



# Interactions between Energy Efficiency Programs Funded under the Recovery Act and Utility Customer-Funded Energy Efficiency Programs

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# Study Motivation

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- American Recovery and Reinvestment Act (ARRA) invested significant funds for energy efficiency into state, local and tribal governments; many of these local govt. organizations did not have previous experience administering energy efficiency (EE) programs.
- Utility customer-funded EE programs have been offered since the 1980s; 2010 budgets are ~\$5.3B and are projected to increase to \$7.5-\$12B by 2020
- How have EE program administrators of these two sources of funds interacted since ARRA and what implications might those interactions have for the future of EE?

# Research Questions

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- What are the opportunities and challenges of this new environment?
- What short- and long-term impacts will this large, infusion of funds have on utility customer-funded programs?
- To what extent has the attribution of energy savings been a critical issue?
- Do the new ARRA-funded energy efficiency programs provide insights on roles or activities that are particularly well-suited to state and local government program administrators or administrators of utility customer programs?



# Study Approach

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- Focus on program design and funding choices made by state energy offices in 12 case study states selected based on:
    - Level of utility customer funding for EE programs
    - Diversity of program administrator models
    - Geographic diversity
  - Case study states:
    - California, Colorado, Florida, Hawaii, Maine, Massachusetts, Michigan, Minnesota, New York, North Carolina, Oregon and Wisconsin
  - Interviews with more than 80 energy efficiency actors
    - Staff at state energy offices
    - Commissioners and staff at regulatory commissions
    - Program administrators of utility customer-funded programs
    - Other energy efficiency industry experts
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# Study Scope

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- Recovery Act funding examined in this study includes:
    - State Energy Program (SEP) formula grants
    - Energy Efficiency and Conservation Block Grant (EECBG) funds administered directly by state energy offices
    - State Energy Efficient Appliance Rebate Program (SEEARP)
  - The study does not include:
    - DOE low-income weatherization programs
    - EECBG funding awarded directly to over 2,200 cities, counties and tribes
    - Competitive EECBG funding (Better Buildings grants)
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# Utility Customer-Funded Energy Efficiency Program Overview

# Utility Customer-Funded EE Program Landscape

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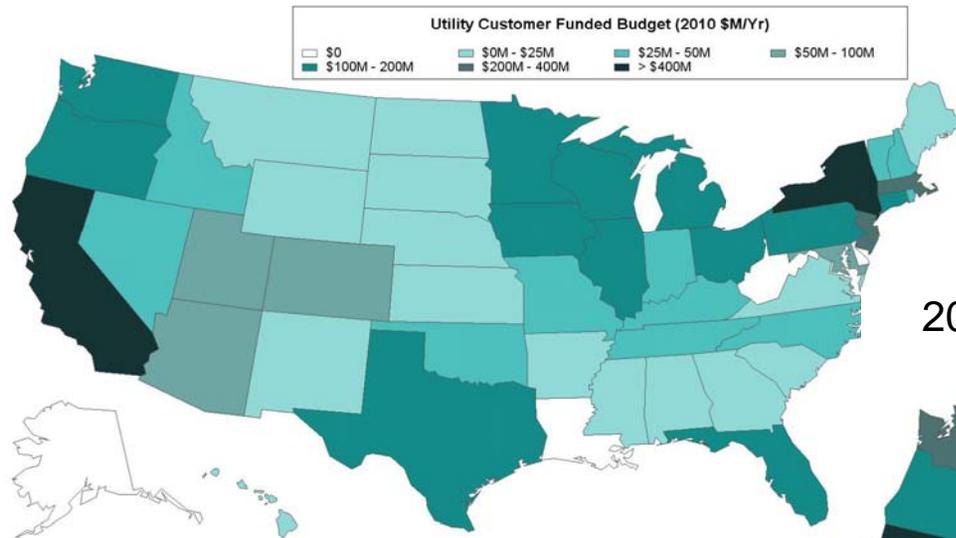
- Nearly all states have at least one utility or other program administrator that offers energy efficiency programs
  - Utilities administer programs in ~30+ states; third parties or state agencies administer programs in 9 states
  - 15 states have consistently spent more than 1% of annual utility revenues on EE over the last decade, although commitment levels vary significantly among states
- 20 states have passed Energy Efficiency Resource Standards (EERS)  
4 states considering EERS\*
  - EERS sets savings targets that will require a significant investment in energy efficiency

\*Adapted from ACEEE 2010. "State Energy Efficiency Resource Standard (EERS) Activity 2010" and Federal Energy Regulatory Commission, "Renewable Energy & Energy Efficiency: Energy Efficiency Resource Standards (EERS) and Goals"

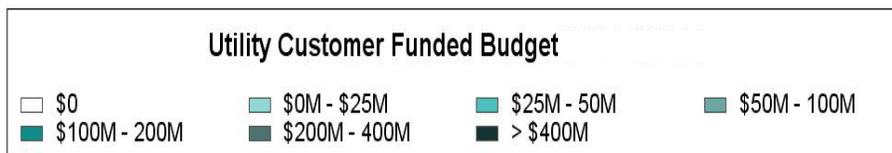
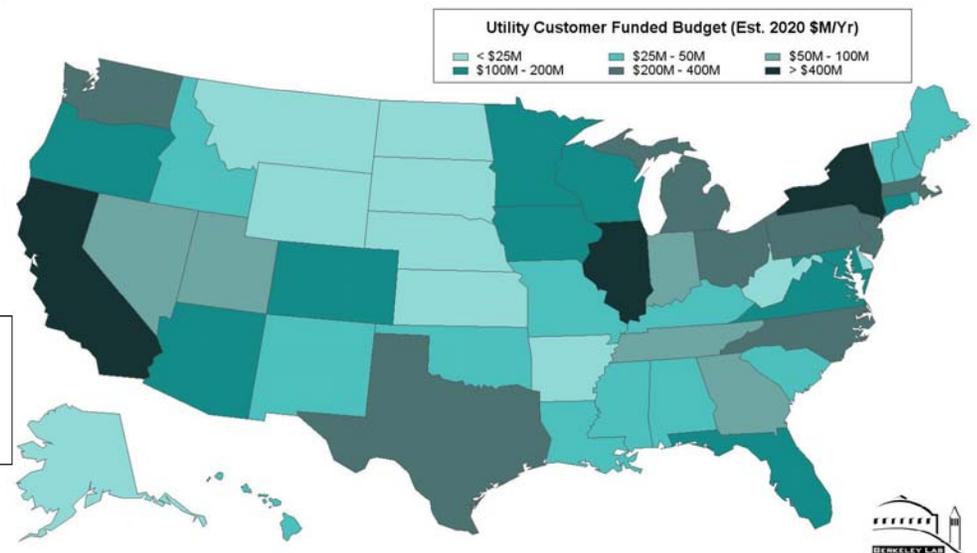
# Utility Customer Funding Nationally (2010-2020)



## 2010 Utility Customer Funded Budget



## 2020 Estimated Utility Customer Funded Budget

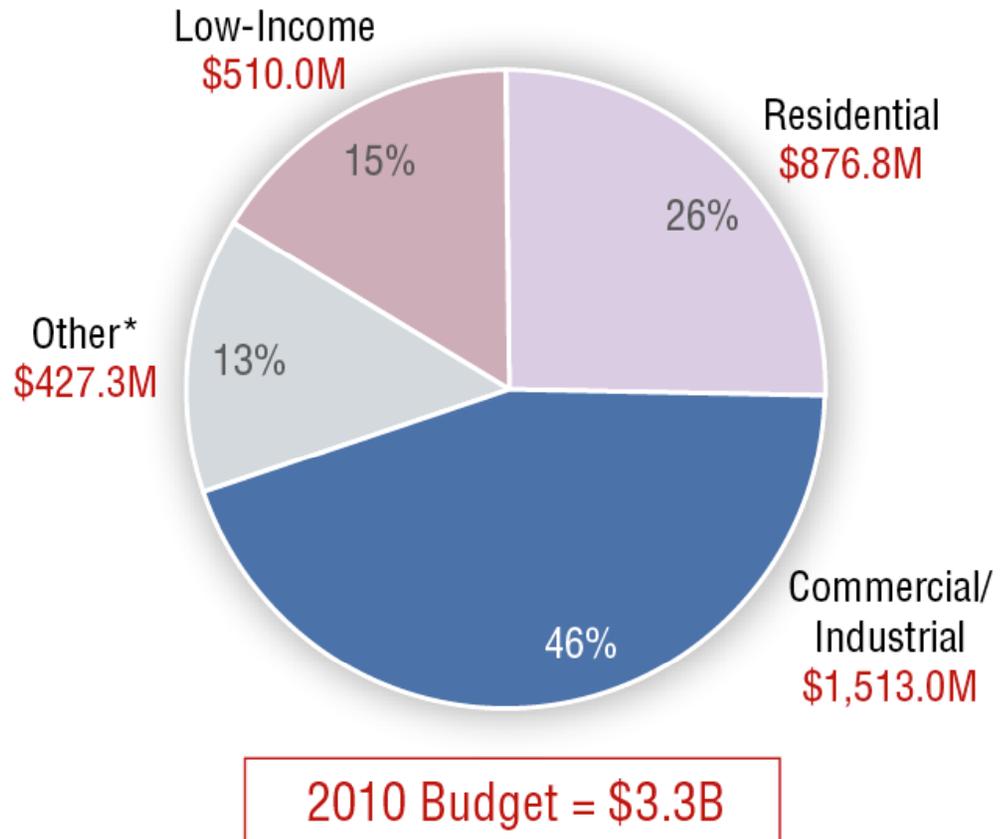


# Utility Customer Program Budgets



2010 electric and gas utility customer-funded EE program budgets for the 12 case study states

EE budgets per capita range between \$11-\$40 in 9 states and \$5-\$10 per capita in 3 states (NC, FL, MI) where utilities are just ramping up programs



\* Other includes administration, planning, EM&V, R&D, education and training, agricultural sector



# Overview of Recovery Act Funded State Energy Programs

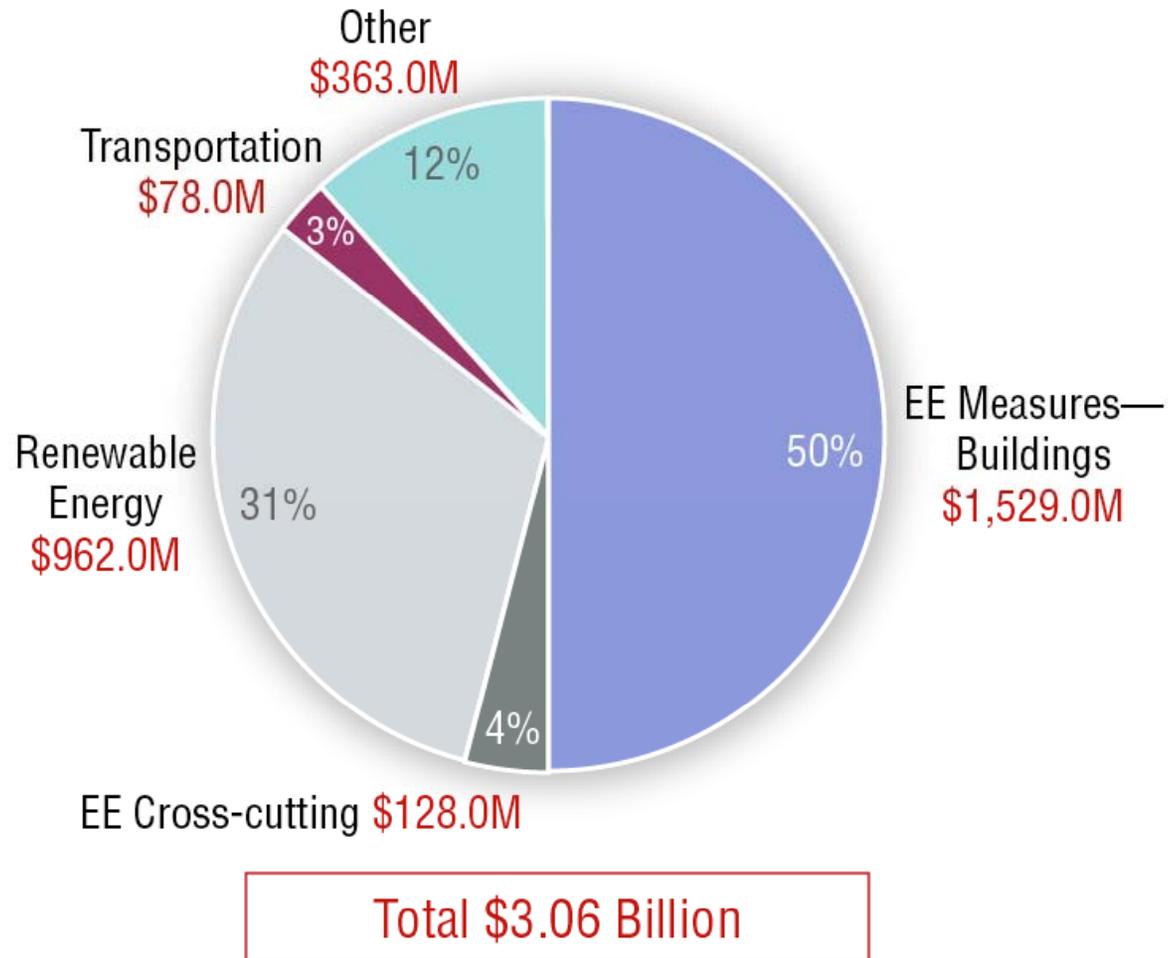
# Recovery Act Funding - National Overview

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- A large portion of ARRA funds were distributed as formula grants to states, counties, cities and tribes
  - \$3.1 billion for DOE's existing State Energy Program (SEP)
  - \$3.2 billion for the new Energy Efficiency and Conservation Block Grants (EECBG) program
    - \$2.73 billion for formula grants to states, counties, cities and tribes
    - \$486 million for competitive grants, largely the BetterBuildings program
  - \$300 million for the new State Energy Efficient Appliance Rebate Program (SEEARP)

# State Energy Program Budgets - National Trends



# Recovery Act Funding in 12 Case Study States

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- Program funding in 12 case study states includes only money directly administered by the state energy office
  - Funding totals for the 12 states = **\$1.28 billion**
    - SEP = \$940.1 million (30% of all SEP funds)
      - \$581.8 million of this (62%) spent on EE
    - EECBG = \$226 million (7% of all EECBG funds)
      - \$188.8 million of this (84%) spent on EE
    - SEEARP = \$117.5 million (39% of all SEEARP funds)
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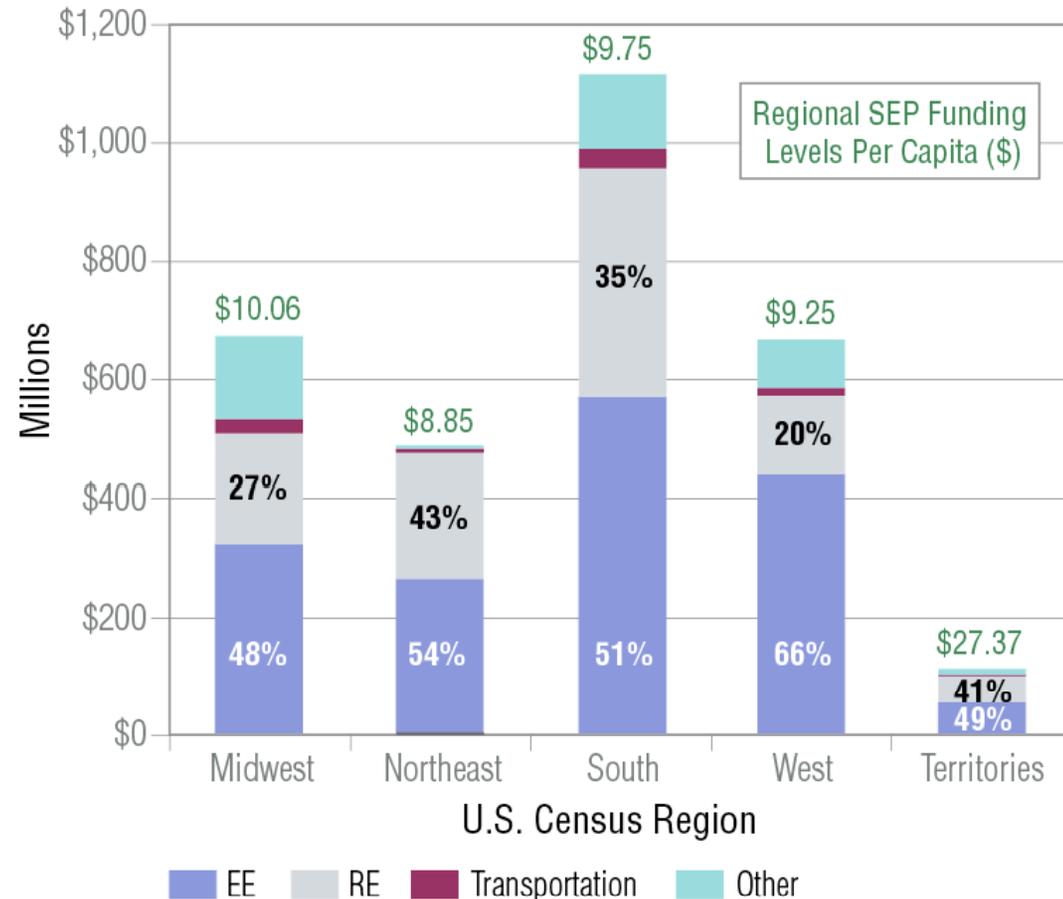


# Program Priorities and Design Choices

# Energy Efficiency vs. Renewables



In the State Energy Program (SEP) across the 50 states, SEOs budgeted about 50% for energy efficiency programs vs. 31% for renewable energy projects



# Energy Efficiency in Buildings



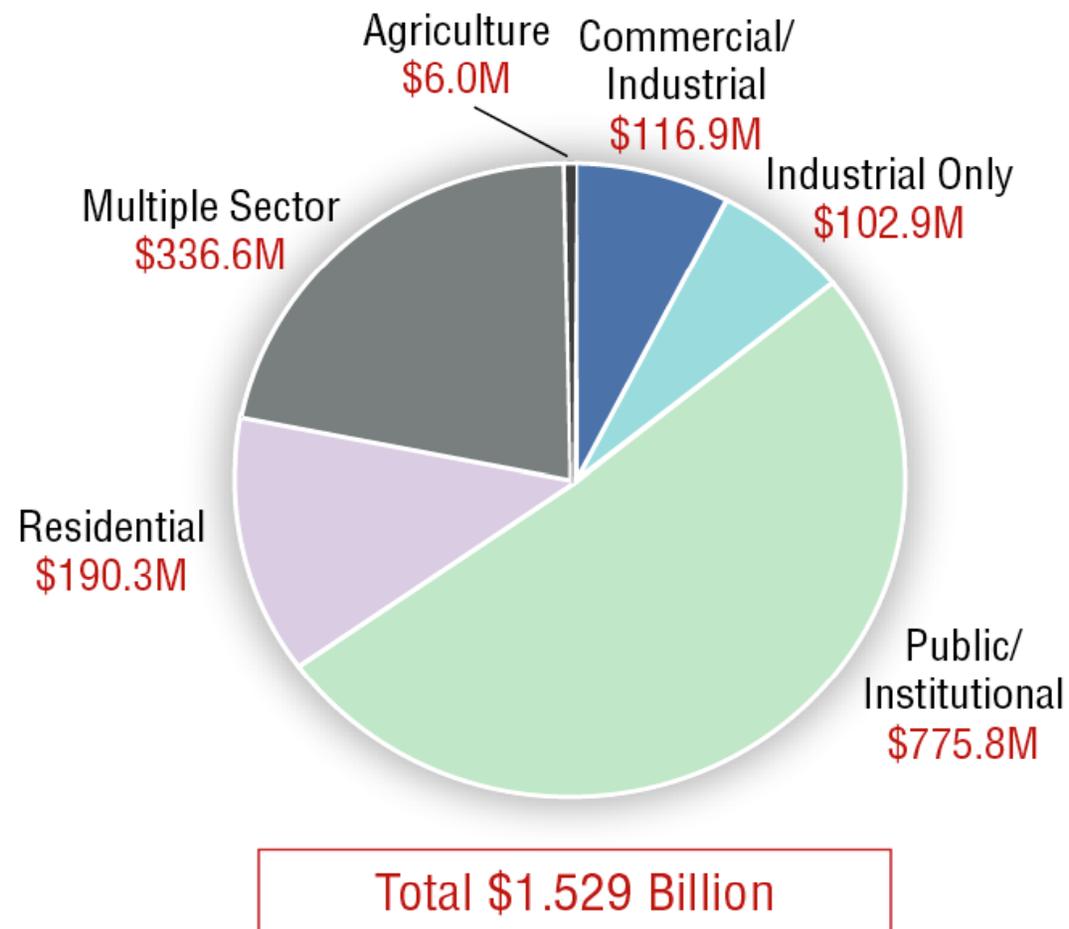
- More SEP funding targeted energy efficiency measures and equipment installations in **buildings** than any other purpose – building efficiency made up 51% of the \$3.1 billion SEP funding.

Program spending	Examples of programs and activities	SEP Funding (\$ million)
Measures and equipment in buildings	Audits, retrofits, retro-commissioning, industrial processes, technical assistance for performance contracting, revolving loan funds for energy efficiency projects	\$ 1,529
Cross-cutting programs	Building codes, energy efficiency workforce development, education and outreach, general technical assistance, marketing, databases, best practices sharing	\$ 128

# SEP Funding for EE in Buildings



- SEP energy efficiency funding (\$ million) for buildings by market sector for 50 states, five territories and the District of Columbia
- 36 states budgeted \$775M in programs targeted to public/institutional buildings
- Multiple sector programs can include just C/I or all sectors



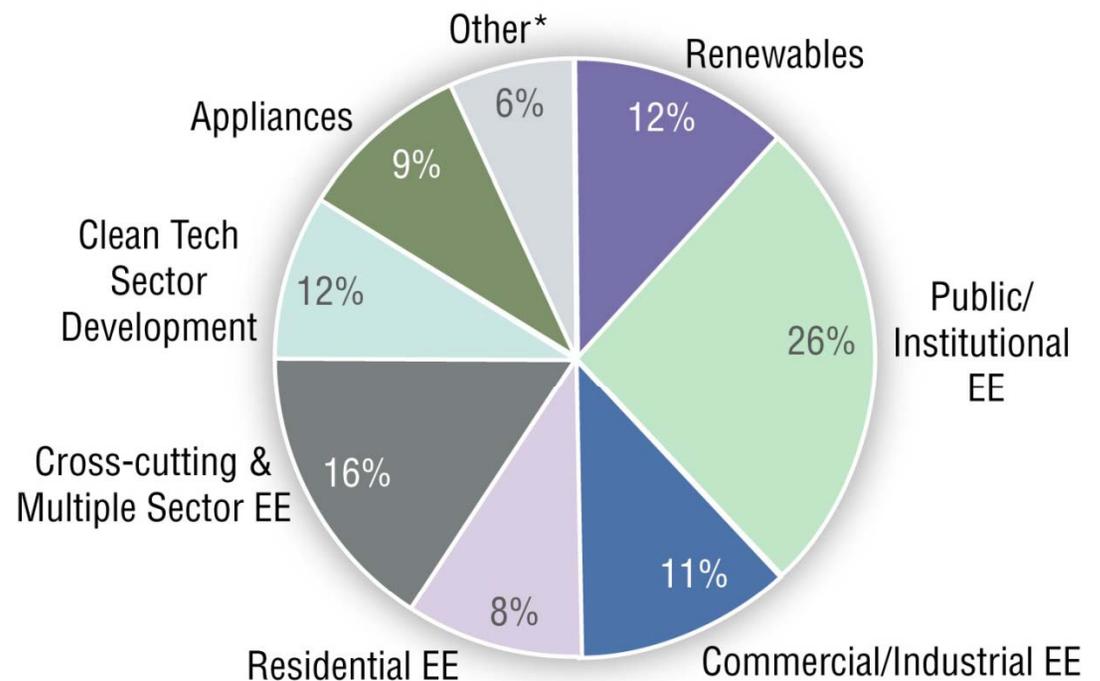
# Diverse Portfolio of Investments

(12 case study states)



Recovery Act funding in Case Study States by Sector

- Most SEOs in the 12 states opted for a diverse portfolio of programs and activities across the selected ARRA-funded programs (SEP, EECSBG, SEEARP).
- A minority of states invested all of their money in two or three programs that targeted one or two sectors.



12 Case Study States' Selected ARRA Program Budgets = \$1.3B

# Trends in Program Budget Priorities



- Public/Institutional Sector buildings
  - 25% of SEP funds nationally are targeted at building efficiency in the public/institutional sector
- Revolving loan funds to reinvigorate and retool industry for a clean tech economy were 9% of the case study budgets
- Less emphasis on residential markets – 12% nationally and 8% of total case study selected ARRA energy efficiency budgets went to residential programs



# Programs with Lasting Impacts

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- Financing programs have the potential to provide leverage, longevity, and flexibility
  - Revolving Loan Programs (RLF)
    - More than \$650 million
  - Loan Loss Reserves (LLR)
    - More than \$20 million
- Workforce training & development
- Codes and standards



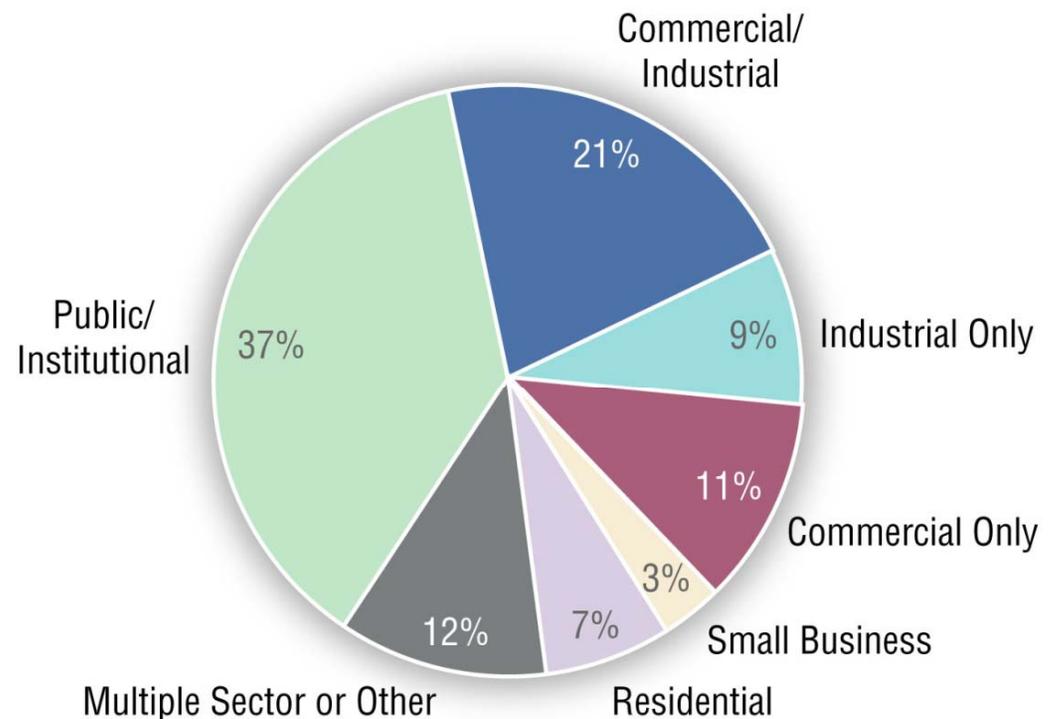
# Revolving Loan Funds



Thirty-five states have established 51 RLFs with over \$650 million in ARRA funds:

- Quick to set up, which met federal requirements for commitment of Recovery Act funds by 2010
- 44% for and industrial, commercial, and small business
- 37% for public/institutional markets
- Only 7% targeted at the residential market

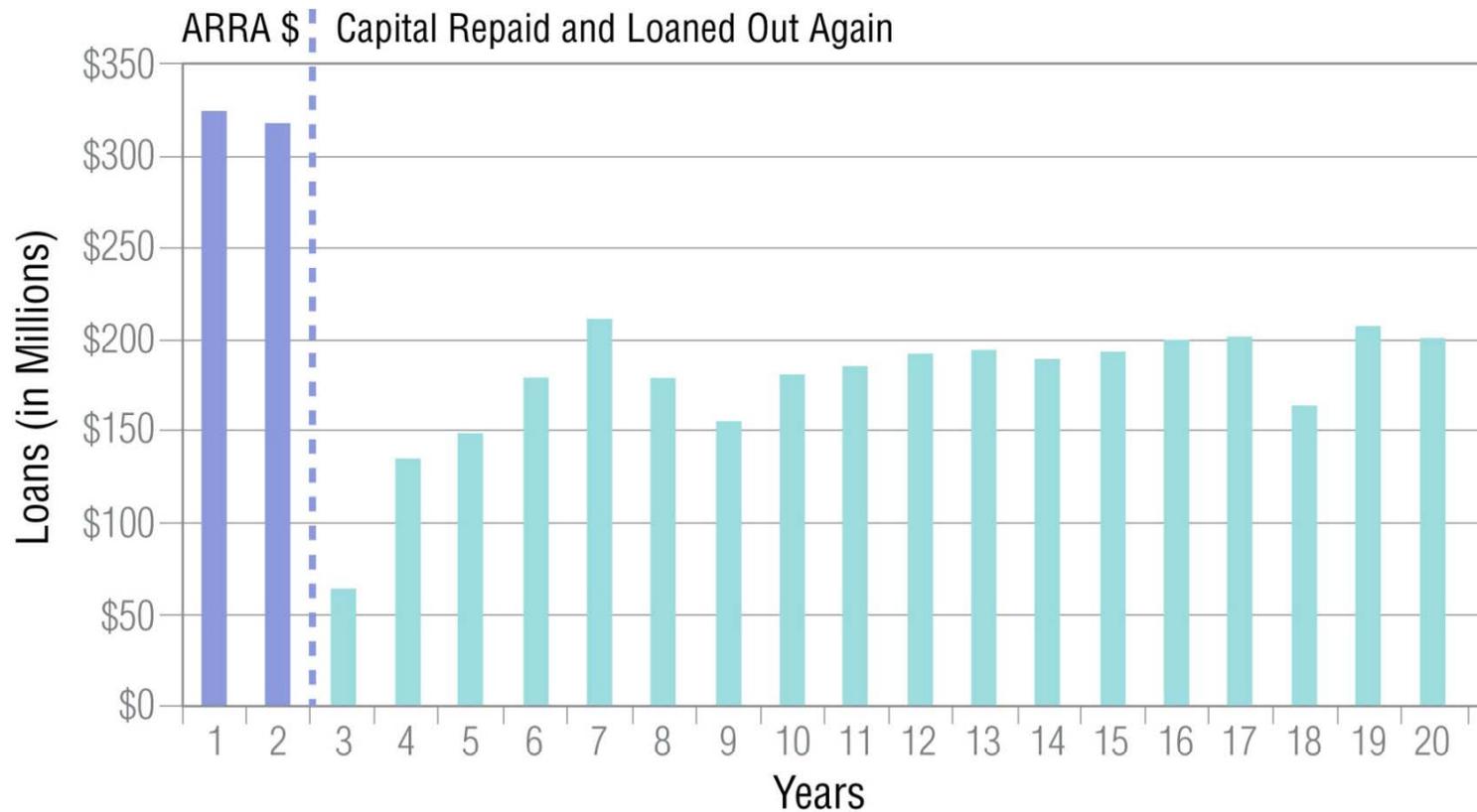
Target Sectors for ARRA-funded RLFs



# Longevity of Revolving Loan Funds



LBL estimates that RLFs could finance \$150-200 million per year of energy efficiency projects over the next 20 years.



# Loan Loss Reserve Funds

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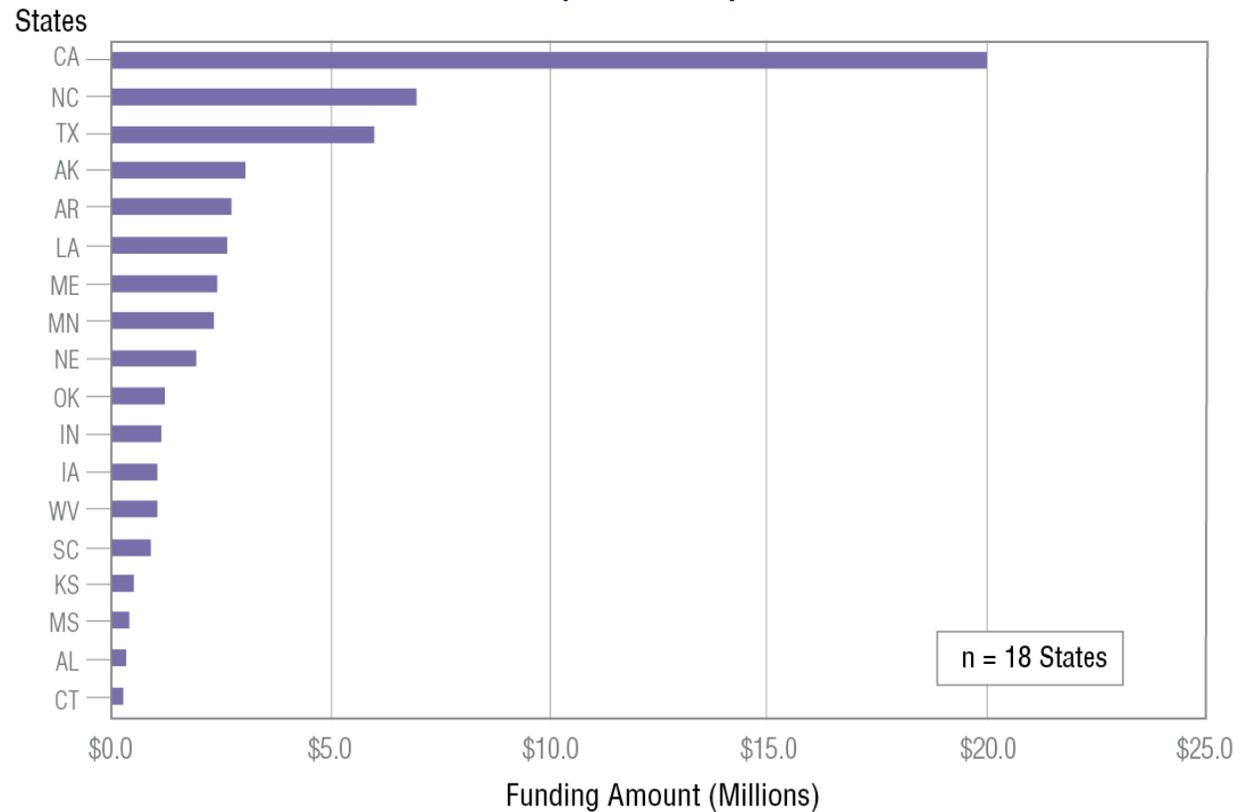
- At least 7 states and local governments also created loan loss reserves (LLRs):
  - More than \$20 million to support lending for energy efficiency projects
  - Loan loss reserve funds will not have the longevity of RLFs but provide significant immediate leverage of private funds
  - Utility customer-funded programs may want to consider similar financing programs once they have been “tested” with ARRA funds

# Workforce Training and Development



- 18 states invested over \$54 million in workforce development and training for the energy efficiency services sector and renewable energy industry
- Significant potential for spillover benefits for utility customer-funded programs

Spending on Workforce Training and Development by State





# Program Innovation and Exploration Among the States

# New Markets & Technologies



States targeted efficiency programs towards new markets, technologies, and geographic regions:

- Multi-fuel programs that fund improvements to the building envelope in oil-heated buildings (e.g., MA, MI, ME)
- Consumer behavior feedback experiments (e.g., HI)
- Transit-centric planning (e.g., HI, ME)
- Under-served rural areas (CO, CA)

New Sectors	New Geographic Areas	New Program Actors	New Technologies & Policies
<ul style="list-style-type: none"> <li>• HI (hospitality)</li> <li>• NY, NC (nonprofits)</li> </ul>	<ul style="list-style-type: none"> <li>• CO, CA (rural areas)</li> <li>• HI (non-IOU territory)</li> </ul>	<ul style="list-style-type: none"> <li>• CA (regional entities, counties)</li> <li>• MI (local governments)</li> <li>• MN (cities, local government authority)</li> <li>• NC (local nonprofits)</li> <li>• NY(cities)</li> <li>• WI (small towns)</li> </ul>	<ul style="list-style-type: none"> <li>• HI (deep seawater air conditioning)</li> <li>• ME, MA, MI (multi-fuel retrofits)</li> <li>• NY (reprogramming utility software for on-bill financing)</li> <li>• HI, ME (transit-centric planning)</li> </ul>



# Interaction and Coordination Among Program Administrators

# Spectrum of Coordination



In the 12 case study states there was a broad spectrum of coordination between state energy office & utility customer (UC) program administrators; multiple types of coordination were seen in the same state depending on the program or market:

- There was some degree of **inherent coordination** in situations where the SEO and the UC program administrators were the same entity
- They engaged in **consultation** with utility customer-program administrators but decided not to coordinate their programs
- **Complementary** Recovery Act-funded programs were designed as complements, enhancements, or extensions of utility customer programs
- Administrators tried **full collaboration** in designing and implementing joint programs

Inherent coordination	Communication or consultation on programs	Complementary programs	Full collaboration
ME, NY	FL, MN, NC, NY, WI	CA, CO, FL, HI, MA, ME, MI, MN, NC, NY, OR	HI, CA, ME, MA, MN

# Examples of Coordination



Type of Coordination	Example
<b>Inherent</b>	NYSERDA administers both ARRA and utility-customer funded programs
<b>Consultation</b>	Wisconsin developed a Revolving Loan Fund for industrial efficiency geared towards economic development; size and scope were outside the range of the existing, well-established utility customer-funded industrial program
<b>Complementary</b>	Colorado is launching a state-wide “one-stop shop” that may prove useful to utility programs after ARRA funding runs out
<b>Full Collaboration</b>	Hawaii delegated ARRA funds to the third-party administrator of utility customer programs to assume the existing solar hot-water heater rebate costs

# SEEARP Coordination

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Coordination on appliance rebates ranged from consultation to full collaboration

- Most case study states took a complementary approach
- Colorado developed a state-wide rebate cap and adjusted the ARRA rebate portion based on rebate levels of the various utility customer-funded programs across the state
- Hawaii used ARRA funds to add a refrigerator recycling program



# Benefits of Coordination

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Coordination between ARRA- and utility customer-program administrators offers potential benefits:

- Allows administrators to **leverage** existing resources, infrastructure and experience
- Both types of program administrators can influence program targeting, design and implementation issues to **mitigate market disruption** and consumer confusion
- Different administrators and funding sources can serve complementary purposes **best suited** to their skills and objectives
- Joint programs can have a broader support base than either taxpayer or utility customer programs on their own and may increase the **longevity** of programs





# Implications for the Future

## Challenges & Recommendations

# Ongoing Challenges

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- Funding and incentive fluctuations do not support long-term market transformation
- Varying program goals
  - ARRA goals of job retention and creation were not well aligned in some cases with utility customer-funded program primary goals of energy savings and market transformation
- Strain of time and capacity limits
  - Tight deadlines required unprecedented ramp-up from state and federal program administrators
  - Evolving guidance further strained capacity of state and local governments
- Recovery Act statutory requirements can limit coordination with utility customer-funded programs
  - “Fully integrated” utility/ARRA programs would need to meet all ARRA obligations

# Attribution of Savings & Impacts



Attribution is a critical issue for utility customer program administrators with performance incentives or Energy Efficiency Resource Standards

- Some states have not settled on exactly what to report and how to attribute savings
- A number of case study states have decided to give full credit for any savings achieved to the UC administrator, others have decided to give proportional, or strictly separate, the credit based on funding source/amount
- More refined state and utility reporting guidance could produce consistent approaches to estimating energy savings impacts claimed by multiple program administrators
- Progress toward EERS compliance by utility administrators may be accelerated by federal taxpayer dollars

Full credit of savings to UC administrator	Proportional credit of savings to UC administrator	Strict separation of ARRA & UC savings	Unresolved
CA, FL, MA, MI, MN, NC	HI, ME, WI	NY	CO, OR

# Recommendations for Existing Programs



- Track and share the performance of revolving loan fund programs that will last well beyond the ARRA performance
  - In future, provide TA to SEOs that want to modify their target markets for RLF in order to focus on underserved markets that most need project finance (e.g., residential, small business).
- Preserve the capacity, lessons learned, and practical know-how being developed at the state and local level



# Recommendations for Existing Programs



- Energy code updates and compliance efforts

- Recovery Act energy grants came with the expectation that states would implement the latest residential and commercial energy codes
- Evaluators may want to assess whether the level of SEP investment and effort in states to update their codes is consistent with meeting the Recovery Act's requirement to adopt the latest energy codes



# Recommendations for Future Programs

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- More funding for innovation in EE program design
  - The ARRA-funded SEP programs have explored and tested new EE program designs, partially because they are not constrained by some requirements faced by utility customer-funded energy efficiency programs
  - Continued support is needed to encourage innovative program designs, workforce development and market transformation initiatives
- Resource-efficient loading order
  - A “loading order” that encourages, or requires, customers to implement cost-effective efficiency measures prior to installing renewable energy systems should be evaluated as a best practice

# Recommendations for Future Programs

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- Coordination guidance

- Several state energy office and utility customer program administrator interviewees recommended that federal funds come with a coordination requirement

- Grant issuance and administration

- Sufficient time is needed to establish federal program guidance documents to streamline initial program ramp-up
- However, DOE has finalized guidance documents on key ARRA requirements and program administrators are now familiar with these requirements. Greater certainty here should open up more program & coordination opportunities if similar efforts are funded in the future



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# Background slides

# Increasing EE Spending



- Utility customer-funded energy efficiency program budgets are projected to increase to \$7.5-\$12 billion by 2020 (Barbose et al. 2009)
  - This spending is uneven; ten states currently account for nearly 80% of national spending on utility customer-funded energy efficiency
- 20 states have passed Energy Efficiency Resource Standards (EERS); 4 states considering EERS\*
  - Sets savings targets that will require a significant investment in energy efficiency



\*Adapted from ACEEE 2010. "State Energy Efficiency Resource Standard (EERS) Activity 2010."