



Efficiency Maine Commercial Baseline Study Results



Tasks

- Sample Design
- Site Selection
- Recruiting
- Site Visits
- Data Cleaning and Entry
- Code Compliance
- Energy Use Intensity Comparison
- Data Analysis
- Report Writing



Sample Design

- Sample Design
 - Dodge Database – 2006 – 2010
 - Building Types
 - Grocery, Office, Retail, Warehouse, Hotel, Bank/Financial, K-12 Schools, Residence Hall (Dorm)
 - Size – **57 sites** (90% confidence level plus or minus 10%)



Site Selection

Population – Number of New Starts 2006 - 2011

Building Type	Building Size		Total
	Medium Commercial	Small Commercial	
Bank/financial institution		47	47
Grocery store	7	2	9
Hotels and motel	8	3	11
K-12 school	11	13	24
Office building	4	63	67
Residence hall/dormitory	6	24	30
Restaurant	1	57	58
Retail store	7	82	89
Warehouse	5	41	46
Total	49	332	381

Source: Dodge Database (Excludes Salt/Sand Storage Buildings)



Site Selection

Regions

Study Region	County
East	Hancock
East	Penobscot
East	Waldo
East	Washington
Central	Androscoggin
Central	Kennebec
Central	Knox
Central	Lincoln
Central	Sagadahoc
North	Aroostook
South	Cumberland
South	York
West	Franklin
West	Oxford
West	Piscataquis
West	Somerset



Site Selection

- Oversampling
 - 23 Additional Sites for Geographic Coverage
 - Target of 80



Site Selection

Final Target by Building Type

Building Type	Total
Banks/financial institution	8
Grocery store	2
Hotels and motels	6
K-12 school	7
Office building	12
Residence hall/dormitory	9
Restaurant	10
Retail store	16
Warehouse	10
Grand total	80



Site Selection

Sample to Population Comparison

Building Type	Sample	Population
Bank/financial institution	10.0%	12.3%
Grocery store	2.5%	2.4%
Hotels and motel	7.5%	2.9%
K-12 school	8.8%	6.3%
Office building	15.0%	17.6%
Residence hall/dormitory	11.3%	7.9%
Restaurant	12.5%	15.2%
Retail store	20.0%	23.4%
Warehouse	12.5%	12.1%
Total	100.0%	100.0%



Recruitment/Site Visits

- Calls Made by Surveyors
 - Chains Most Difficult Schedule
- Site Surveys
 - Had to Dig for Plans & Specifications
 - Difficult Determining Insulation Levels
 - Below Grade
 - Within Wall Cavities



Recruitment/Site Visits

Final Count by Building Type

Building Type	Number of On-Site Survey Participants	Percent of Total Participants
Banks/Financial Institution	8	10.8%
Grocery Store	6	8.1%
Hotels and Motels	5	6.8%
K-12 School	6	8.1%
Office Building	14	18.9%
Residence Hall/Dormitory	7	9.5%
Restaurant	5	6.8%
Retail Store	12	16.2%
Warehouse	11	14.9%
Totals	74	100.0%



Recruitment/Site Visits

Surveys by Region

Region	Number of On-Site Survey Participants	Percent of Total On-Site Surveys	Percent of Population
South	32	43%	54%
East	16	22%	15%
Central	15	20%	23%
West	7	9%	6%
North	4	5%	2%
Total	74	100%	100%



Recruitment/Site Visits

Surveys by Building Size

Building Size	Number of On-Site Survey Participants
Small commercial	53
Medium commercial	21
Total	74



Energy Use Intensities

Table 1: Distribution of Buildings

Distribution of Buildings		
Building Type	Buildings Included in the 2011 Baseline Study	Buildings Included in the 2011 EUI Study
Banks/Financial Institution	8	4
Grocery Store	6	6
Hotels and Motels	5	4
K-12 School	6	5
Office Building	14	7
Residence Hall/Dormitory	7	4
Restaurant	5	2
Retail Store	12	4
Warehouse	11	3
Totals	74	39



Energy Use Intensities

Table 2: Baseline Study EUI Summaries

Baseline Study EUI Summaries				
Building Type	Average	CBECS* Standards	Percent Relationship to the CBECS Standards	Number of Buildings
Banks/Financial Institution	105.6	100.8	105%	4
Grocery Store	214.5	199.7	107%	6
Hotels and Motels	64.2	126.7	51%	4
K-12 School	46.2	87.7	53%	5
Office Building	82.2	120.1	68%	7
Residence Hall/Dormitory	64.3	126.7	51%	4
Restaurant	714.3	276.6	258%	2
Retail Store	72.7	108.4	67%	4
Warehouse	30.2	30.2	100%	3
Totals				39



Energy Use Intensities

Table 3: Baseline Study Electric EUI Summaries

Baseline Study Electric EUIs				
Building Type	Average	CBECS* Standards	Percent Relationship to the CBECS Standards	Number of Buildings
Banks/Financial Institution	17.8	6.9	258%	7
Grocery Store	40.3	49.4	82%	6
Hotels and Motels	9.6	13.5	71%	4
K-12 School	4.3	11	39%	6
Office Building	7.4	17.3	43%	8
Residence Hall/Dormitory	8.4	13.5	62%	4
Restaurant	143.4	38.4	373%	2
Retail Store	10.1	14.3	71%	6
Warehouse	5.6	7.6	74%	6
Totals				49

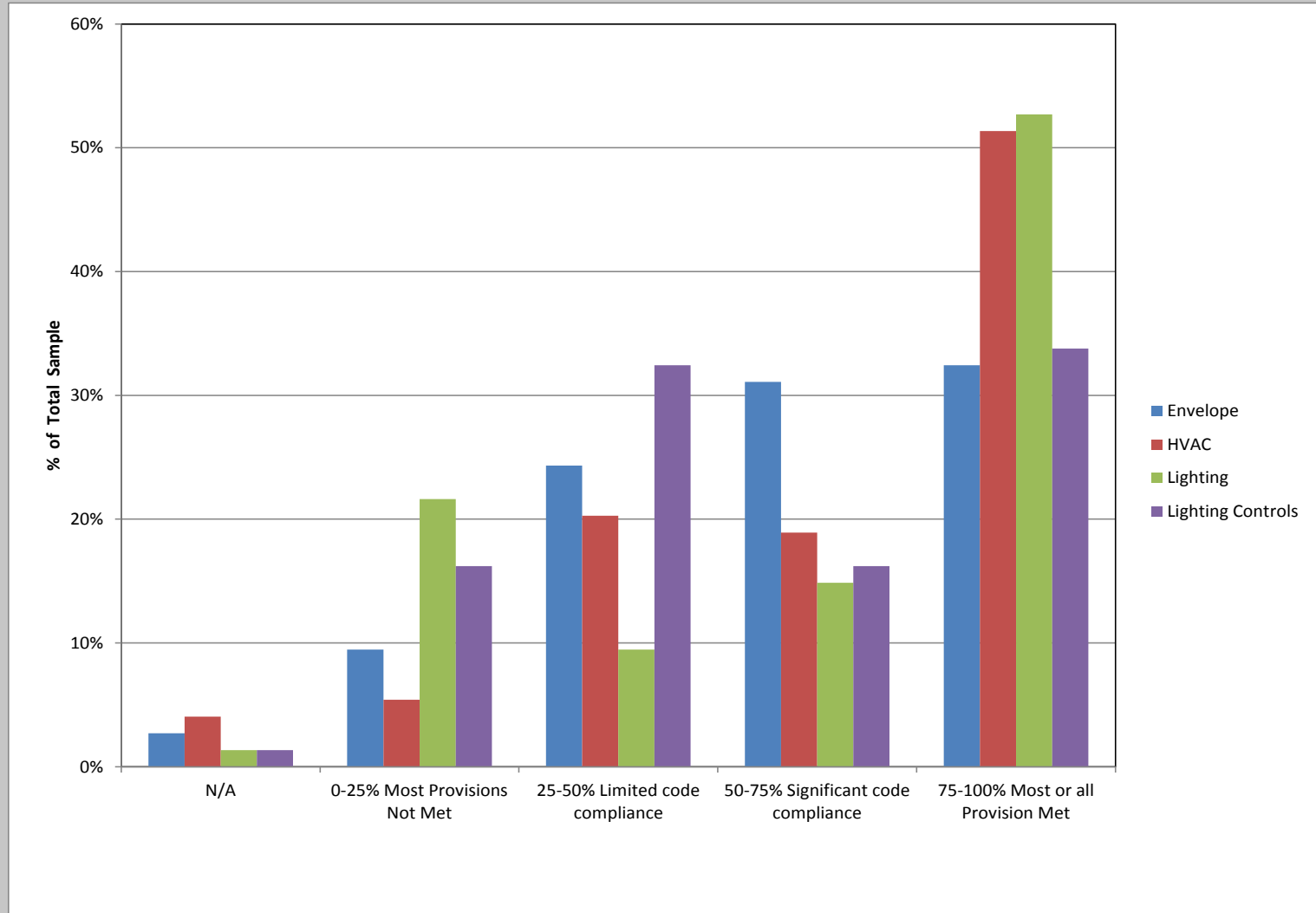


Incentives by Building Type

Program Type	# of Participants	# of Projects	Total Incentive Paid	% of Total Incentives Paid	kWh Savings	% of Total kWh Savings	kW Savings	Participant Costs
Agriculture	178	313	\$411,263.22	2%	6,896,409.03	3%	1,772.09	\$1,039,730.09
College	25	148	\$634,994.02	2%	5,267,311.69	3%	1,201.14	\$1,613,919.30
Convenience Stores	111	178	\$200,848.42	1%	1,347,451.23	1%	217.35	\$528,008.58
Elementary/Secondary Schools	216	805	\$3,002,840.80	12%	16,707,428.27	8%	6,020.58	\$7,882,619.76
Garage/Repair	29	34	\$18,913.00	0%	152,244.80	0%	50.38	\$62,046.00
Grocery Store	107	224	\$1,113,487.09	4%	7,122,825.44	3%	1,192.26	\$2,162,129.27
Health	153	191	\$714,661.21	3%	3,913,013.10	2%	924.59	\$1,707,547.51
Hospital	33	96	\$806,322.62	3%	4,227,537.69	2%	741.47	\$2,339,371.63
Lodging	138	215	\$264,728.64	1%	4,160,323.47	2%	1,037.04	\$794,014.13
Manufacturing	475	882	\$7,618,708.14	30%	76,086,790.42	36%	10,527.06	\$21,451,405.68
Office	686	1088	\$2,312,880.22	9%	12,792,505.47	6%	3,454.77	\$5,915,971.90
Other	1122	1655	\$4,443,612.86	17%	30,555,084.00	15%	11,905.85	\$13,125,134.95
Restaurant	131	156	\$126,004.37	0%	885,803.66	0%	233.72	\$312,303.51
Retail	534	853	\$1,995,663.37	8%	20,757,363.00	10%	5,066.73	\$5,476,764.05
Warehouse	399	518	\$1,781,599.75	7%	19,242,175.84	9%	3,959.07	\$6,358,899.34
Totals:	3778	7356	\$25,446,527.73		210,114,267.10		48,304.10	\$70,769,865.69



Code Compliance





Code Compliance

Envelope Compliance

	Bank/ Financial Institute	Grocery Store	Hotel	K-12 School	Office Building	Residential Hall/ Dormitory	Restaurant	Retail Store	Warehouse	Grand Total
0								1	1	2
0-25% Most Provisions Not Met					1		1	2	3	7
25-50% Limited code compliance	2		2	1	5		1	5	2	18
50-75% Significant code compliance	3	3	3	1	5	1	3	3	1	23
75-100% Most or all Provision Met	2	1		6	6	5	1	1	2	24
Grand Total	7	4	5	8	17	6	6	12	9	74



Code Compliance

HVAC Compliance

	Bank/ Financial Institute	Grocery Store	Hotel	K-12 School	Office Building	Residential Hall/ Dormitory	Restaurant	Retail Store	Warehouse	Grand Total
0					1			1	1	3
0-25% Most Provisions Not Met		1			2				1	4
25-50% Limited code compliance			3		2	1	2	5	2	15
50-75% Significant code compliance	2		1		3	1	2	2	3	14
75-100% Most or all Provision Met	5	3	1	8	9	4	2	4	2	38
Grand Total	7	4	5	8	17	6	6	12	9	74



Code Compliance

Lighting compliance

	Bank/ Financial Institute	Grocery Store	Hotel	K-12 School	Office Building	Residential Hall/ Dormitory	Restaurant	Retail Store	Warehouse	Grand Total
0					1					1
0-25% Most Provisions Not Met	2			1	5		2	3	3	16
25-50% Limited code compliance	1		1		2			2	1	7
50-75% Significant code compliance	2	1	2		1		4	1		11
75-100% Most or all Provision Met	2	3	2	7	8	6		6	5	39
Grand Total	7	4	5	8	17	6	6	12	9	74



Code Compliance

Lighting Controls

	Bank/ Financial Institute	Grocery Store	Hotel	K-12 School	Office Building	Residential Hall/ Dormitory	Restaurant	Retail Store	Warehouse	Grand Total
0									1	1
0-25% Most Provisions Not Met	1	1	1	1	1	1	1	2	3	12
25-50% Limited code compliance	4		1	1	5	2	3	6	2	24
50-75% Significant code compliance		1	2	2	4		1	1	1	12
75-100% Most or all Provision Met	2	2	1	4	7	3	1	3	2	25
Grand Total	7	4	5	8	17	6	6	12	9	74



Findings & Recommendations

- Construction Practices Highly Variable
- Envelope
 - Building Science
 - Insulation Installation
 - Walls Cavities
 - Coverage
 - Thermal breaks (continuous)
 - Below Grade & Slabs
 - NFC Rating System Training



Findings & Recommendations

- Mechanical Systems
 - Sizing and Design
 - System Controls
- Lighting
 - Design for Lower LPD's.
 - LED & Other New Technologies
- Lighting Controls
 - Training and Technical Assistance



Wrap Up

- Comments
- Next Steps