

Lessons Learned from LED Baseline Development across Multiple Regions

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2015 IEPEC Conference — Long Beach, California

Discussion Overview

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_	Conclusions	

Baseline Study Overview

 Baselines developed as part of two LED market effects studies: California (2014) and Massachusetts (2015)



and

Cross-Regional Study Approach: Objectives and Methods

Objectives



- Establish baseline conditions for LEDs in three regions in support of a future market effects study.
- Research key market indicators:
 - Market Share of LEDs
 - Availability
 - Pricing
 - Customer/Vendor Perceptions and Barriers
- Compare the California and Massachusetts baselines to a selected comparison area.



 MA Commercial Market Assessment (CATI and on-site)

Cross-Regional Study Approach: Comparison Area Selection

- Comparison area selection criteria
 - Absence of large-scale utility programs supporting LED lighting
 - Demographic and Firmographic comparison to California
 - Population of commercial establishments by industry and size
 - Distribution of commercial establishments by industry and size
 - Energy prices
 - Urbanization



Measures of Adoption

- Measures of adoption are a key market indicator in determining market effects
- Can be developed with multiple data sources; each has strengths and weaknesses that must be considered in regard to specific products, services, and markets under study
- Some kinds of data are only available for certain products and channels: e.g. point of sale data for residential lighting and appliances

	Market Share	Rate of Adoption	Saturation
	Description	Description	Description
	Portion of total sales of a product type accounted for by the technology of interest	Percentage of customers with at least one unit of the technology of interest	Percentage of installed inventory comprised of the technology of interest
Phone Surveys	N/A		
Customer On-Site Surveys			
Vendor Survey			
or Panel			
	Limited Applicability	Feasible Data Source	Good Data Source

Specifics of Primary Research Featured in these Studies

Data Collection Effort		Sample Sizes and Survey Dates						
	Survey Method	California Massachusetts		Comparison Area				
OVERARCHING MARKET ISSUES AND TRENDS								
Local Program Managers	IDI		4		11			
National Program Managers	IDI		12					
Analysis of Product Databases/Secondary Literature Review			Х		x		Х	
Analysis of Massachusetts Building Codes			x	Х			х	
Processing of PA program databases			X	Х			x	
NON-RESIDENTIAL MARKET								
Installation Contractors	CATI	94*	2013	43	Q1 2014	64	Q3-Q4 2013	
Designers/Specifiers	IDI	19	Q3 2013	10	Q1-Q2 2014	20	Q3 2013	
Distributors	IDI	20	Q3 2013	10	Q1-Q2 2014	18	Q3 2013	
Non-Residential End-Use Customers	CATI	3,320*	Q4 2011-Q3 2013	617*	Q4 2013-Q1 2014	384	Q3-Q4 2013	
* Coordination with other studies								

Rate of Adoption: Customer Phone Survey Results

Overall Rate of LED Adoption	California (n=1,770)	Massachusetts (n=617)	Comparison Area Area(n=384)
Businesses that have installed LEDs since 2009 ^a (Population-weighted)	32%	39%	33%
Businesses that have installed LEDs since 2009 ^{a, c} (Size Weighted by Consumption or Employment)	46%	63%	42%

Lamp or Fixture Type			
(Consumption or Employee-Weighted)	California (n=361)	Massachusetts (n=120)	Comparison Area Area(n=157)
Screw-in Bulbs ^{a,c}	12%	42%	13%
Spotlight/Downlight LEDs ^c	17%	14%	10%
Overhead Luminaire for General Lighting	6%	12%	6%

Rate of adoption in Massachusetts is significantly higher than in California and the comparison area.

- a- Difference between California and Massachusetts is significantly different at 90%
- c- Difference between Comparison Area and Massachusetts is significally different at 90%

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Rate of Adoption: Comparison of Massachusetts Phone and On-Site Results



On-Site surveys corroborated finding that there is a higher level of LED adoption in Massachusetts.

Saturation: On-Site Survey Results

Linear Lamp Type (site Weighted) T12 4% 9% 14% 8% 30% T5 3% 1% 3% 84% 85% 70% LED 0.1% <0.1% 0.1% 0.1% 0.0% Other 2% <0.1% 0.1% 0.0% 0.0% Massachusetts (n=302) California (n=206) California Miscellaneous (n=217) California Retail (n=195) California Restauran (n=163) Lamp Type (site-Weighted) CFL 444% 67% 64% 37% 52% Halogen 10% 9% 12% 32% 9% Incandescent 24% 22% 22% 17% 29%			Massachusetts All buildings (n=323)	California Office (n=237)	California Miscellaneous (n=228)	California Retail (n=219)	California Restaurant (n=170)
Linear Lamp Type (site Weighted) T8 90% 90% 84% 85% 70% T5 3% 1% 3% 8% 1% LED 0.1% <0.1% 0.1% 0.0% Other 2% <0.1% 0.1% 0.0% Massachusetts All Buildings (n=302) California Office (n=206) California Miscellaneous (n=217) California Retail (n=195) California Restauran (n=163) Lamp Type (Site-Weighted) CFL 44% 67% 64% 37% 52% Halogen 10% 9% 12% 32% 9% Incandescent 24% 22% 22% 17% 29% LED 23% 2% 2% 13% 5%		T12	4%	9%	14%	8%	30%
Type (Site Weighted) T5 3% 1% 3% 8% 1% LED 0.1% <0.1% 0.1% 0.1% 0.0% Other 2% <0.1% <0.1% 0.0% 0.0% Massachusetts All Buildings (n=302) California Office (n=206) California Miscellaneous (n=217) California Retail (n=195) California Restauran (n=163) Lamp Type (Site-Weighted) CFL 44% 67% 64% 37% 52% Halogen 10% 9% 12% 32% 9% 17% 29% LED 23% 2% 2% 13% 5%	Linear Lamp	Т8	90%	90%	84%	85%	70%
LED 0.1% 0.1% 0.1% 0.0% Other 2% <0.1%	Туре	Т5	3%	1%	3%	8%	1%
Other 2% <0.1%	(Site Weighted)	LED	0.1%	<0.1%	0.1%	0.1%	0.0%
Lamp Type (Site-Weighted)CFL44% 44%67% 9%California Miscellaneous (n=217)California Retail (n=195)California Restaurant (n=163)Lamp Type (Site-Weighted)CFL44% 44%67% 9%64%37% 32%52% 9%Incandescent24% 22%22%22%17% 29%29%LED23% 2%2%2%13%5%		Other	2%	<0.1%	<0.1%	0.0%	0.0%
Lamp Type (site-Weighted)CFL44%67%64%37%52%Halogen10%9%12%32%9%LED23%2%2%13%5%							
Lamp Type (Site-Weighted) CFL 44% 67% 64% 37% 52% Halogen 10% 9% 12% 32% 9% Incandescent 24% 22% 22% 17% 29% LED 23% 2% 2% 13% 5%			Massachusetts All Buildings (n=302)	California Office (n=206)	California Miscellaneous (n=217)	California Retail (n=195)	California Restaurant (n=163)
Lamp Type (Site-Weighted) Halogen 10% 9% 12% 32% 9% Incandescent 24% 22% 22% 17% 29% LED 23% 2% 2% 13% 5%		CFL	44%	67%	64%	37%	52%
Incandescent 24% 22% 22% 17% 29% LED 23% 2% 2% 13% 5%	(Site-Weighted)	Halogen	10%	9%	12%	32%	9%
LED 23% 2% 2% 13% 5%		Incandescent	24%	22%	22%	17%	29%
		LED	23%	2%	2%	13%	5%

Proportion of LEDs in socket-based applications is similar to rate of adoption. Saturation of LEDs in linear fixtures is lower than identified rate of adoption for this technology.

Market Share: Contractor Results



Contractor results suggest limited market share of LEDs in all regions and higher shares of LEDs in non-linear applications present in Massachusetts.

Conclusions

Results



Interpretation of Results

- The three measures of adoption are not 100% equivalent but show similar trends:
 - Massachusetts high rate of adoption and market share suggest strong program effects
 - Similar results in California and the comparison area suggest adoption driven by normal market forces

Strengths and Limitations of Approach

Strengths

- Provides value for program planning and EM&V
- Multi-faceted approach provides multiple measures of adoption

Limitations

- Heavy reliance on customer and vendor self-reports
- Requires care is taken in study design to account for timeliness, replicability, and comparability across regions
- Difficulty in finding pure comparison areas without program influence

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