



# Emerging Energy Efficiency Opportunities in the Built Environment

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## CONSULTING

- Engineering
- Sustainability
- Energy/Environmental Planning
- Financial Modeling
- Operational Modeling
- Commissioning



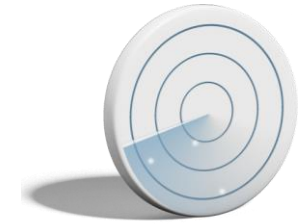
## CONSTRUCTION

- Mechanical
- Electrical
- Data
- Fire Protection
- Architectural Metals
- Telecommunications



## ENERGY

- Performance Based Contracting
- Smart Building Systems
- Active Energy Management
- Renewables
- Project Funding



## FACILITY SERVICES

- Mobile Service
- Maintenance Programs
- Remote Monitoring
- Knowledge Response Center
- Facility Management

# Quick Stats

- **80 billion square feet** of facility space (non-industrial) utilizes **70% of the electricity** in the United States.
- This represents **40% of all of U.S. CO<sub>2</sub> emissions**.
- From generation of a megawatt to delivery of kilowatts, **50% of energy is wasted** somewhere along the line or at the point of consumption.

# ACEEE EE Report – is the U.S. Improving?

Table 3. Summary of U.S. Energy Efficiency Indicators

Indicator	Status	Indicator	Status
Electricity and Natural Gas Efficiency Program Budgets		Disclosure of Energy Use in Buildings	
Annual Savings from Electricity and Natural Gas Efficiency Programs		Appliance and Equipment Performance Standards	
Energy Productivity		Energy Intensity of the Industrial Sector	
Mandatory Energy Efficiency Resource Standards (EERS)		Combined Heat and Power in Industry	
Greenhouse Gas Emissions		Energy Intensity of Freight Transport	
Energy Intensity In Residential Buildings		Fuel Economy of New Passenger Vehicles and Light Trucks	
Energy Intensity in Commercial Buildings		Use of Public Transit	
States with Updated Building Codes			

# ACEEE Ranking Results - State

Table ES-1. Summary of States' Total Scores

Rank	State	Utility & Public Benefits Programs & Policies (20 pts.)	Transportation Policies (9 pts.)	Building Energy Codes (7 pts.)	Combined Heat & Power (5 pts.)	State Government Initiatives (7 pts.)	Appliance Efficiency Standards (2 pts.)	TOTAL SCORE (50 pts.)	Change in rank from 2012	Change in score from 2012
1	Massachusetts	19	7.5	5.5	4.5	5.5	0	42	0	-1.5
2	California	15	7.5	7	3	6.5	2	41	0	0.5
3	New York	16	8	5.5	2.5	6	0	38	0	-1
4	Oregon	14.5	7	5.5	3.5	5.5	1	37	0	-0.5
5	Connecticut	14	5.5	5.5	4	6	1	36	1	1.5
6	Rhode Island	18.5	5.5	6	2	3	0.5	35.5	1	2.5
7	Vermont	18.5	4.5	5.5	2	4	0	34.5	-2	-1
8	Washington	13	7	6	2.5	4.5	0.5	33.5	0	1.5
9	Maryland	8.5	6	5.5	2	5	0.5	27.5	0	-2.5
10	Illinois	9.5	4	5.5	2	5	0	26	4	1
11	Minnesota	15	2	3	1	4.5	0	25.5	-2	-4.5
12	New Jersey	8.5	6	4	2.5	3.5	0	24.5	4	0
12	Arizona	12	2.5	3.5	2.5	3.5	0.5	24.5	0	-1
12	Michigan	11	3	4	2	4.5	0	24.5	0	-1
12	Iowa	12	2	5.5	1.5	3.5	0	24.5	-1	-2
16	Maine	10.5	6	2.5	2	2	0	23	9	4
16	Colorado	10.5	2	4.5	1.5	4.5	0	23	-2	-2
18	Ohio	11	0	4	3.5	4	0	22.5	4	3
19	Pennsylvania	6	6	4	1.5	4.5	0	22	1	0.5
20	Hawaii	10	2.5	4	0.5	3.5	0	20.5	-2	-1.5

# ACEEE Ranking Results - Cities

Table ES-1: Summary of City Scores

Rank	City	State	Local Government Operations (15 pts.)	Community-Wide Initiatives (10 pts.)	Buildings Policies (29 pts.)	Energy & Water Utility Policies and Public Benefits Programs (18 pts.)	Transportation Policies (28 pts.)	TOTAL SCORE (100 pts.)
1	Boston	MA	11	9.5	21.5	15.75	19	76.75
2	Portland	OR	13.75	7.5	14.5	14.75	19.5	70
3	New York City	NY	10.5	9	22	15.25	13	69.75
3	San Francisco	CA	13	8	17	15.75	16	69.75
5	Seattle	WA	10.75	6	22.5	14.75	11.25	65.25
6	Austin	TX	9.75	9	21.5	10.75	11	62
7	Washington	DC	8.25	4	21	8.75	14	56
8	Minneapolis	MN	10	6.5	10	13.75	15	55.25
9	Chicago	IL	10.75	8	12	13.5	10.5	54.75
10	Philadelphia	PA	10.5	8.5	11.5	8.5	15.5	54.5
11	Denver	CO	11	7.5	7.5	14.25	12.5	52.75

# ACEEE Suggested LG Opportunities

- Lead by example
- Adopt energy savings targets
- Actively manage energy performance
- Adopt policies to improve efficiency in new and existing buildings
- Partner with energy and water utilities to expand programs

# General Benefits of Energy Efficiency

- Reduce GHG emissions
- Reduce costs
- Demonstrate leadership
- Increase economic benefits through job creation and market development
- Improve indoor air quality and productivity
- Engage the community



# Performance-Based Investment Opportunities

## Energy Performance Labeling

- Knowledge is power - MPG for buildings, understand performance
- Public disclosure – market adoption, new norm
- Other infrastructure EUIs – water, waste, etc.?

## Evolved Procurement Methods

- Performance-based outcomes over time, not design or first cost – new or retrofit, use integrated teams

## Utility Pay-for-Performance Incentives

- Paid on delivery of energy efficiency over time, not only upfront/prescriptive

## Outcome-Based Energy Codes

- Focused on performance and how buildings use energy once completed (existing), not building characteristics compared to a theoretical building built to a code baseline – measure and enforce actual usage!
- Operational and tenant energy use become part of the opportunity
- LEED v.4 more outcomes-based, how to manage buildings

# Thank you!



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