

State of the Commercial Lighting Market in Vermont

Better Buildings by Design 2015

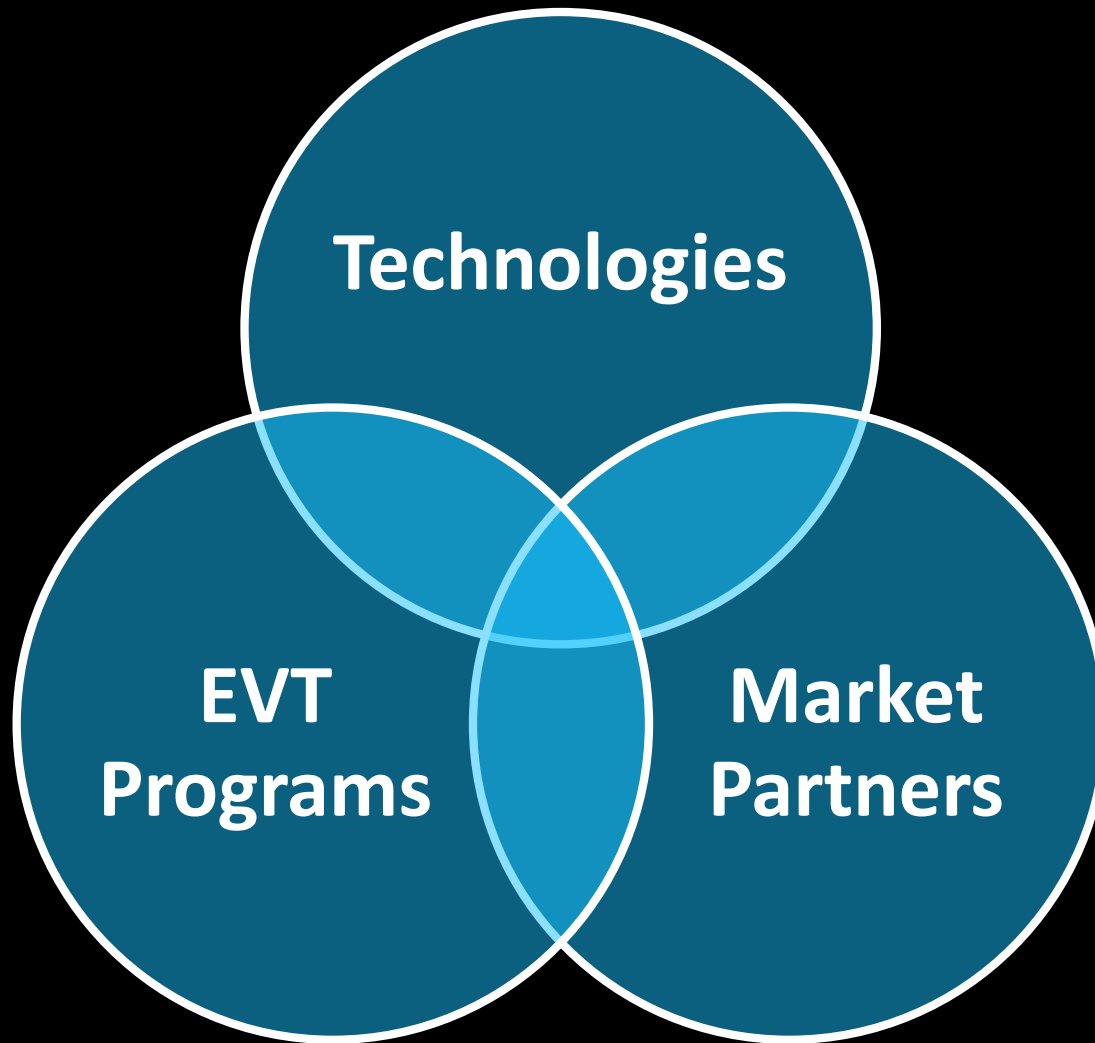


Dan Mellinger
February, 2015

Session Objectives

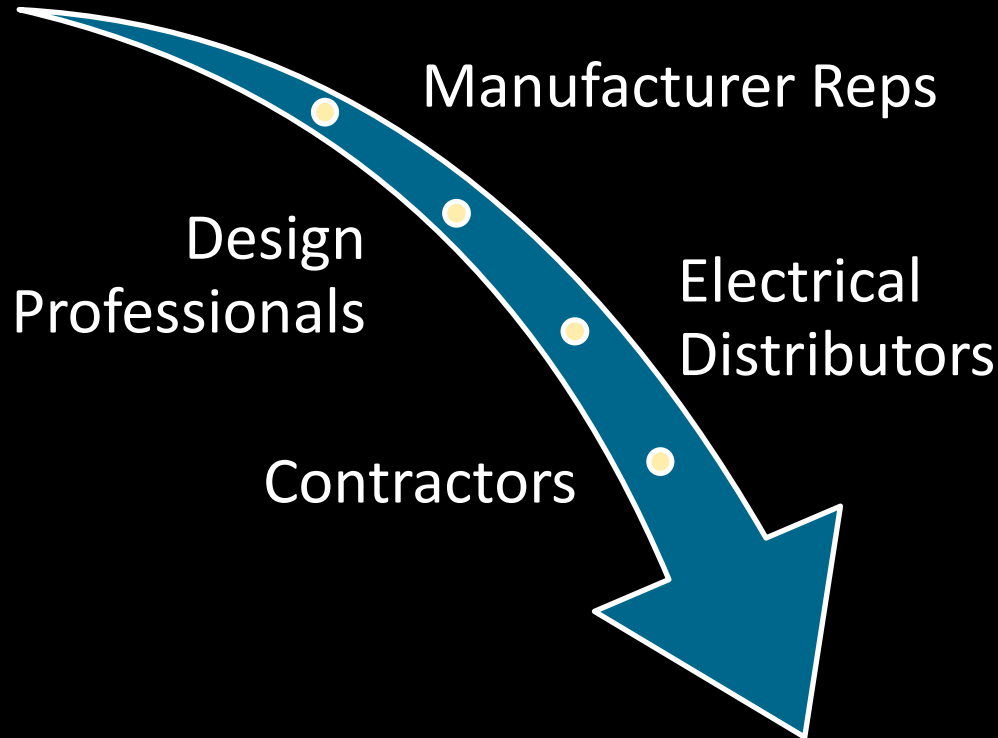
- Define the existing **market penetration** of various commercial lighting technologies
- Identify the LED product categories that have the greatest **future potential** in Vermont
- Compare the **economic opportunity** of various LED product categories
- Summarize the **market strategies** that will be used to capture remaining energy savings

Vermont Commercial Lighting Market



C&I Lighting Market: Partners

Manufacturers



Manufacturer Reps

Design Professionals

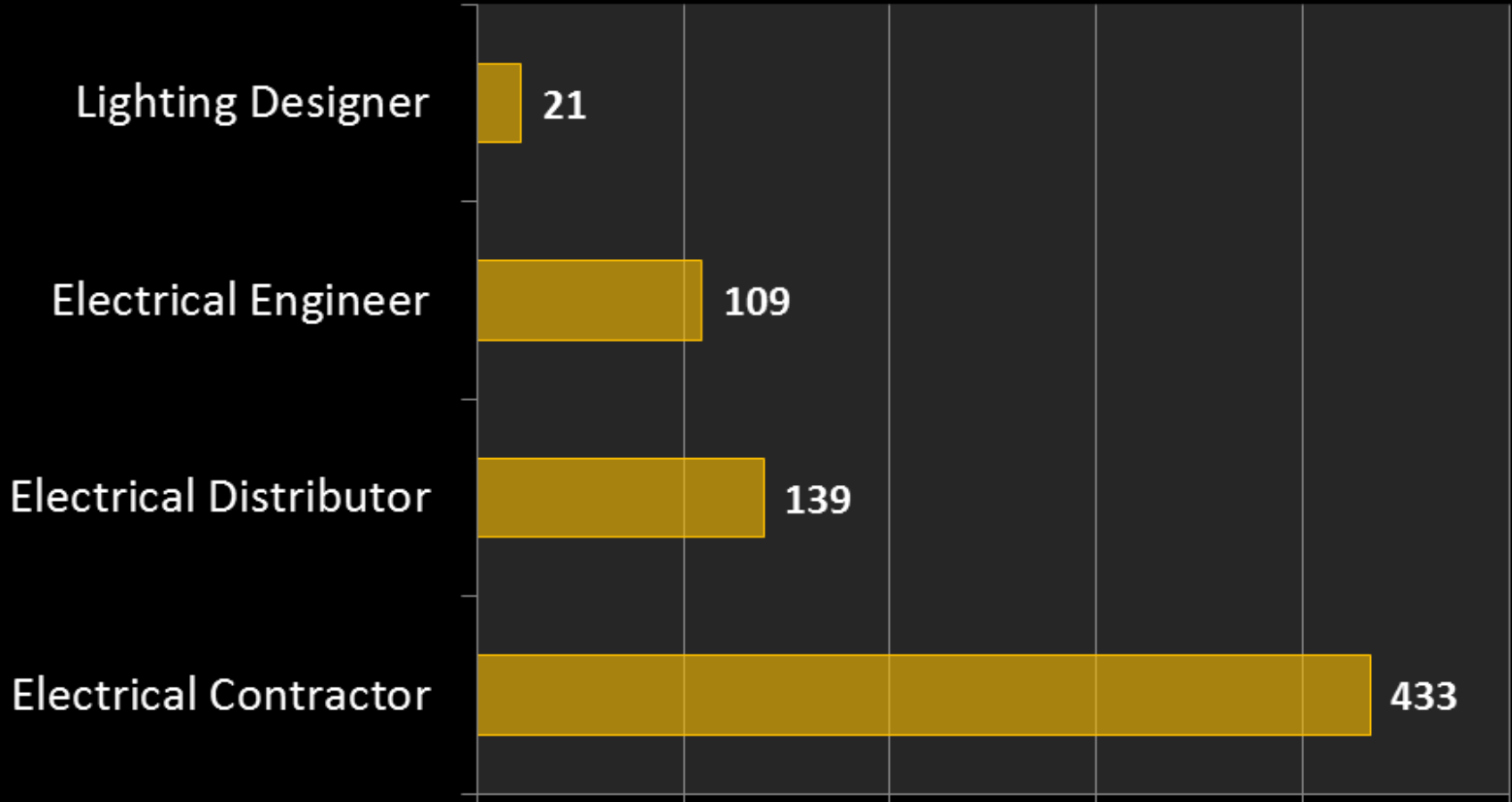
Electrical Distributors

Contractors

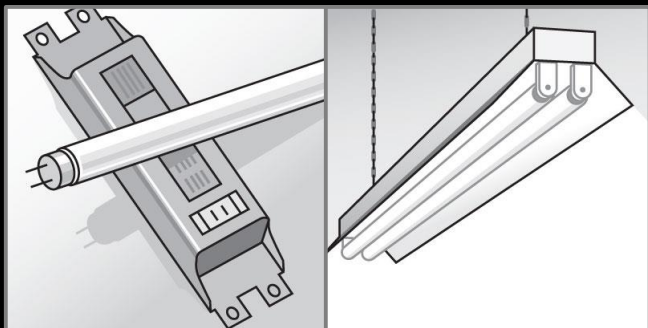
Commercial & Industrial
(C&I) Customers

VT C&I Lighting Market Partners, 2000-2014

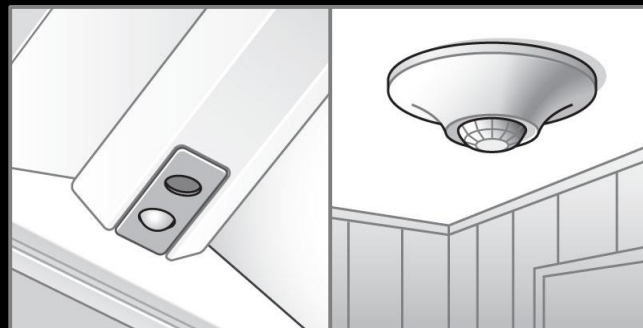
(Linked to at Least One Completed EVT Project)



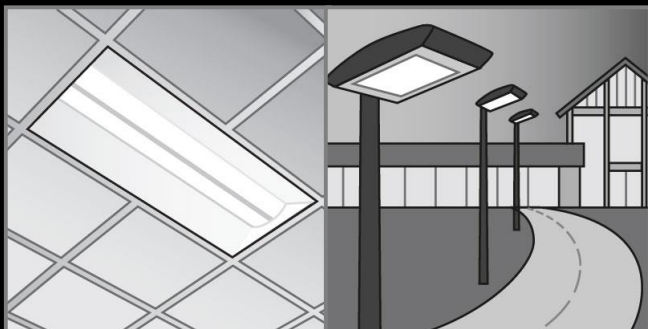
C&I Lighting Market: Technologies



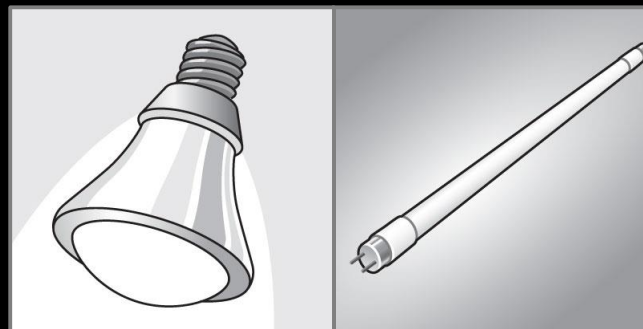
Fluorescent HPT8 & T5



Lighting Controls



LED Fixtures



LED Lamps

C&I Lighting Market: Efficiency Vermont Programs

Standard Rebate Program

Prescriptive Rebate
Forms

Business Rebate Center
www.encyvermont.com

SMARTLIGHT
("Upstream" Rebates)

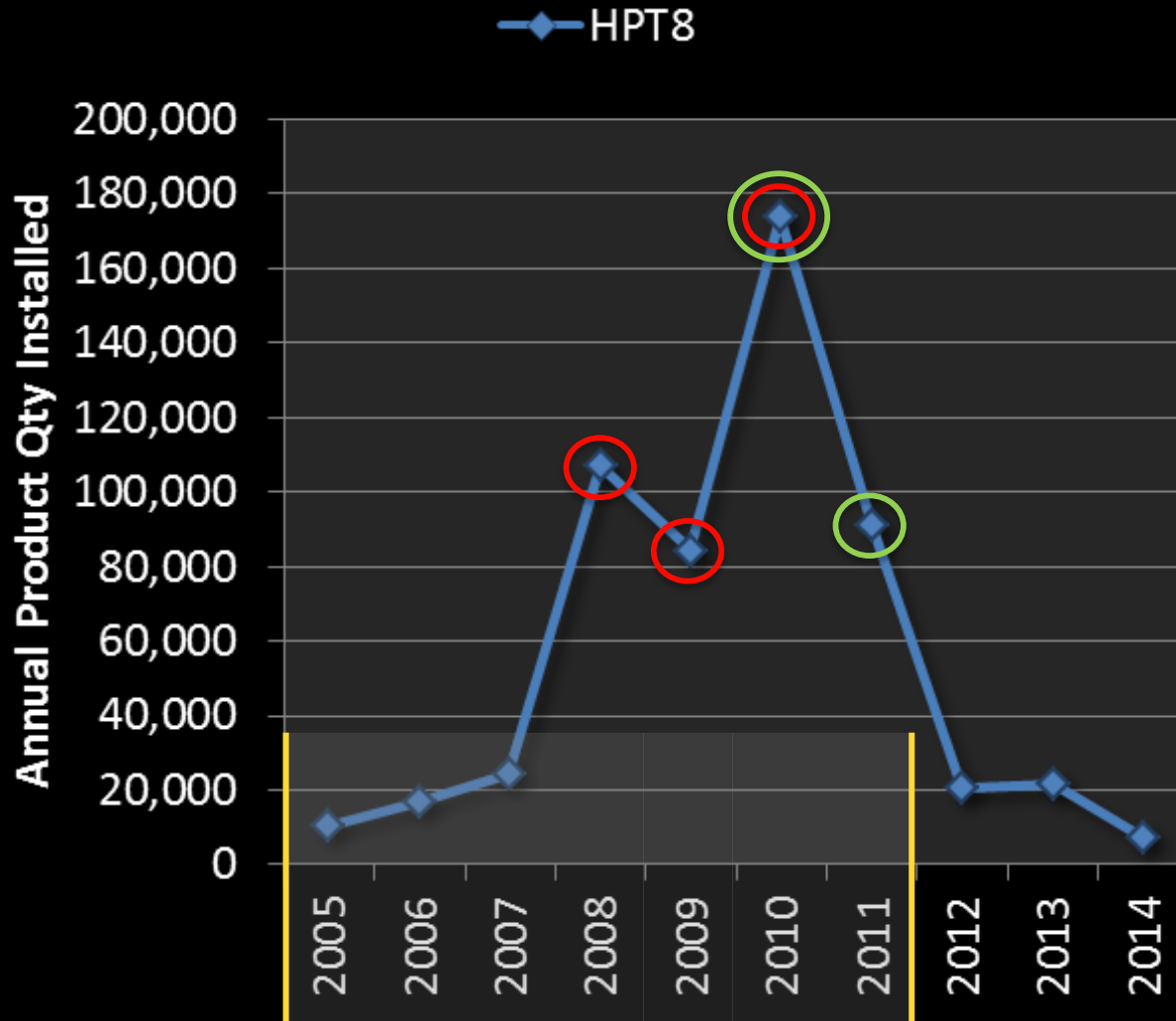
Custom Incentive Program

Custom Lighting

RELIGHT
(Lighting Design)

Municipal Street
Lighting

C&I Lighting Product Adoption



newLIGHT Program

Lighting Plus Program

HPT8 Education & Promotion

C&I Lighting Product Adoption

—▲ LED - Exterior —■ LED - Screw Base

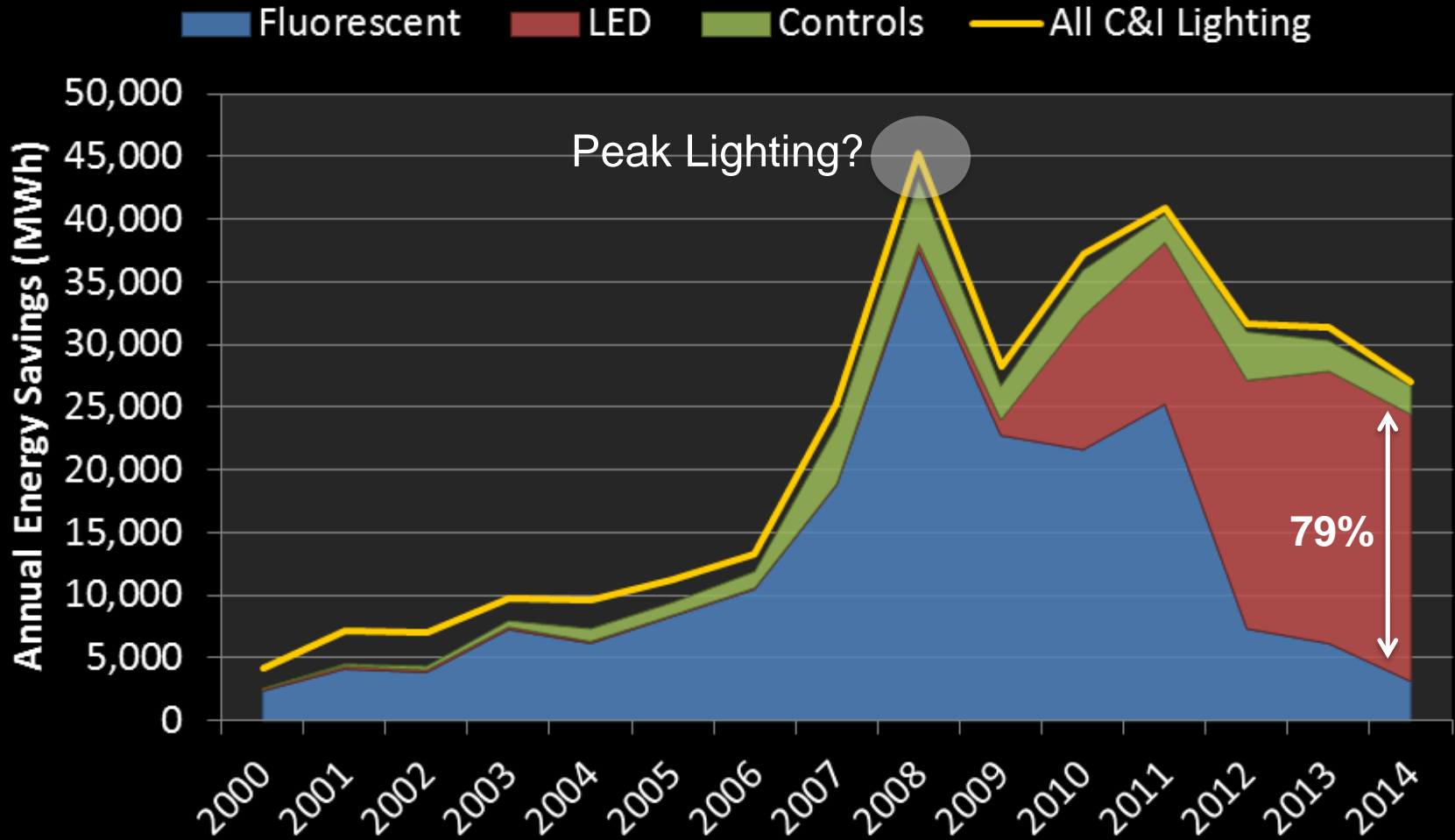


SMARTLIGHT
Program

Lighting Plus
Program

LED Education
& Promotion

Efficiency Vermont C&I Lighting Savings



We Know What We've Achieved, But...

What does this information tell us about the level of market transformation?

- Do we even know the size of the market?

What do we know about the future level of attainable savings?

- “Past performance is not an indicator of future outcome”

How can we develop strategies when we don't even have a complete understanding of the market?

Vermont Lighting Market Analysis Goals

1. Estimate the **market penetration** in Vermont for commercial & industrial (C&I) lighting measures

➤ *Market penetration* (or market share):

Amount of sales or **adoption of a product**

The **total theoretical market** for that product

➤ Example: Apple has 42% share of the U.S. smartphone market

Vermont Lighting Market Analysis Goals

1. Estimate the **market penetration** in Vermont for commercial & industrial (C&I) lighting measures
2. Identify future **attainable savings potential**
3. Use market analysis insight to shape **long term goals and strategies**

Market Analysis

Future Potential

Strategies

Sources Used

National

- *U.S. Lighting Market Characterization (Navigant, 2010)*
- *Adoption of Light-Emitting Diodes in Common Lighting Applications (Navigant, 2013)*
- *Energy Savings Forecast of Solid-State Lighting in General Illumination Applications (Navigant, 2014)*
- U.S. Census (2010)

Vermont

- *Vermont Market Characterization and Assessment, Business Sector Existing Buildings (Navigant, 2011)*
- Efficiency Vermont Program Results (2000-2014)

Market Analysis

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Assumptions

Commercial **sector growth** of 1% annually

(Aligns with *Energy Savings Forecast of Solid-State Lighting in General Illumination Applications*)

Screw base lamp **in-service rate** of 85%

- 15% not installed due to failure, early replacement, installation outside of territory, or product stocking

Forecasted **market adoption rates** based on:

- Efficiency Vermont experience
- U.S. DOE price and efficacy projections

Vermont Lighting Market Analysis Goals

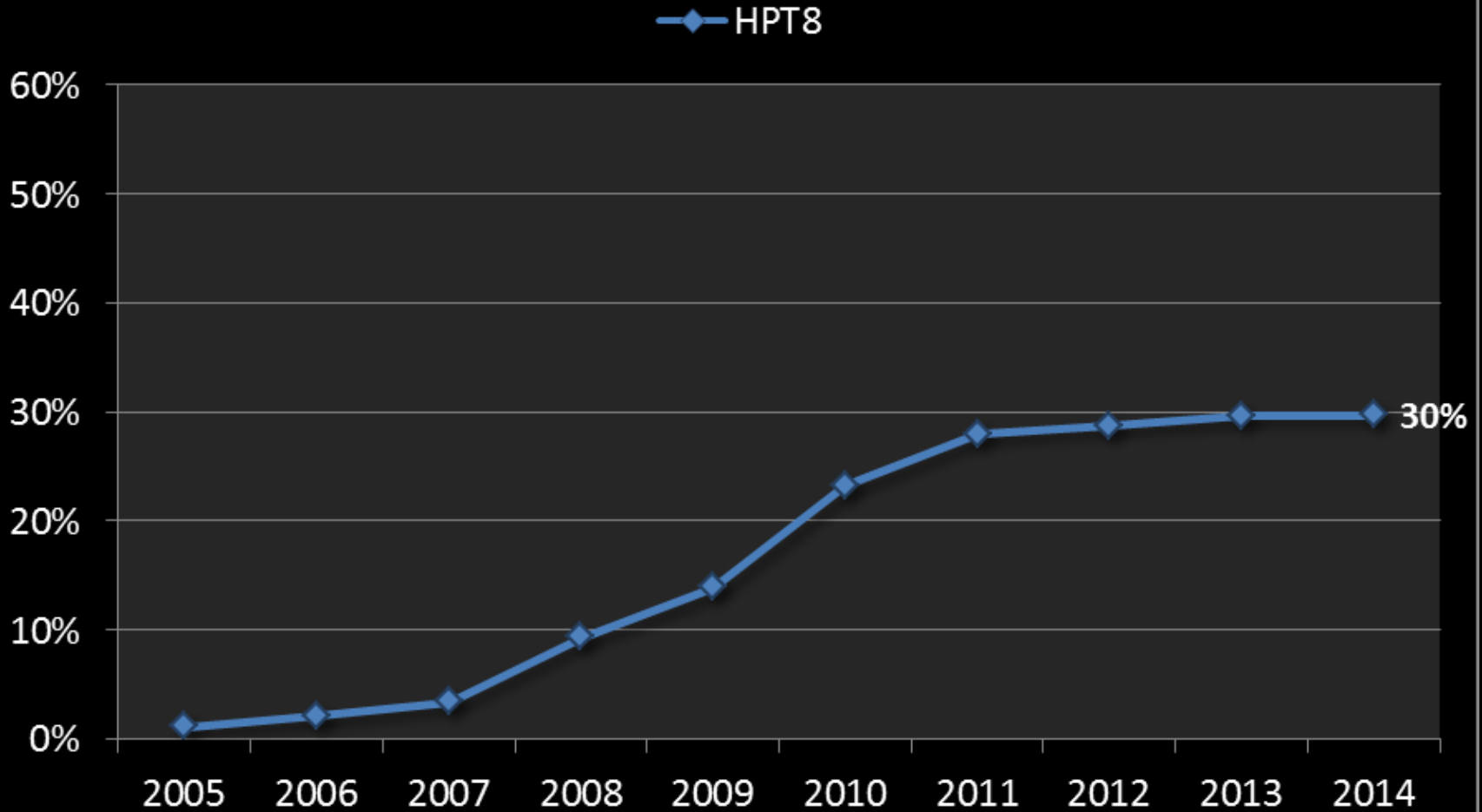
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Market Analysis

Future Potential

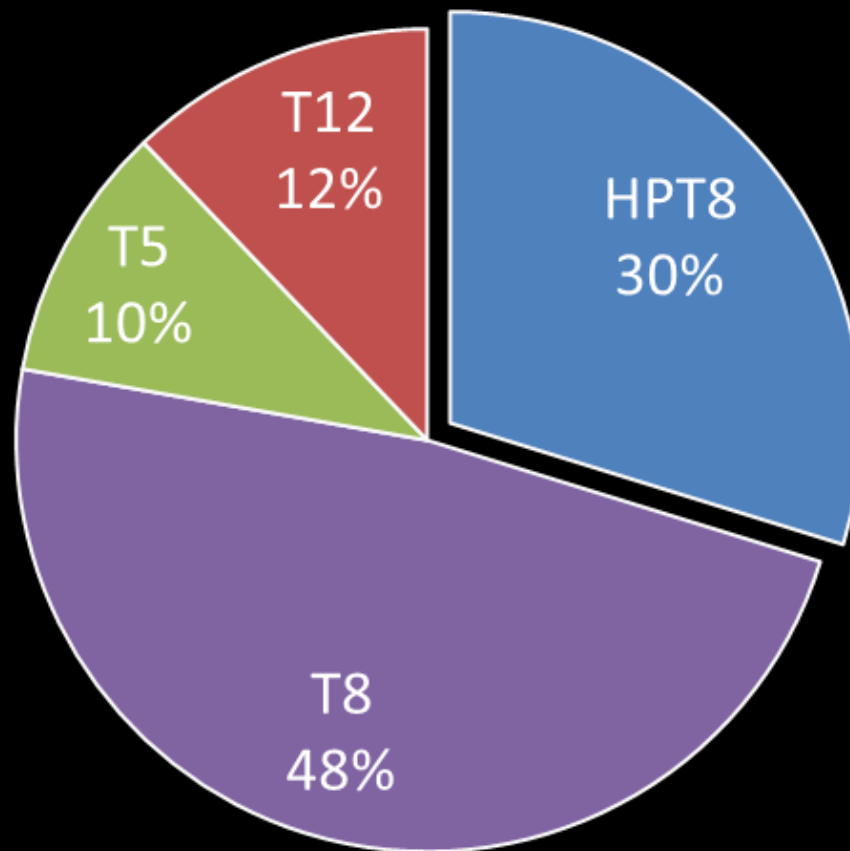
Strategies

Vermont C&I Lighting Market Penetration

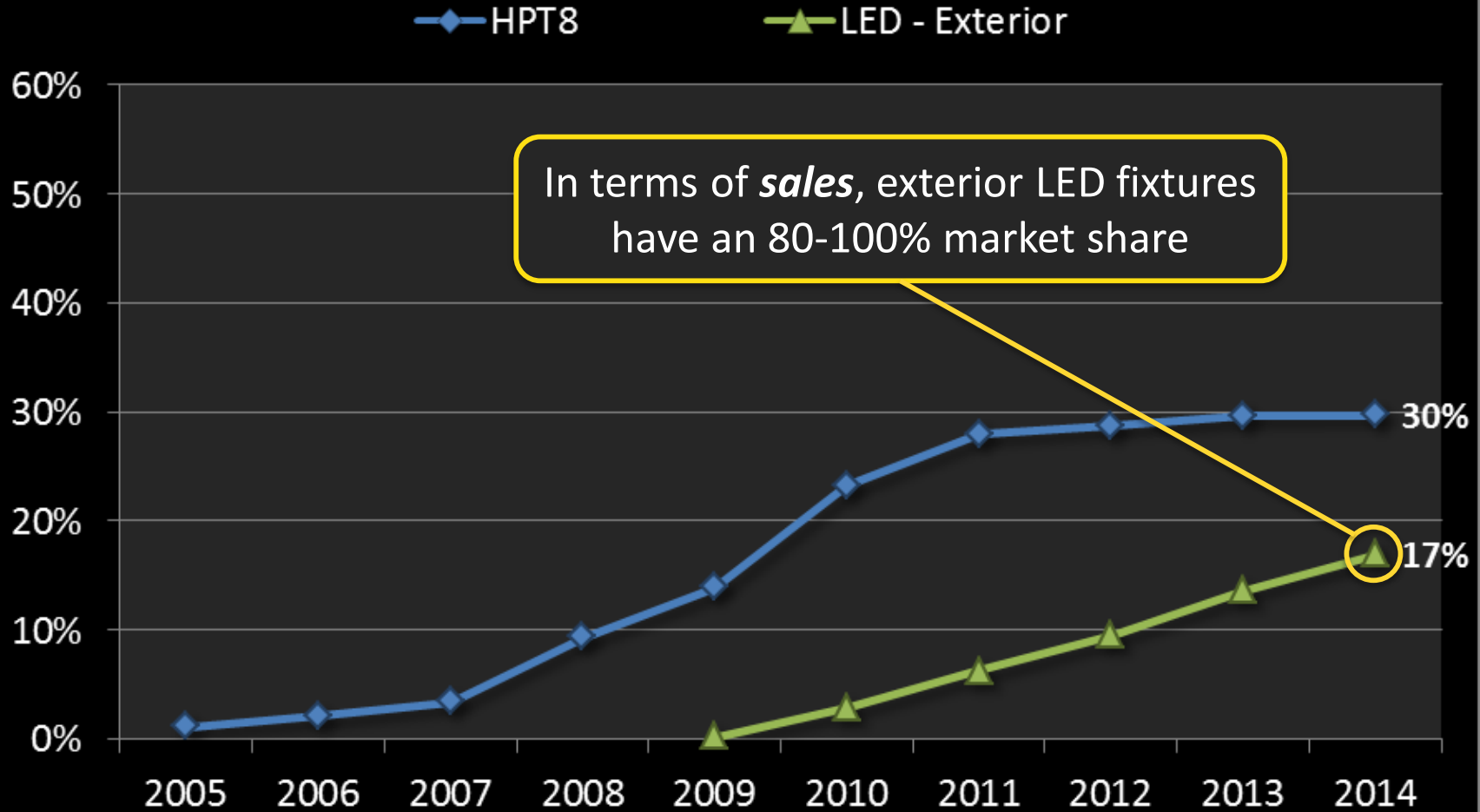


Vermont C&I Lighting Market (2014)

Distribution of Troffer/Linear Technologies

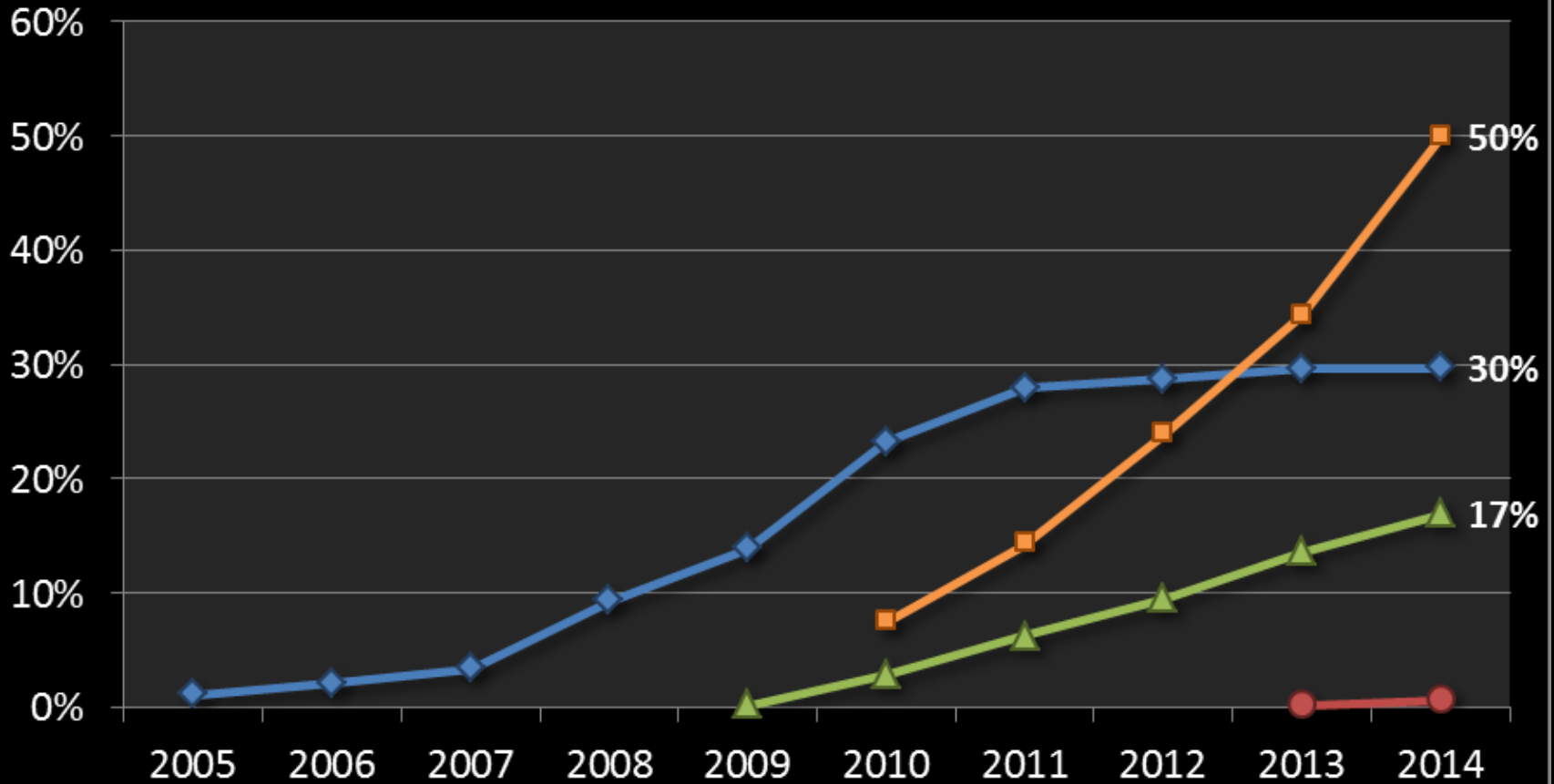


Vermont C&I Lighting Market Penetration



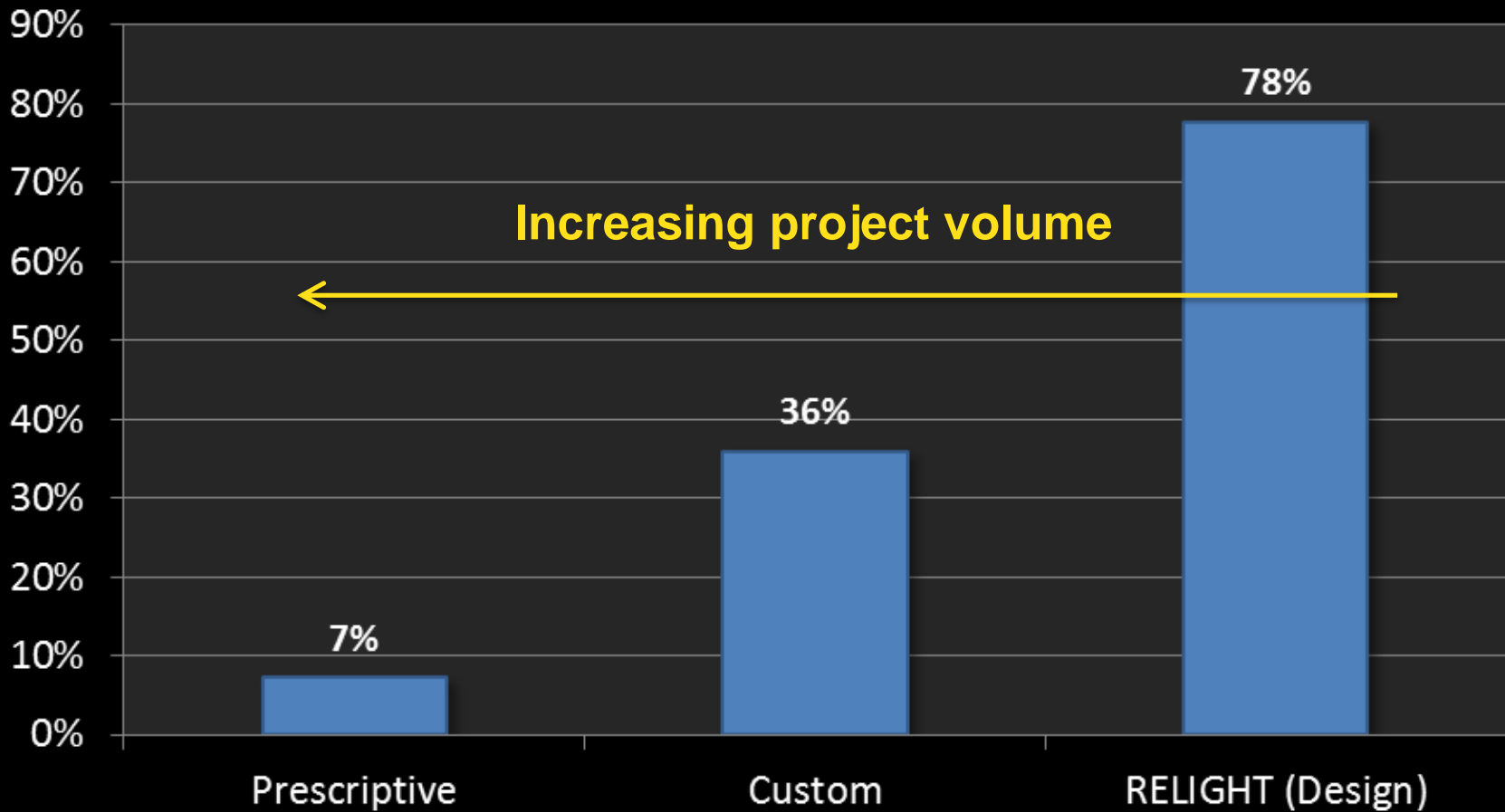
Vermont C&I Lighting Market Penetration

◆ HPT8 ▲ LED - Exterior ■ LED - Screw Base ● LED - Troffer/Linear



Efficiency Vermont Lighting Control Adoption

(% of Lighting Projects that Include Controls)



Key Takeaways

HPT8 & T5/HO are at or near saturation

Exterior LED adoption is steadily increasing

Screw base LED trend is impressive, but also unique

- Easy to install measure
- Pent up demand for an EE option superior to CFL
- High incentives applied at the point of sale

Lighting Controls have a poor adoption rate across prescriptive and custom programs

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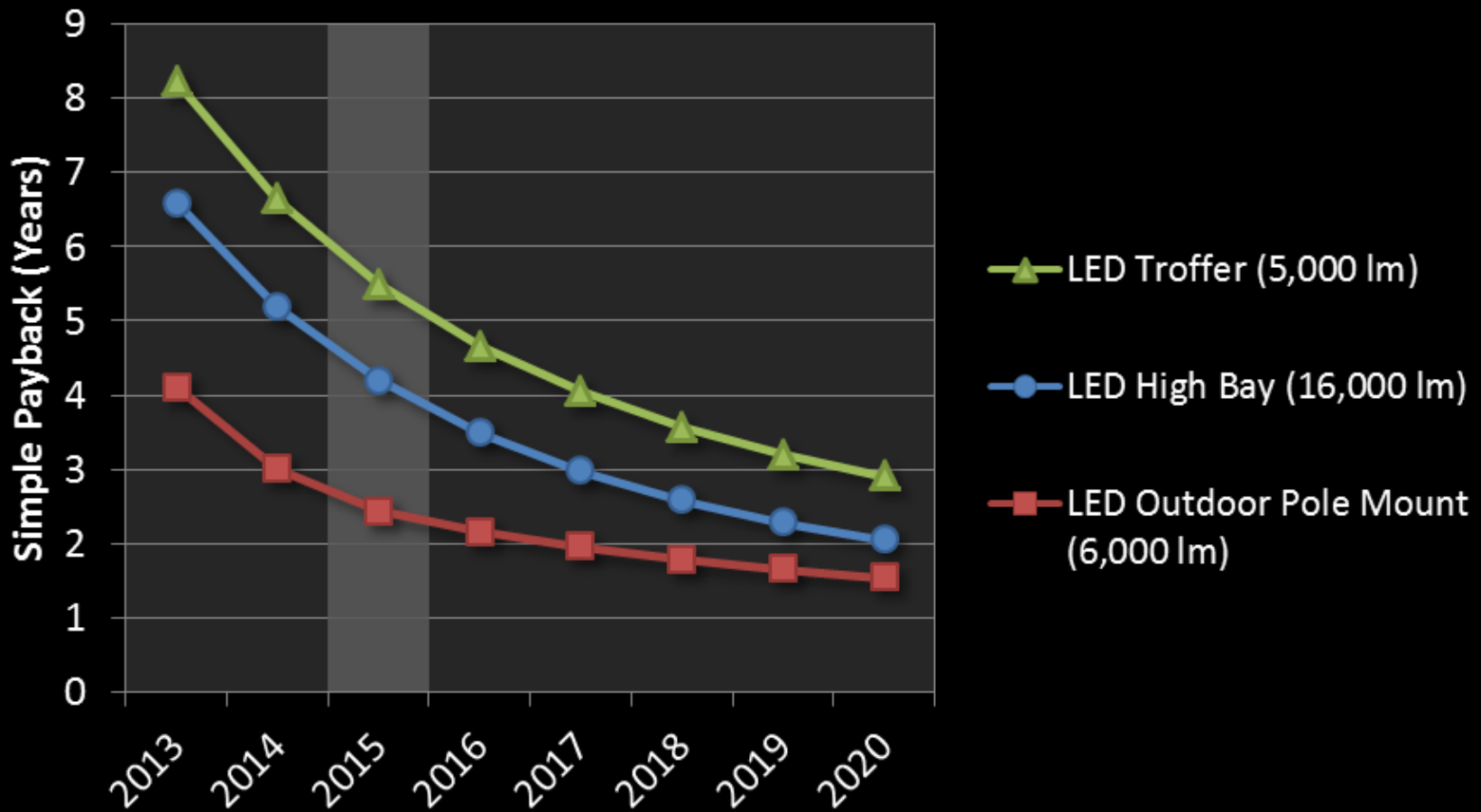
Market Analysis

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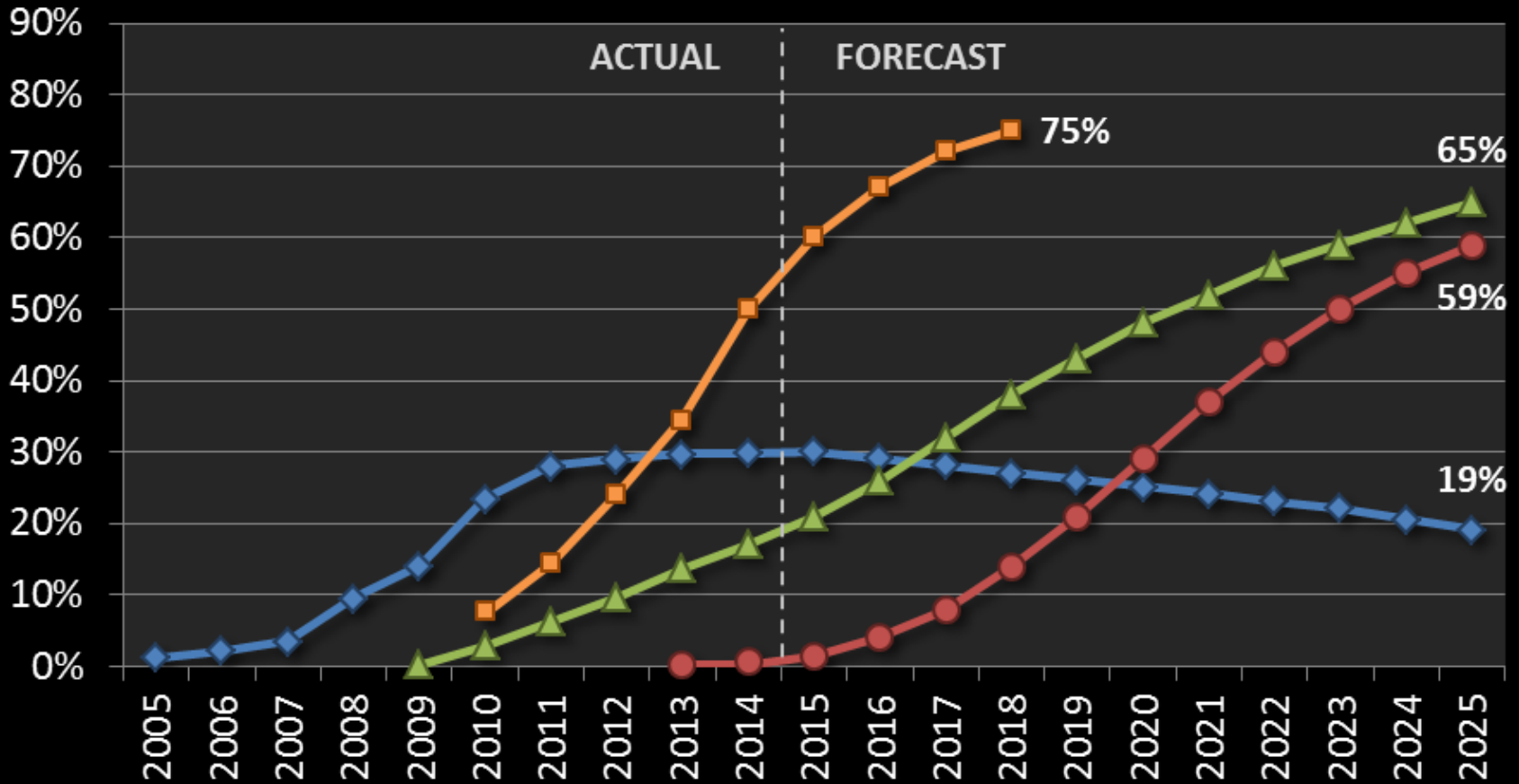
Vermont LED Retrofit Payback Forecast

Accounts for future cost, efficacy and incentive changes

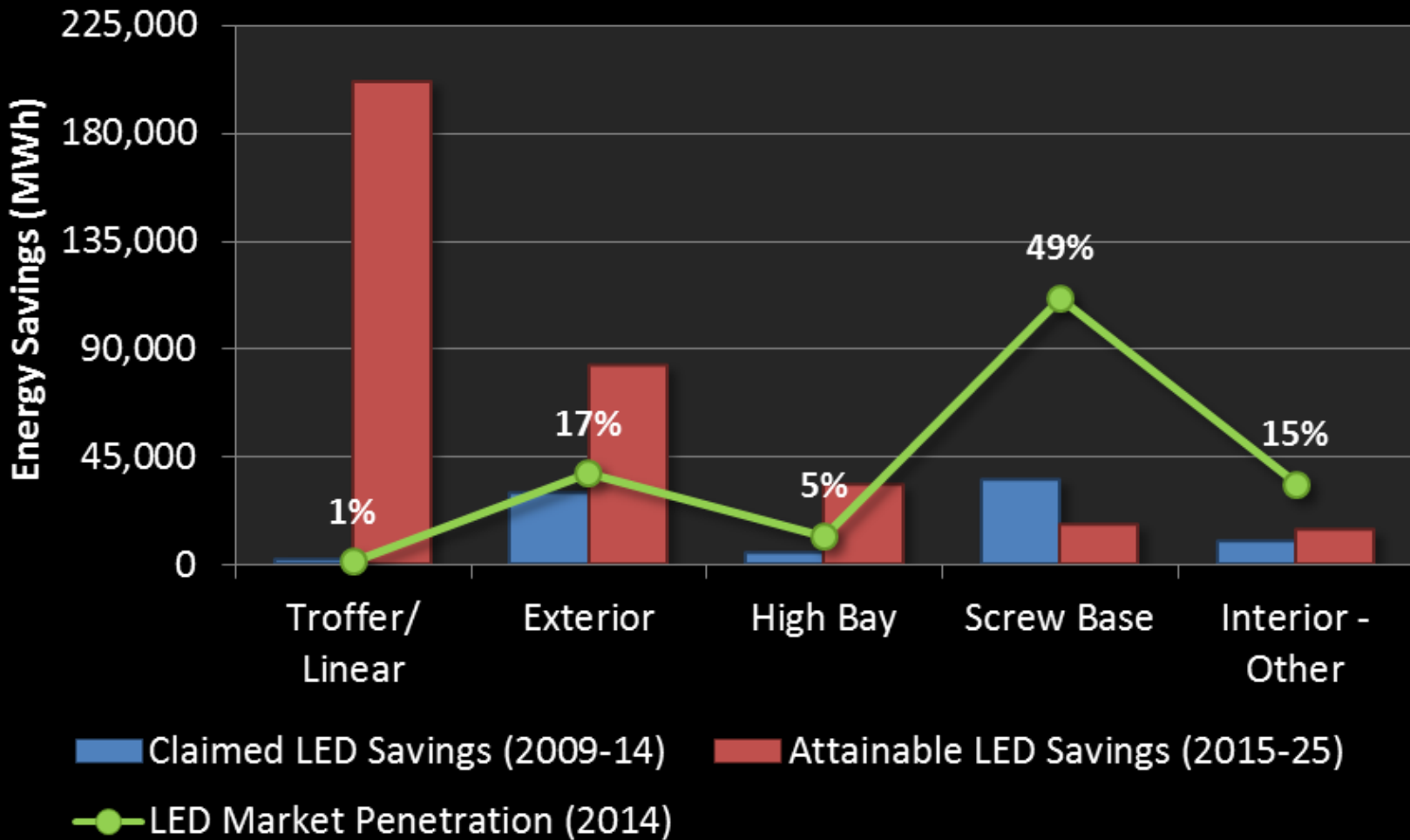


Vermont C&I Lighting Market Penetration

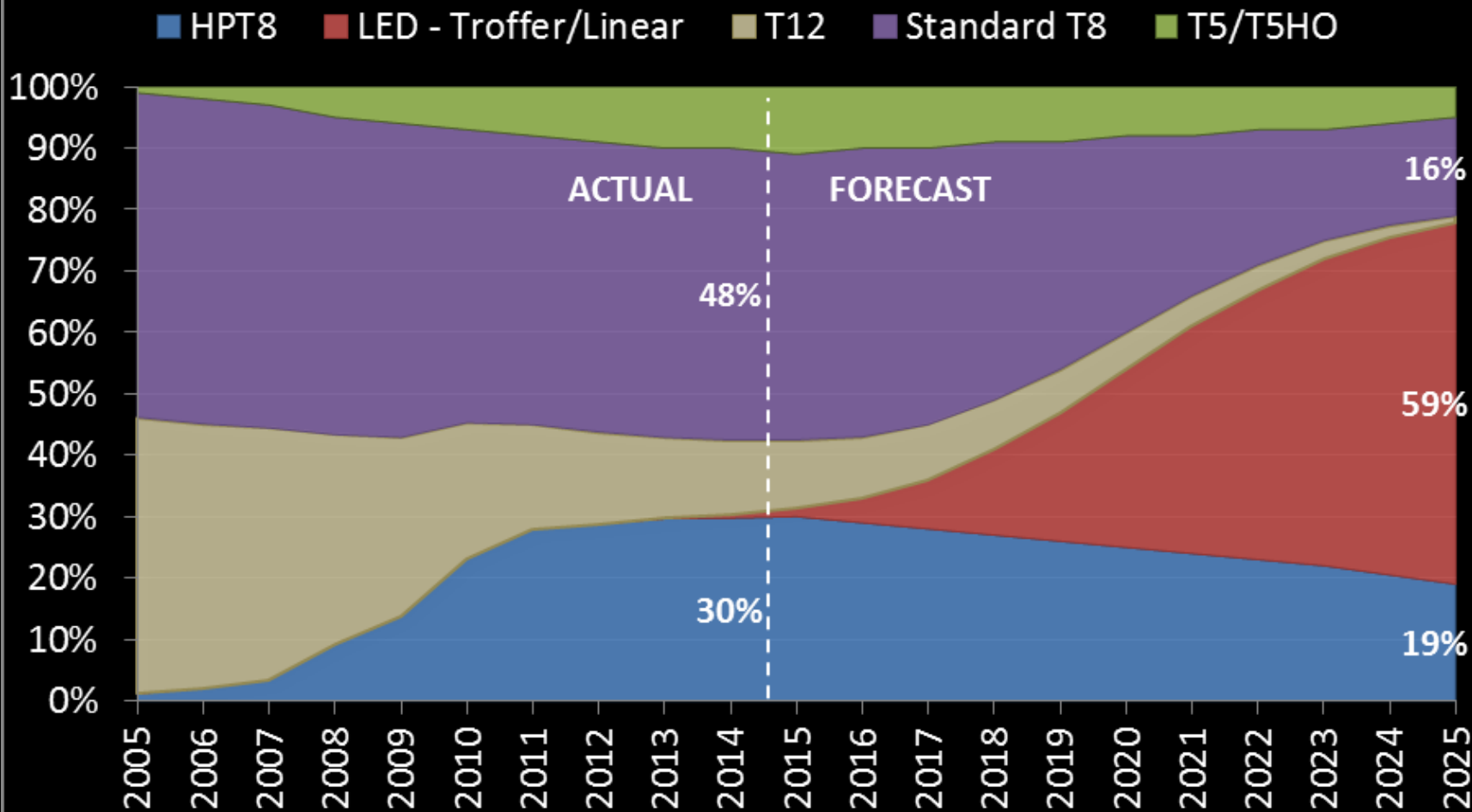
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Efficiency Vermont C&I LED Savings Analysis



Vermont Troffer/Linear Market Penetration

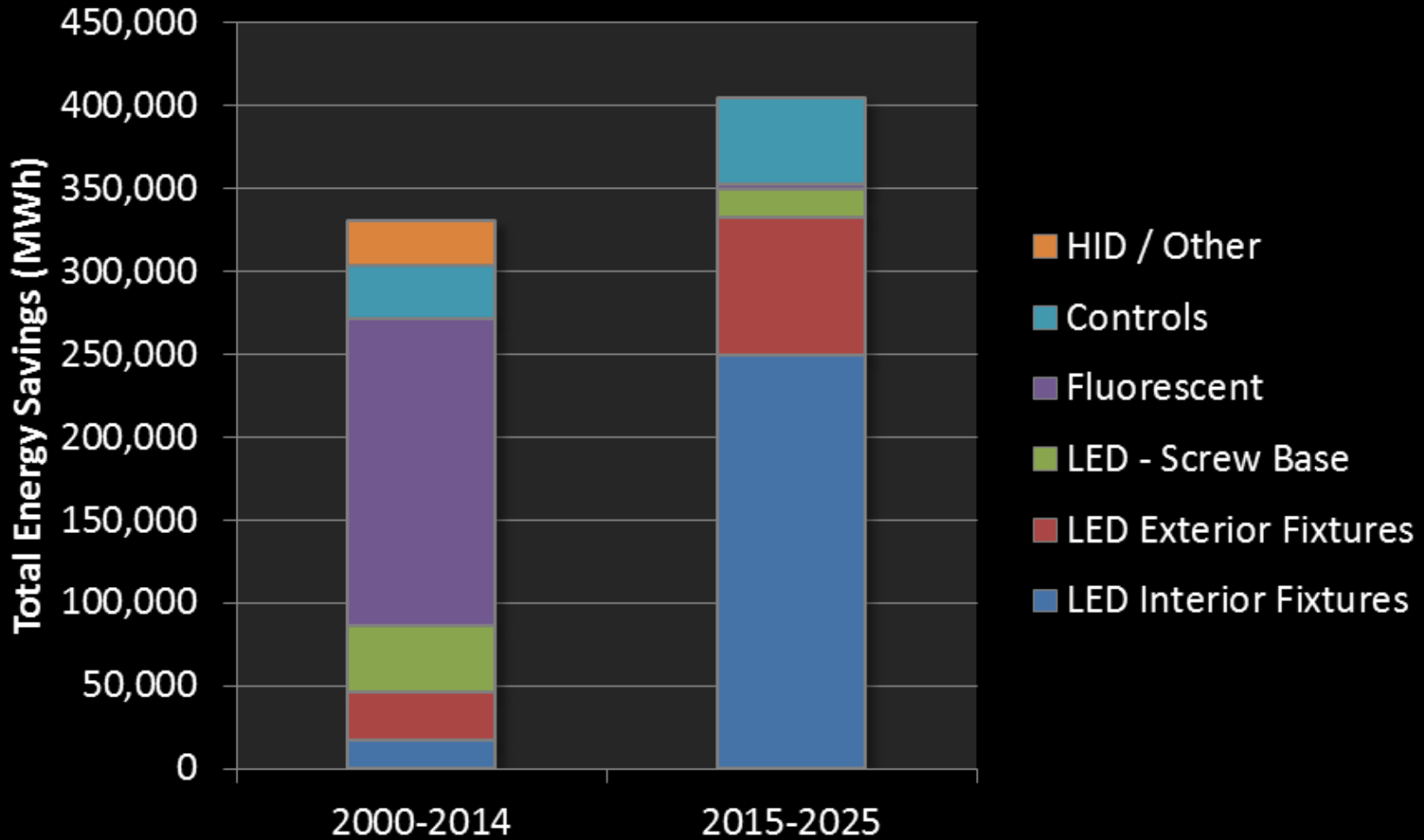


Market Analysis

Future Potential

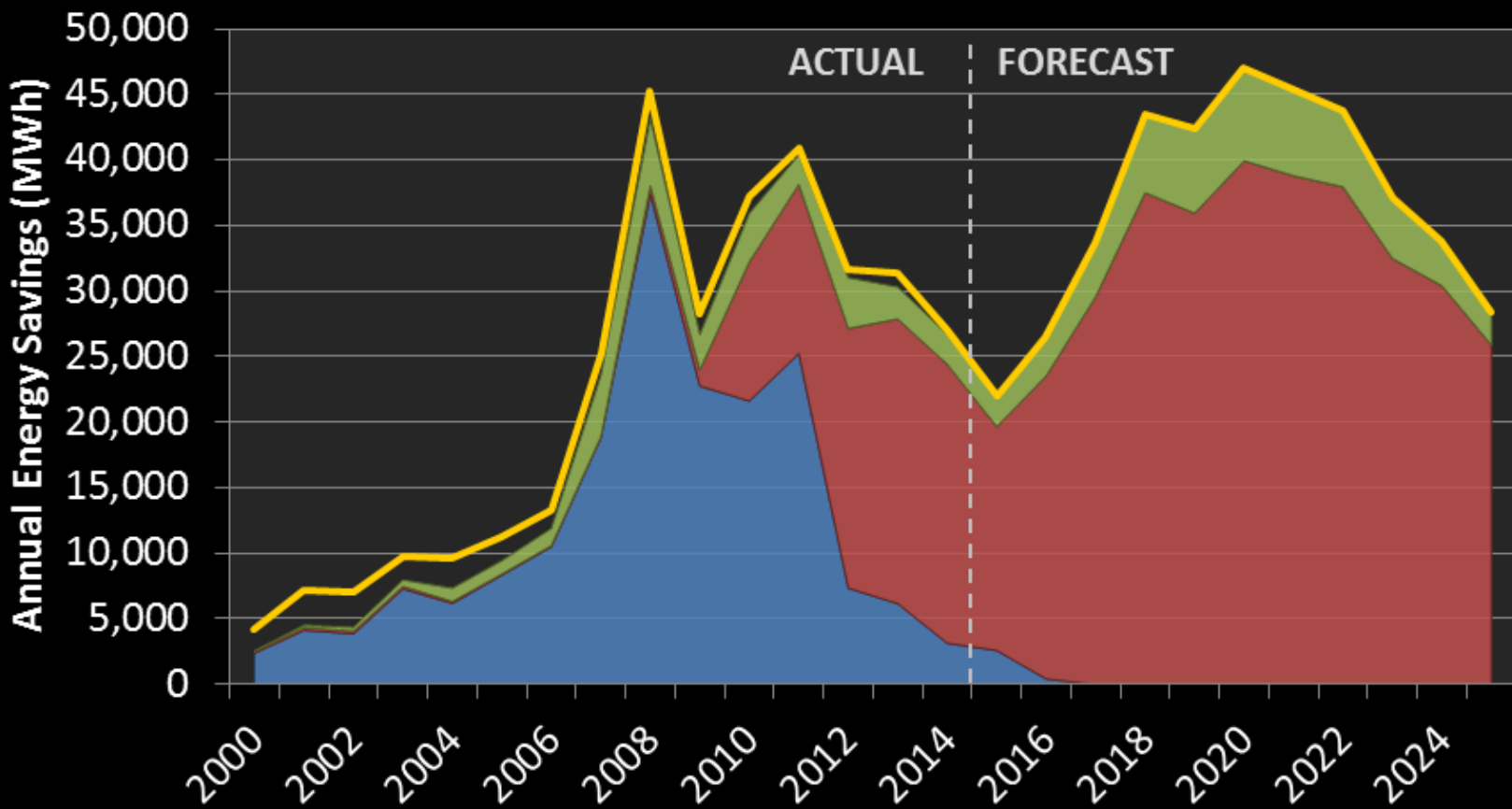
Strategies

Efficiency Vermont C&I Lighting Forecast



Efficiency Vermont C&I Lighting Savings

■ Fluorescent
 ■ LED
 ■ Controls
 — All C&I Lighting

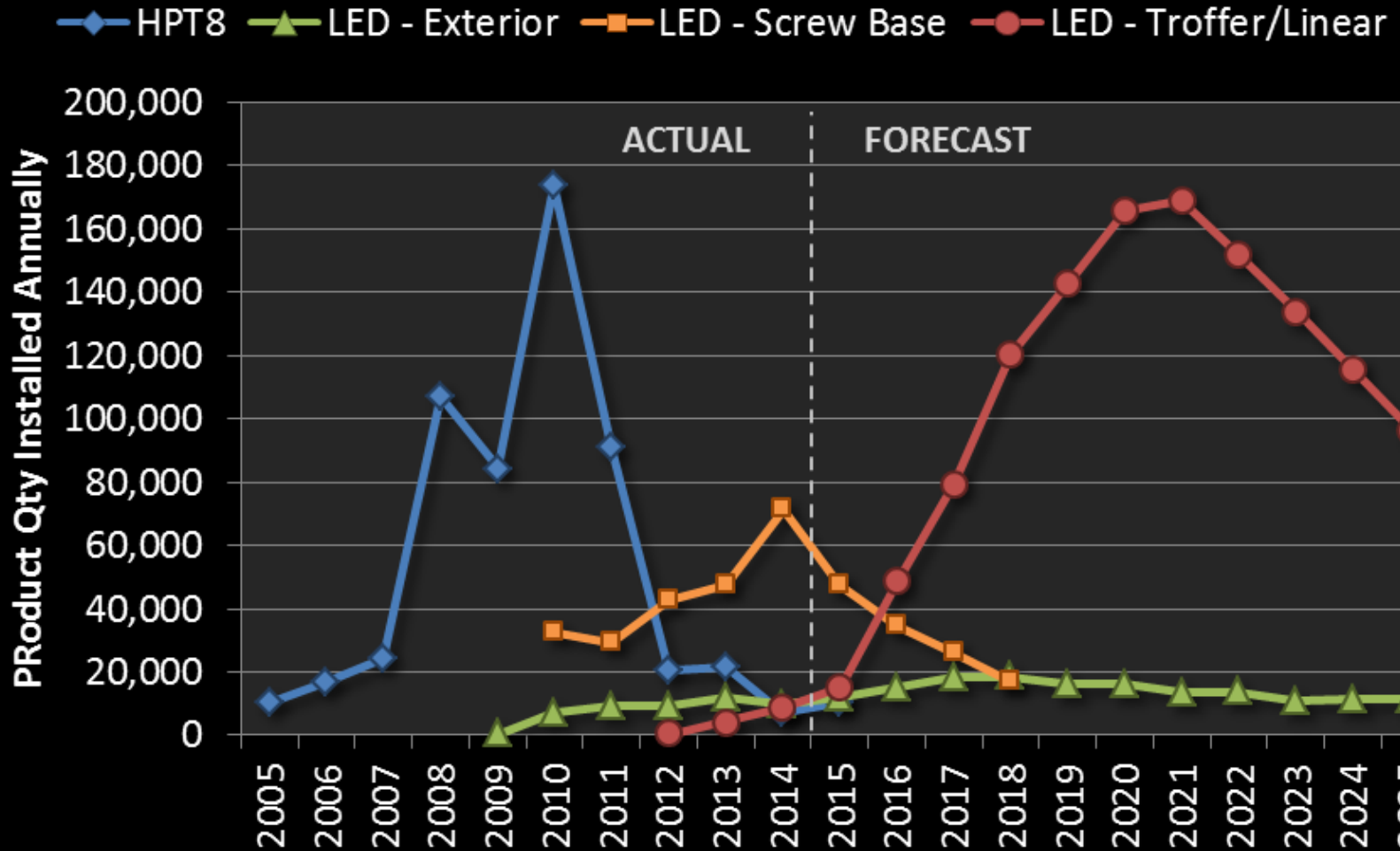


Market Analysis

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Strategies

Vermont C&I Lighting Product Adoption



Key Takeaways

- Market penetration for LED troffer/linear/highbay fixtures is low, but adoption is increasing rapidly
 - Opportunity to address product supply, controls integration and application best practices
- Exterior LED market is well established; need to maintain momentum and maximize opportunity
 - Exterior controls, application guidance
- Screw base LED will be a declining measure for C&I (not the case for residential)

Vermont Lighting Market Analysis Goals

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Accelerating LED Fixture Adoption

Partnerships

- Align sales & marketing with supply chain
- **Use co-op advertising with partners**

Rebates

- Offer rebates upstream (point-of-sale)
- **Package fixture & control incentives**
- Use distributor/contractor sales incentives

Education

- **Enhance product qualification (DLC, ES)**
- Develop application guidance
- Promote design-based projects

Product Availability

- Encourage local & regional stocking
- Utilize manufacturer co-promotions

Market Analysis

Future Potential

Strategies

Co-Op Advertising

GET YOUR
CO-OP
DOLLARS!

COMMERCIAL CO-OP ADVERTISING

Efficiency Vermont provides partners with co-op advertising funds to help promote the purchase and installation of new energy-efficient equipment, including:

- Compressed Air
- HVAC
- Lighting
- Refrigeration
- Snowmaking

Contractors, distributors, and suppliers who have completed a commercial or industrial project with Efficiency Vermont in the past two years will be reimbursed **up to 50%** of the cost of a pre-approved ad, **up to \$1,000**

www.encyvermont.com/coop

Efficiency Excellence Network

EFFICIENCY EXCELLENCE NETWORK



**EFFICIENCY
EXCELLENCE
NETWORK**
Efficiency Vermont

**GREATER EXPOSURE
INCREASED BUSINESS
MORE REFERRALS**

JOIN
— THE —
**Efficiency Excellence
Network**

Encouraging contractors and distributors to identify and promote energy efficiency equipment & opportunities in their work.

Market Analysis

Future Potential

Strategies

Enhance LED Product Qualification

(1) Simplify qualification and (2) promote high quality

Potential DesignLights Consortium (DLC)

“High Performance” product tier:

- Higher efficacy (~ 35%)
- Longer warranty (7 years vs. 5)
- Better lumen maintenance (90% @ 25K hours)
- Driver reliability testing

Streamlined product categories (DLC and EVT)

LED Troffer Application Guidance

Challenges

- Not nearly as simple as re-lamp & re-ballast
- Can be difficult to obtain desired light output
- **Controls must be incorporated now**
- Need clear & simple guidance

Potential Tools

- Department of Energy LED troffer fact sheet
- Lighting Research Center LED troffer application guidance
- EVT/BED fact sheet on integral lighting controls (pending)

DOE LED Troffer Fact Sheet

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

Building Technologies Office
SOLID-STATE LIGHTING TECHNOLOGY FACT SHEET

Upgrading Troffer Luminaires to LED

Lighting accounts for roughly 20% of the electricity use in a typical commercial building, and the workhorse in these indoor applications has been the linear fluorescent lamp. In 2010, lighting systems using linear fluorescent lamps accounted for over 75% of the lighting service in commercial buildings. Recessed troffer luminaires, commonly available in 1' x 4', 2' x 4', and 2' x 2' sizes, provide the majority of this lighting. The total installed stock of common linear fluorescent luminaires in the United States is estimated to be over 960 million luminaires.¹

Although the installation of LED troffer-style luminaires jumped from an estimated 40,000 units in 2010 to nearly 700,000 units in 2012, LED luminaires still represent less than 0.1% of the troffer luminaires installed in commercial buildings. It may be possible to achieve over 25% energy savings on a national level if LED technology reaches its projected market penetration in troffer luminaires of over 65% by 2030. The energy savings on an individual project



http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/led_troffer-upgrades_fs.pdf

LRC LED Troffer Application Guidance

LED TROFFER INSTALLATIONS

*A guide for contractors and specifiers
to replacing fluorescent troffers with
new LED troffers or retrofit kits.*

Summary

This document provides guidance on selecting suitable LED troffers or retrofit kits to replace existing fluorescent troffers. In retrofit applications, a one-for-one replacement at existing troffer locations is most cost effective.



<http://www.lrc.rpi.edu/programs/lightingtransformation/pdf/ledtrofferinstallations.pdf>

LED Troffer Product Availability

Need products available over-the-counter or with short lead time (2 business days)

- In most common lumen & CCT packages
- **With integral controls**

Need to strengthen the value proposition for distributors to stock/sell/promote:

- Sales incentives
- Higher margins
- Extended payment terms

Lighting Controls

Significant potential remains for controls if installed *at the time of LED upgrade*

- Will be difficult to justify economically at a later date



How do we:

- Maximize the use of controls (and energy savings)?
- Balance deep energy savings with affordability?
- Keep the solution simple for customers & partners?

Summary

Strong LED results to date are just the beginning

- **LED troffer/linear fixtures** represent an immense amount of energy savings potential within Vermont

Installed solutions **must incorporate controls**

Need creative approaches to address education, product availability, controls, and promotion

Thank you!

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Lighting Strategy Manager | Efficiency Vermont

