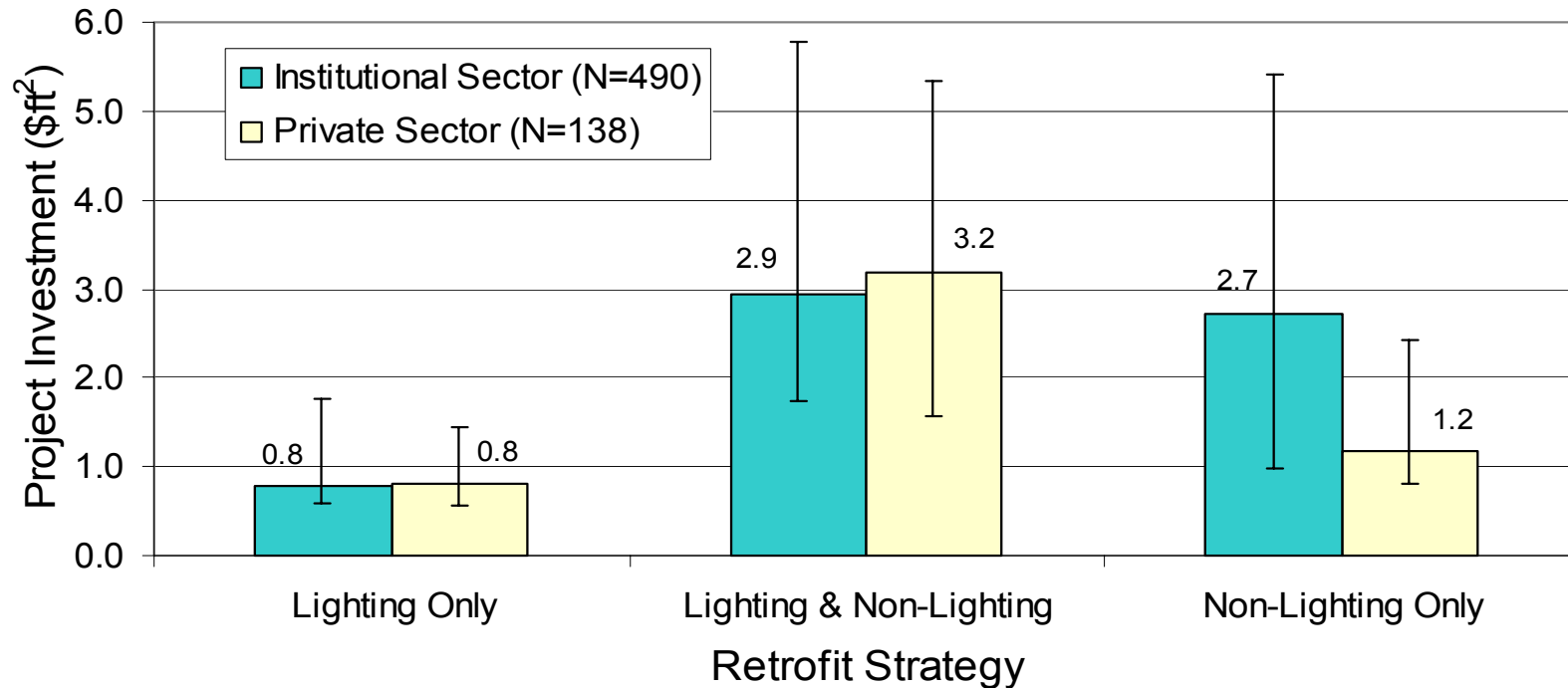
# Project Savings Obtained from Energy Efficiency Measures



- ❖ Two baseline metrics: utility bill and targeted equipment
- ❖ Lighting only projects saved 47% of equipment targeted electricity
- ❖ Lighting and non-lighting projects saved 23% of utility bill electricity



## Impact of Retrofit Strategy on Project Costs



- ❖ ESCOs investment levels significantly greater in Comprehensive Projects compared to Lighting Only
- ❖ Lighting project costs comparable across institutional and private sectors



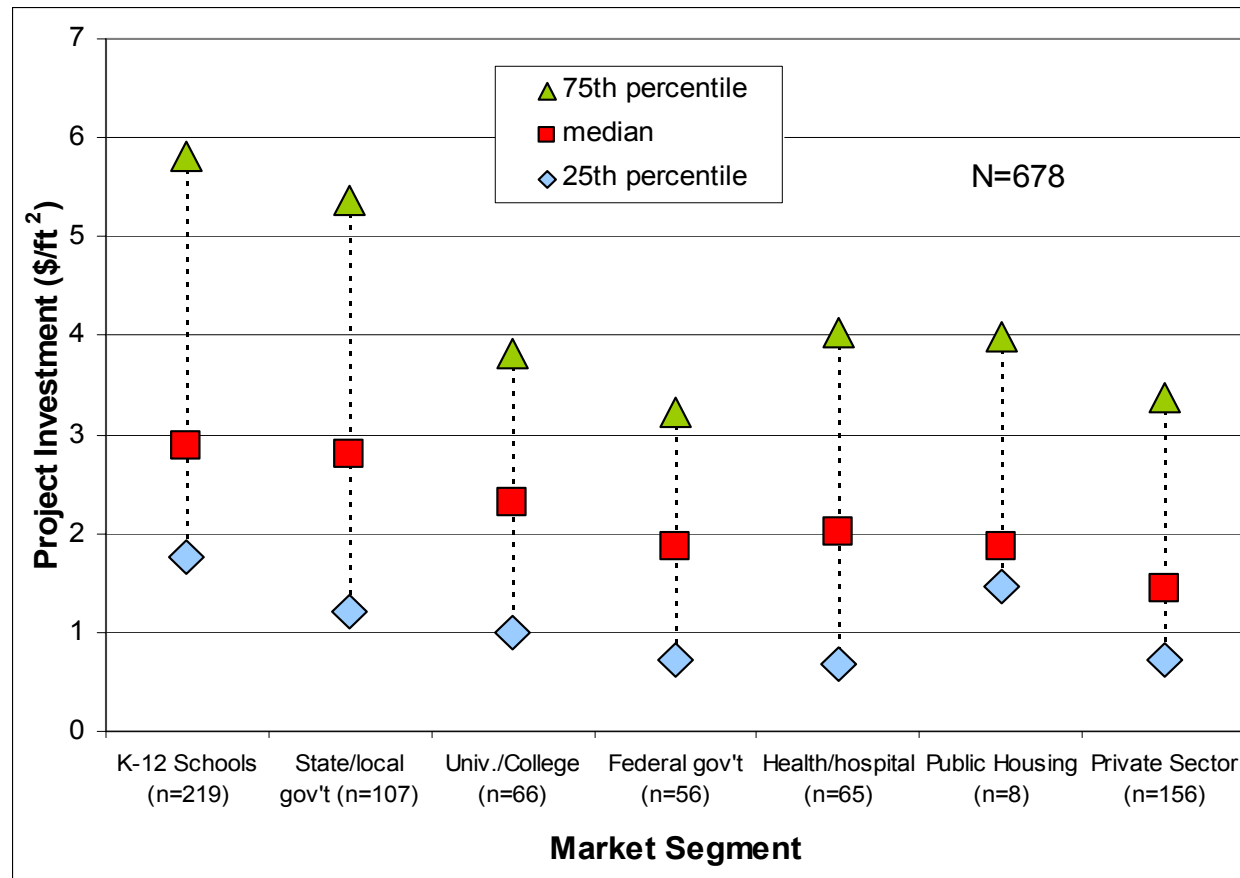
## *SPT Influenced by Choice of Retrofit Strategy & State Guidelines*

Retrofit Strategy	Simple Payback Time (years)							
	Institutional Sector				Private Sector			
	N	25 val	median	75 val	N	25 val	median	75 val
Lighting Only	146	1	2	4	128	1	2	4
Lighting & Non-Lighting	498	5	8	13	97	3	4	6
Non-Lighting Only	98	2	8	14	73	1	2	5

- ❖ More private sector projects are lighting only (43% vs 20%); Two year SPT for institutional and private sector markets
- ❖ Lighting/non-lighting and non-lighting only projects payback time is much longer in institutional than in private sector
- ❖ SPT influenced by State performance contracting guidelines; 34 states allow max. contract term >10+ years



# Project Investment Trends by Market Sector



- ❖ Median Project investment levels are 1.8 times greater in institutional than private sector projects (\$2.50 vs. \$1.40/ft<sup>2</sup>)



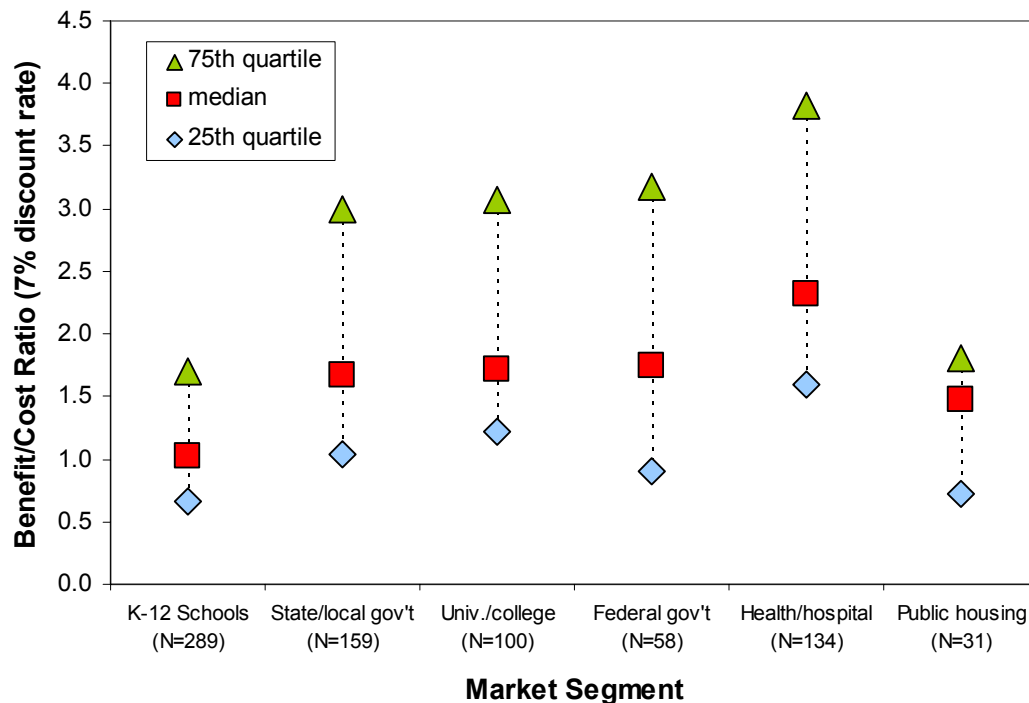
# Project Investment by Type of Contract Agreement

Project Agreement Type	Project Cost (\$M)				
	N	average	25 val	median	75 val
<b>Performance-based Contracts</b>	<b>621</b>	<b>2.3</b>	<b>0.4</b>	<b>1.0</b>	<b>2.4</b>
Guaranteed savings	533	2.5	0.5	1.2	2.5
Guaranteed payout term	3	2.4	1.6	1.7	2.8
Asset ownership/chauffage	1	5.0	5.0	5.0	5.0
Shared savings	69	1.2	0.2	0.3	0.8
Pay-from-savings	15	2.4	0.7	1.2	2.3
<b>Non Performance-based Contracts</b>	<b>160</b>	<b>1.6</b>	<b>0.2</b>	<b>0.5</b>	<b>1.2</b>
Design/build	118	1.8	0.2	0.5	1.3
Fee-for-service	26	0.5	0.1	0.2	0.8
Fixed price	16	1.9	0.4	0.6	2.2

- ❖ Performance Contracting Agreements typically had higher project investment than the projects that reported non performance based contract
- ❖ Median Project investment was \$1.0 million vs. \$.05 million



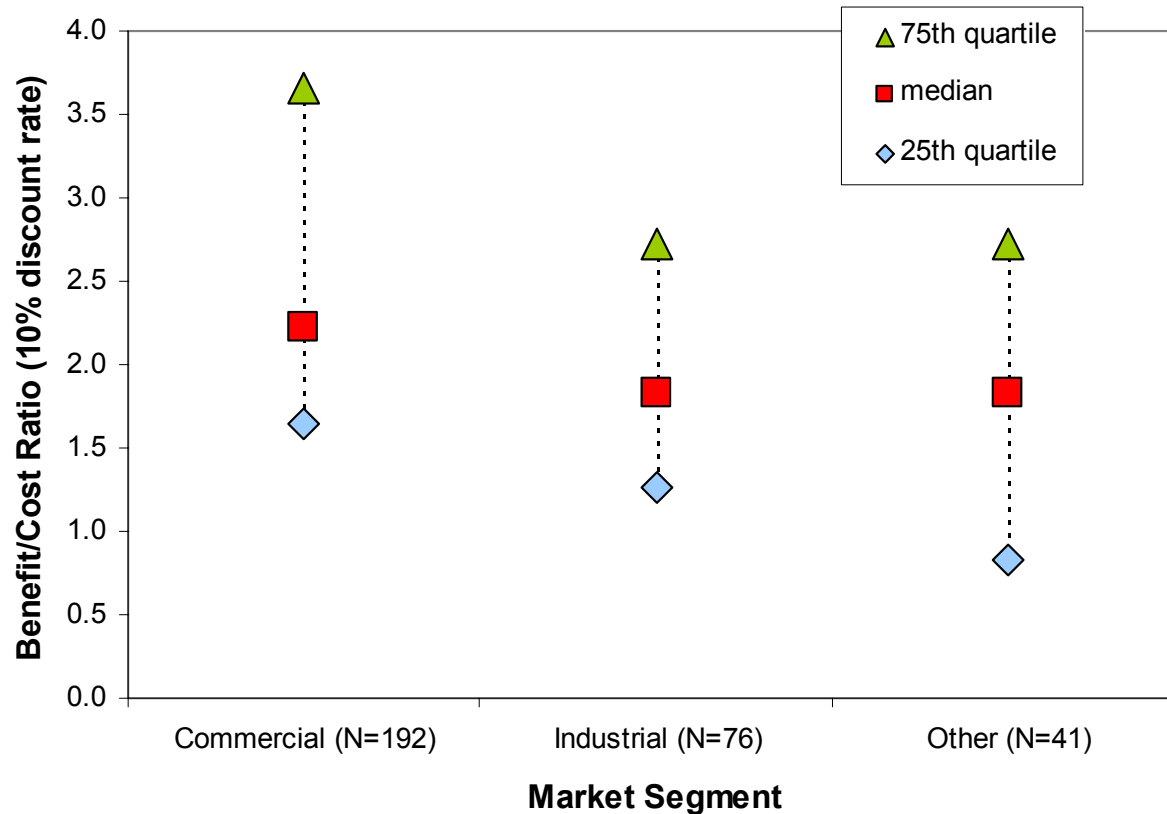
# Benefit/Cost Ratio of Institutional Sector Projects



- ❖ Estimate that institutional sector projects generated \$1.3 billion in net economic benefits with median B/C ratio of 1.6
- ❖ Median B/C value of 2.3 highest in health/hospital projects
- ❖ Median B/C ratios are 1.7 for state/local governments, university/colleges and federal government and 1.0 for schools (based on 7% discount rate)



# Benefit/Cost Ratio of Private Sector Projects

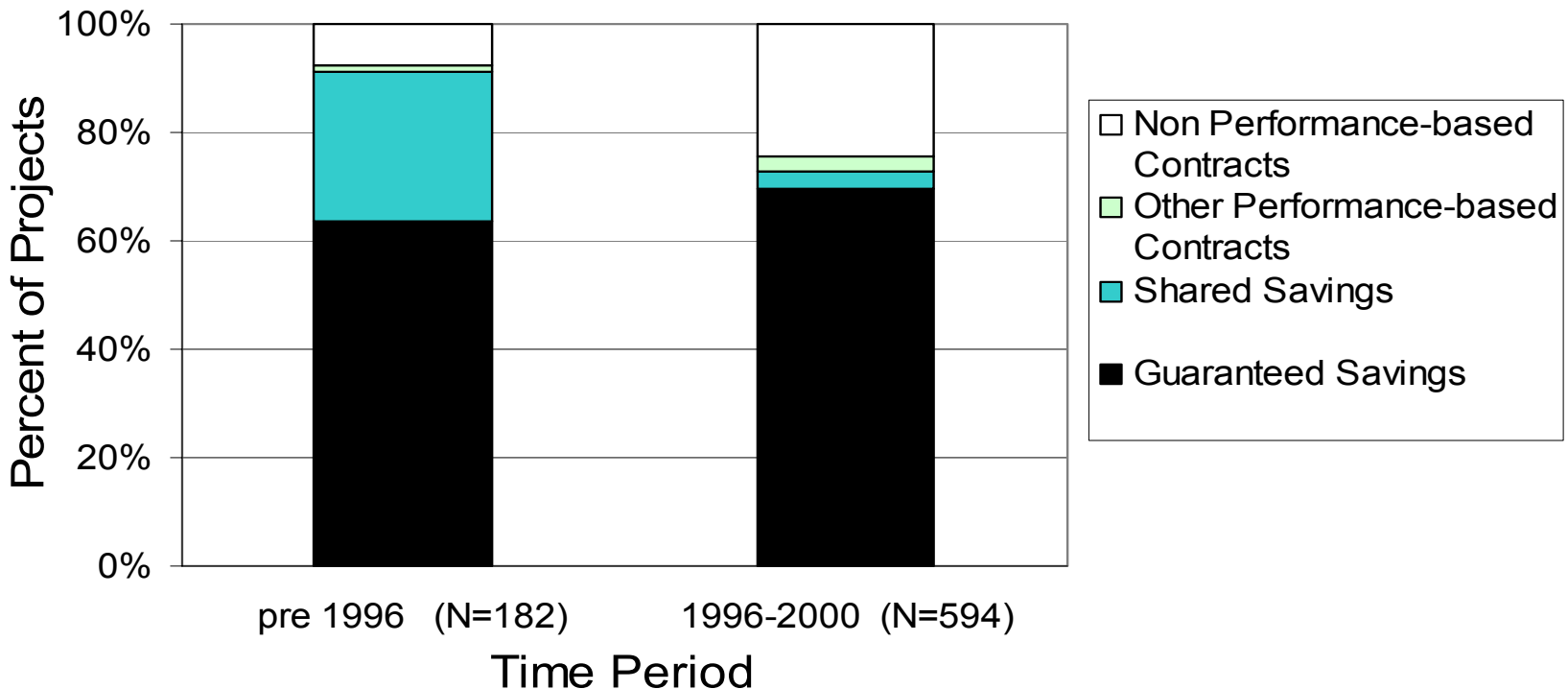


- ❖ Estimate that 309 private sector projects achieved \$320 million in net economic benefits with median B/C ratio of 2.1 (based on 10% discount rate)





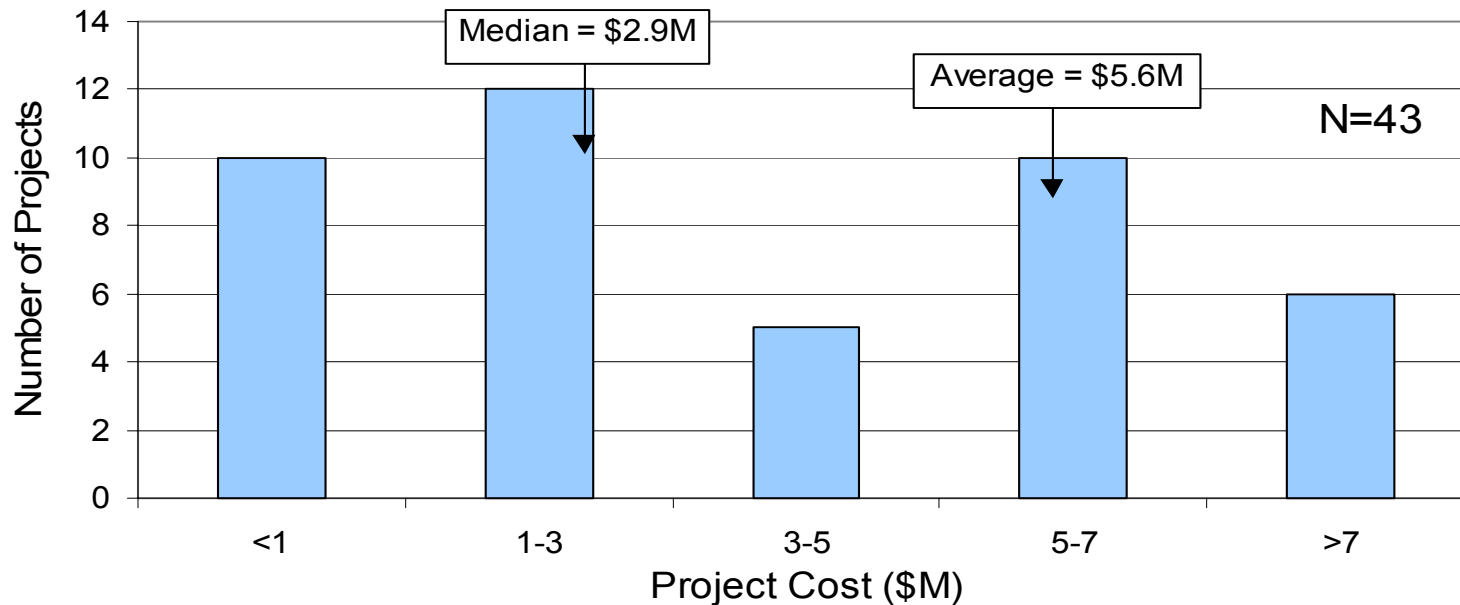
# Performance Contracting is a Decreasing Share of ESCO Business



- ❖ Market share of performance contracting is decreasing among NAESCO members (92% to 76%)
- ❖ Design/Build & Fee-for Service approaches account for ~30% of ESCO projects in 1996-2000



## *Some ESCOs Install Onsite & Distributed Generation in Comprehensive Projects*



- ❖ Measures include BUGs, Cogeneration, PV
- ❖ Location: mainly near Great Lakes and East coast - largest representation in NY
- ❖ Market sector: Mainly institutional sector (K-12 schools most popular)



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# *ESCO Product and Service Strategies*

- ❖ Performance contracting
- ❖ Design/Build Projects
- ❖ Build/own/operate major energy facilities
- ❖ Energy & Facility Management services
- ❖ Integrated energy services



# *Conclusions*

- ❖ U.S. ESCO business is well established
  - Market Activity (2000): ~\$2 Billion/yr
  - Sell “solutions” to customers: EE is byproduct
- ❖ Impact of Electricity Restructuring
  - Retail competition stalled
  - FERC promoting Demand Response; creates opportunities for “clean” onsite generation
- ❖ ESCO business is fluid and will continue to evolve
  - Expect industry growth + firm consolidation

