



Northeast Energy Efficiency Partnerships

Smart Lighting:

New Opportunities for Multiple Benefits

2016 Northeast Residential Lighting
Workshop

Tuesday, September 20th

2:50am-3:50pm

Background

- NEEP is looking at:

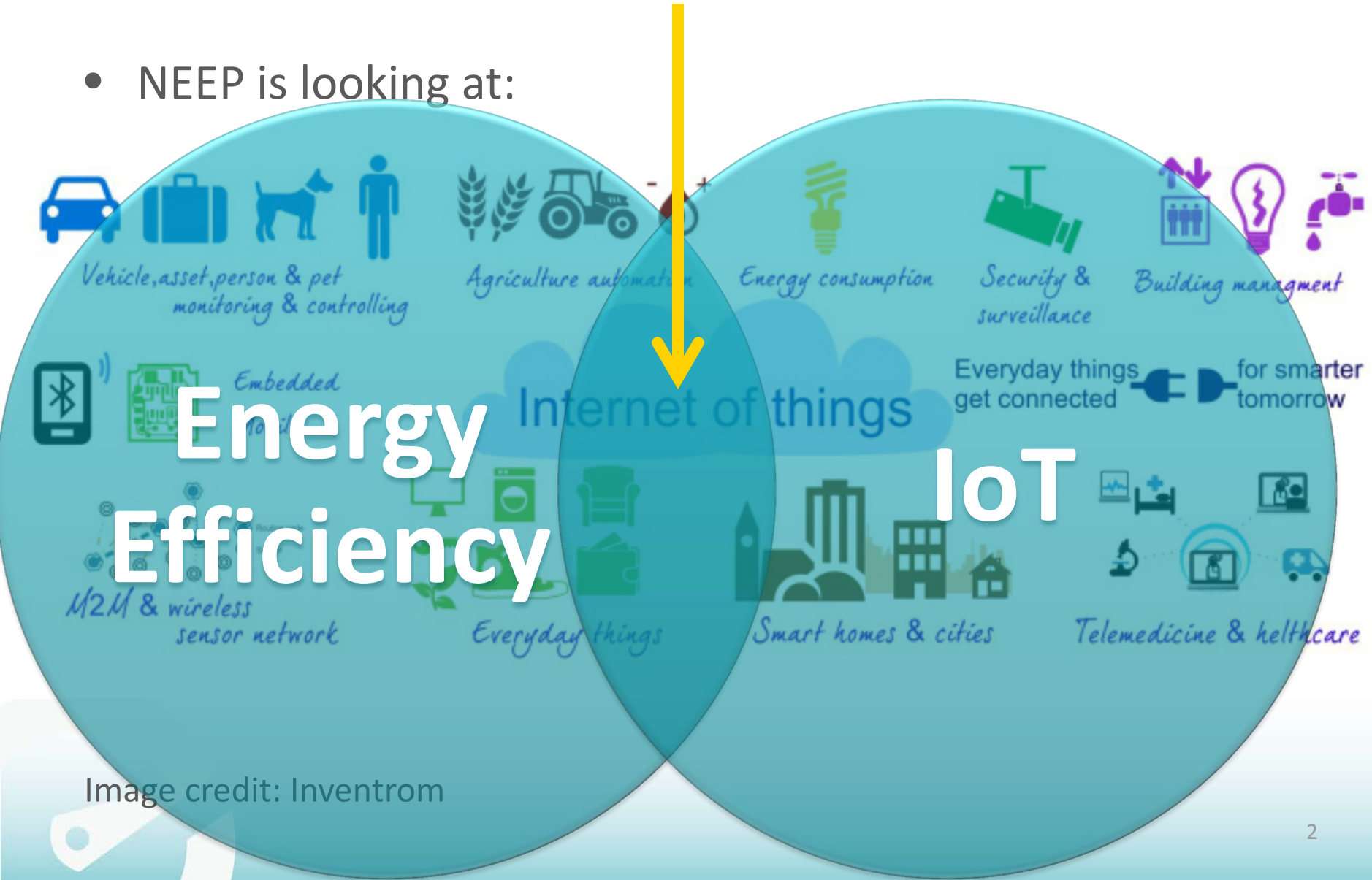


Image credit: Inventrom

“We have our best minds on this...”



“We have our best minds on this...”



Dumber

Energy Savings?
Demand Response?
Equity?
Cost effective?



- Basic control (hub & app)
- Color tuning (hub & app)
- Tuning for specific application
- Advanced functionality: app, no hub needed

Smarter



Lamp Intelligence Continuum

Standby Power

- Recent press



eceee european council for an energy efficient economy

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Stand-by of “smart lamps” can be larger than their energy use for lighting

(eceee news, 06 Sep 16) “Smart” lamps combine technology breakthroughs in wireless communications with light emitting diodes (LEDs) to provide many exciting consumer benefits. However, the standby energy use of “smart lamps” can be larger than the energy used for providing lighting, according to a new report from the IEA 4E Solid State Lighting Annex issued today.

Smart lamps are an exciting new family of products which provide an opportunity for the consumer to benefit from smart services, better product quality and energy savings. Combining wireless communication, intelligent controls and light emitting diodes (LEDs), these lamps offer end-users features like colour tuning, dimming, changing lighting scenes, remote control, motion sensing control, daylight control and other features. But these features require energy even when the lamps are not providing light, but are instead waiting for a wireless instruction from a smartphone or remote control unit.

Policy makers concerned over lost savings

“Policy-makers who are looking at lighting products are concerned that

Standby Power

- Unchecked limits are a real concern
- ENERGY STAR sets .5W

Starting Lamp wattage	Standby power (in both on and off modes)	Annual kWh (at 3 hours of use/day + 21 hours/day in just standby mode)	% increase from no standby mode
8.5	0W (not connected)	9.3	
8.5	.2W	$9.53 + 1.53 = 11.06$	19%
8.5	.5W	$9.86 + 3.83 = 13.69$	47%
8.5	1W	$10.40 + 7.66 = 18.06$	94%
8.5	2W	$11.50 + 15.32 = 26.82$	188%

Brand	Product	Wattage equivalent	Color Tuning?	Standby Power	Efficacy	Cost
LIFX	White 800	60	White light color tunable	~.5-.7W	81lpw	\$39.99
	Color 1000	75	RGB Color tunable	~.5-.7W	96lpw	\$59.99
GE	C-Life	60	No, 2700K	~1W	73lpw	\$70 for 4 bulb starter pack (2 C-Life, 2 C-Sleep)
	C-Sleep	60	3 settings: AM at 7000K, Daytime at 3000K, and PM at 2000K	~1W	77lpw	
Ilumi	Ilumi	60	RGB Color tunable	<1W	~80lpw	\$99.99 for 2 pack

Tips for Successful Smart Lighting

- Delighted customer
- Energy benefits outweigh costs
 - DR
 - DER
 - EE
 - Etc?
- And more...

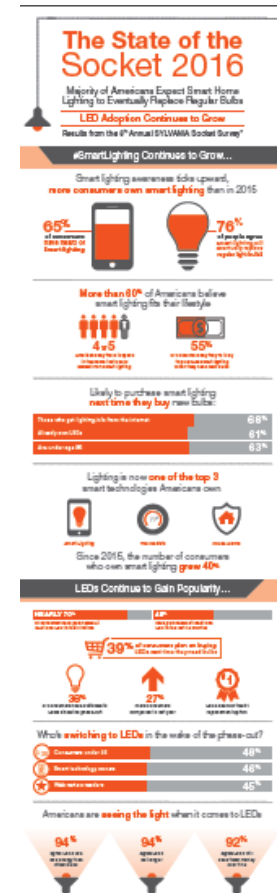
Speakers

- Chris Lubeck, LEDvance
- ***Rene Burger, Philips***
- Lisa McLeer, GE
- Jasmine Rivest, Efficiency Vermont

SYLVANIA Socket Survey 8.0 – Focus on Smart Lighting

Research on lighting topics including bulb use, LED knowledge,
and smart lighting

Christopher Lubeck
Head – Utility Relations
LEDVANCE/SYLVANIA



Survey 8.0 Research Objectives

We commissioned this survey to uncover insights on the topic of LED and smart lighting – specifically consumer adoption, and behaviors and attitudes towards the technology. This research was designed to:

1. Explore the prevalence of LED lighting in homes;
2. Understand the home lighting purchase behaviors of consumers, including pain points, influencers, and future purchases; and
3. Gauge consumer awareness and interest levels of new "smart lighting" and other technologies.
4. Track changes in findings year over year to highlight trends.

<https://www.sylvania.com/en-us/tools-and-resources/surveys/Pages/socket-survey.aspx>

Survey 8.0 - Background and Methodology

The Osram Sylvania Socket Survey has been conducted regularly since 2008. This document contains results from the 8th round of research. A new methodology and new questions were used in 2015-16 to explore the post-incandescent landscape. While comparisons to years prior to 2015 may be made in this report, those findings should be considered directional.

	2016	2015	2013	2012	2011	2010	2009	2008
METHOD:	Online survey		Landline and cell phone telephone survey				Landline telephone survey	
DATA COLLECTION:	February 24-March 1, 2016	February 19-24, 2015	November 15-24, 2013	November 8-15, 2012	October 13-17, 2011	November 20-December 1, 2010	November 6-10, 2009	November 14-17, 2008
SAMPLE SIZE:	1,000 interviews	1,000 interviews	300 interviews (65 via cell)	305 interviews (65 via cell)	303 interviews (76 via cell)	309 interviews (77 via cell)	302 interviews	301 interviews
SAMPLE: (American adults, ages 18+)	Obtained via online panel		Obtained through random digit dialing					
MARGIN OF ERROR: (At 95% Confidence)	±3.1% for the entire sample	±3.1% for the entire sample	±5.7% for the entire sample	±5.6% for the entire sample	±5.6% for the entire sample	±5.6% for the entire sample	±5.7% for the entire sample	±5.7% for the entire sample

Note: throughout this report, the term “significance” refers to statistical validity and does not indicate importance or meaningfulness.

Survey 8.0 Research Objectives – Smart Lighting

Lighting is now **one of the top 3** smart technologies Americans own



Smart Lighting



Thermostats

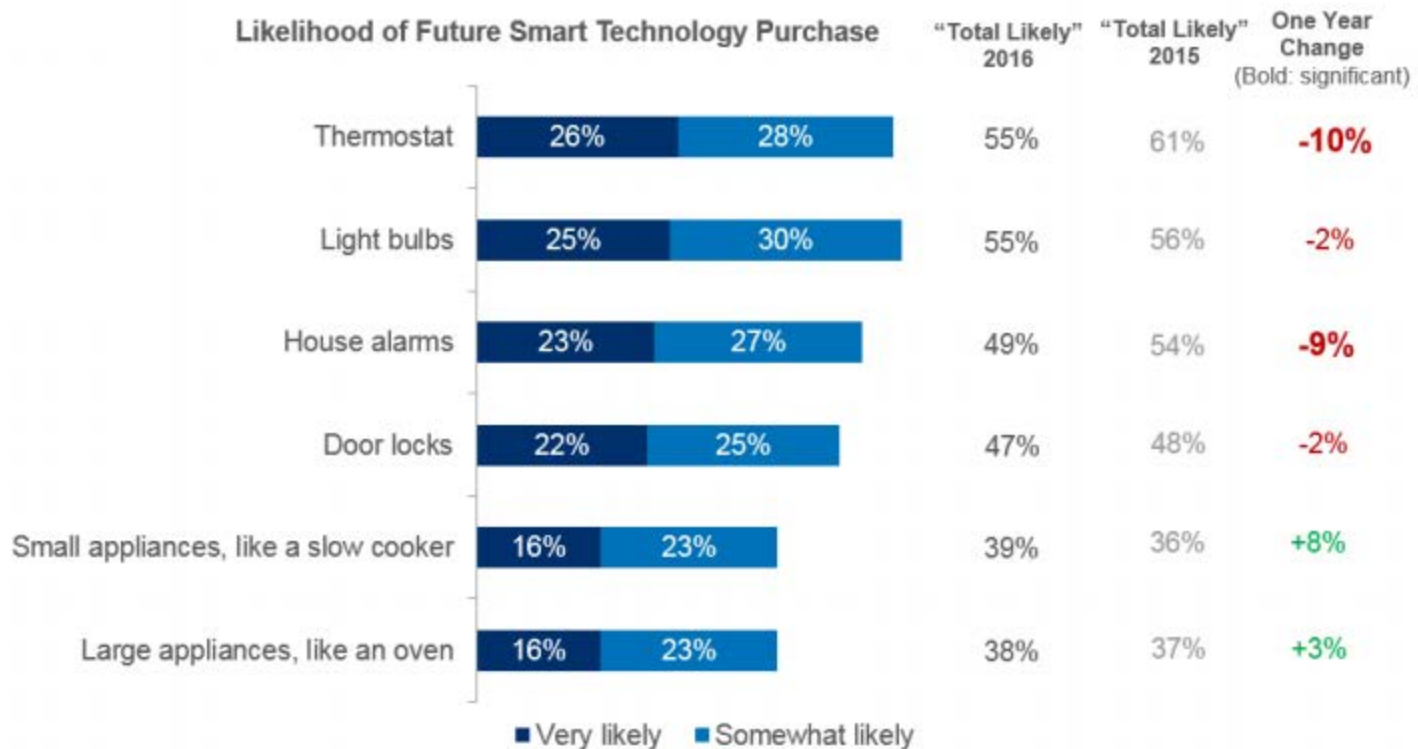


House Alarms

Since 2015, the number of consumers who own smart lighting **grew 40%**

Survey 8.0 Research Results – Smart Lighting

Approximately one quarter of Americans say it's *very likely* they will buy smart thermostats, light bulbs, house alarms, or door locks the next time they need them. (The likelihood of buying smart appliances is somewhat lower.)



Q17. When you next need to replace them, how likely or unlikely are you to buy smart versions of each of the following technologies? (n=1000)

Survey 8.0 Research Results – Smart Lighting

More than 60% of Americans believe smart lighting fits their lifestyle



4 out of 5

Americans say there is space in the home that could benefit from smart lighting



55%

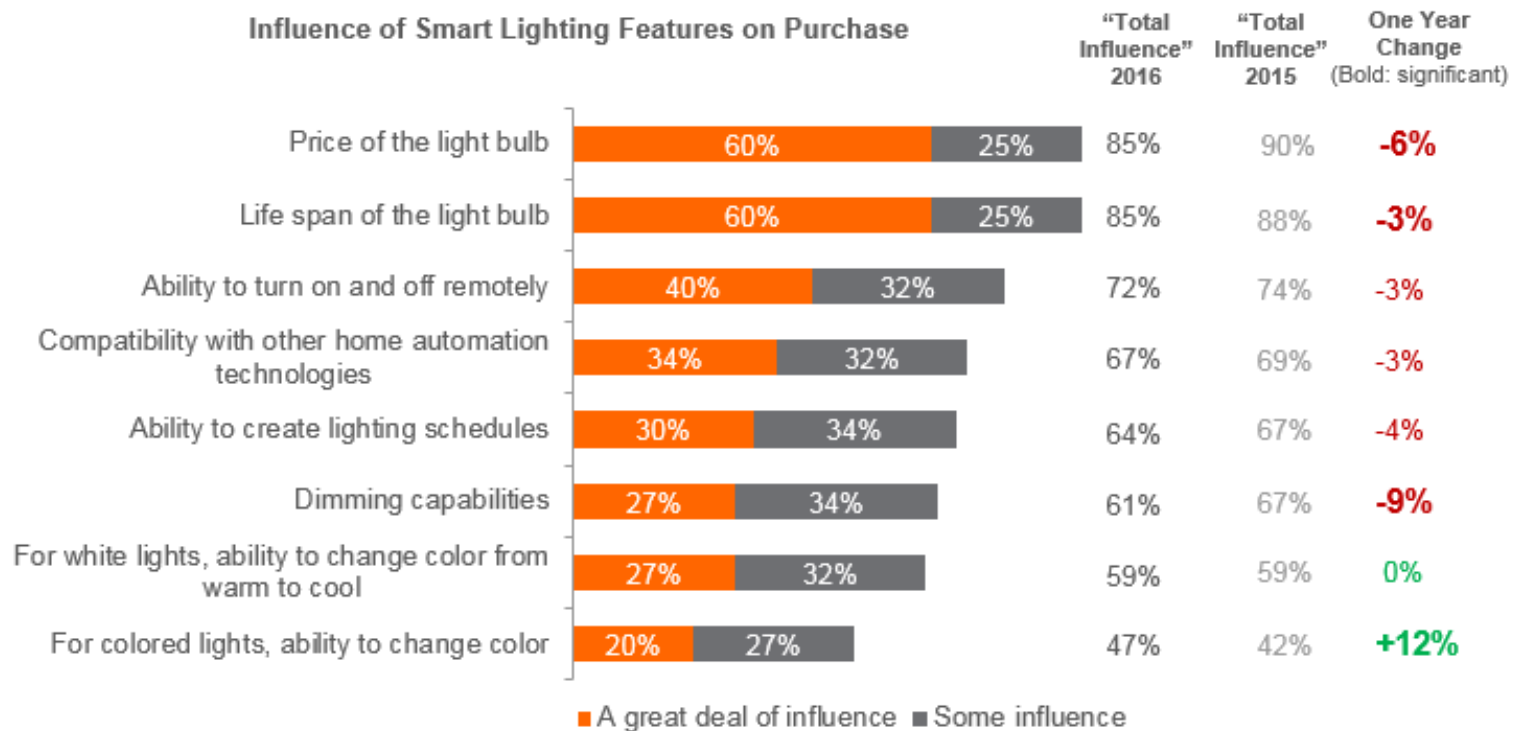
of consumers say they're likely to purchase smart lighting when they need new bulbs

Likely to purchase smart lighting
next time they buy new bulbs:



Survey 8.0 Research Results – Smart Lighting

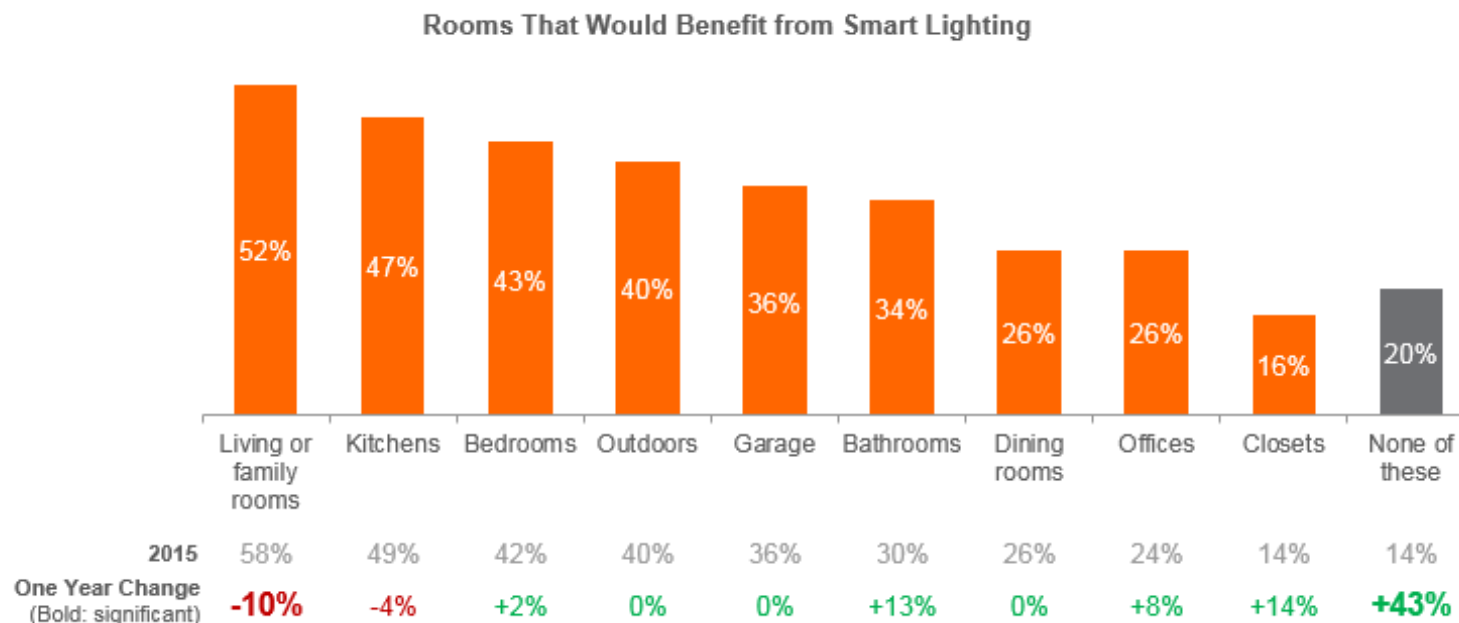
While longevity and brightness were most important for LEDs and all bulbs in general, price jumps to the top of the list of influences for smart bulb purchases.



Q19. When thinking about smart light bulbs, how much influence would the following features have in your decision to buy one? (n=1000)

Survey 8.0 Research Results – Smart Lighting

Four in five Americans believe at **least one room in the home would benefit from smart lighting technology**. Living rooms and kitchens are most commonly seen as benefiting from such lighting. Eighty-six percent of those under age 35 say any room would benefit, compared to 72% of those age 55 or older.



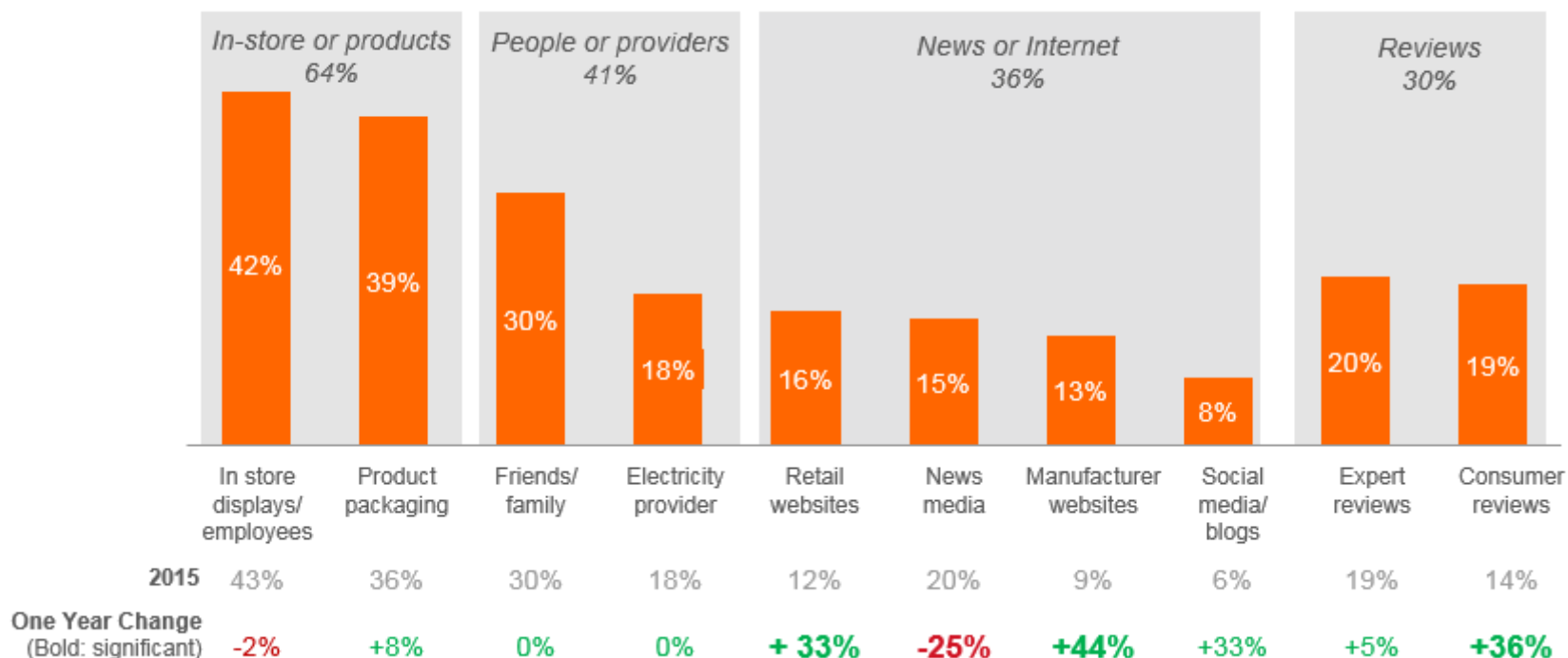
Q18. Which of the following rooms, if any, do you think would benefit from utilizing “smart” lighting solutions? (n=1000)

Survey 8.0 Research Results

Americans rely most on in-store displays and packaging when considering light bulbs.

Compared to 2015. Consumers are more often learning via websites and consumer reviews, and less often via traditional news media.

Information Sources for Light Bulb Purchases



Italics: statistically significant change from 2015 to 2016

Q13. Where do you get your information about what light bulbs to purchase? (n=1000)

Snapshot of Key Findings

Smart Technology

- Most consumers have heard of smart technology, especially thermostats, alarms, lighting, and locks. A smaller but growing number are familiar with smart appliances.
- Despite awareness, purchases are less common: less than one third of consumers have purchased smart technology of any kind.
- Still, consumers see advantages of smart technology for many spaces in the home, and only a small minority say homes would not benefit at all.

Smart Lighting

- Most consumers think smart lighting will eventually replace regular light bulbs, and the intensity of that belief (“strongly agree”) has grown noticeably since last year.
- More than half of consumers also believe smart lighting fits their lifestyle, and similar growth in the intensity of belief is evident.
- However, few consumers have ever purchased smart lighting, suggesting that Americans see a trend coming but have not personally adopted it.
- Price and lifespan are the two top influences on smart lighting purchase decisions. In the case of bulbs in general, price was the third-strongest influence, suggesting that cost is a stronger concern for smart lighting in particular.

Questions?

[https://www.sylvania.com/en-us/tools-and-resources/surveys/
Pages/socket-survey.aspx](https://www.sylvania.com/en-us/tools-and-resources/surveys/Pages/socket-survey.aspx)



Rene Burger

Senior Marketing Manager
Rene.burger@philips.com

Philips Hue is now ENERGY STAR Qualified!

Meet Philips Hue White products:

Philips Hue White Starter A19 Kit



\$79.99

Includes 2 soft white A19 LED bulbs
and 1 Hue Bridge

Philips Hue Wireless Dimming Kit



\$39.99

Includes 1 soft white A19 LED bulb and
a dimmer switch

Philips Hue White A19 LED bulb



\$14.99

Includes 1 soft white A19 LED bulb

Rebates range from \$3-\$7 per light bulb

Look for announcements in October 2016...

MEET **hue** NOW
Products

Hue White

Automate your lights

What's in the box:



Comfort dimming - control via app with a full range of white light

Light Schedules - make it seem like you're home when you're not

Away-from-home control - control lights wherever you are

455287 Starter Kit (2):	\$69.99
455295 A19 Bulb:	\$14.99



Hue Wireless Dimming Kit

What's in
the box:



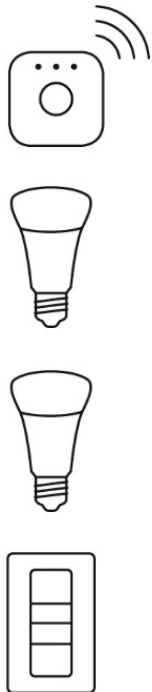
Installation free dimming - no re-wiring
Place switch **anywhere**
Upgradable to hue ecosystem with bridge

455386 Dimming Kit:	\$34.99
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Hue White Ambiance

Light for your Moments

What's in the box:



Feel good waking up and sleep soundly at night everyday

Turn each routine at home into perfect moments of yours

Be **creative** with your home and enjoy **decorating it with different styles**

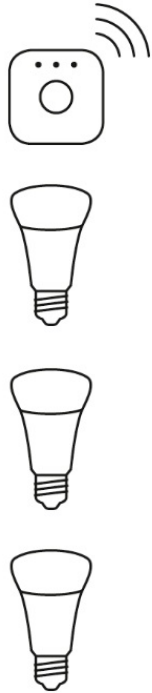
460989 Starter Kit (2):	\$129.99
461004 A19 Bulb:	\$29.99
464438 BR30 Bulb:	\$29.99



Hue White and Color Ambiance

Limitless Possibilities

What's in
the box:



Turn on your imagination - sync with music, movies,
and games

Paint with light – choose from 16 million colors to
match your mood

456194 Starter Kit (3):	\$199.99
456202 A19 Bulb:	\$59.99



Hue Lightstrip Plus

Ultimate Flexibility



Ultimate flexibility - shape, bend and extend
Paint with light- 16 million colors with all shades of white
Extendible up to 10 meters – 2 meter base with 1 meter extensions

800276	2M Base:	\$89.99
800268	1M Extension:	\$29.99



Hue Go

Take your light anywhere



Portable wireless light - most versatile light in your home

Paint with light- 16 million colors with all shades of white

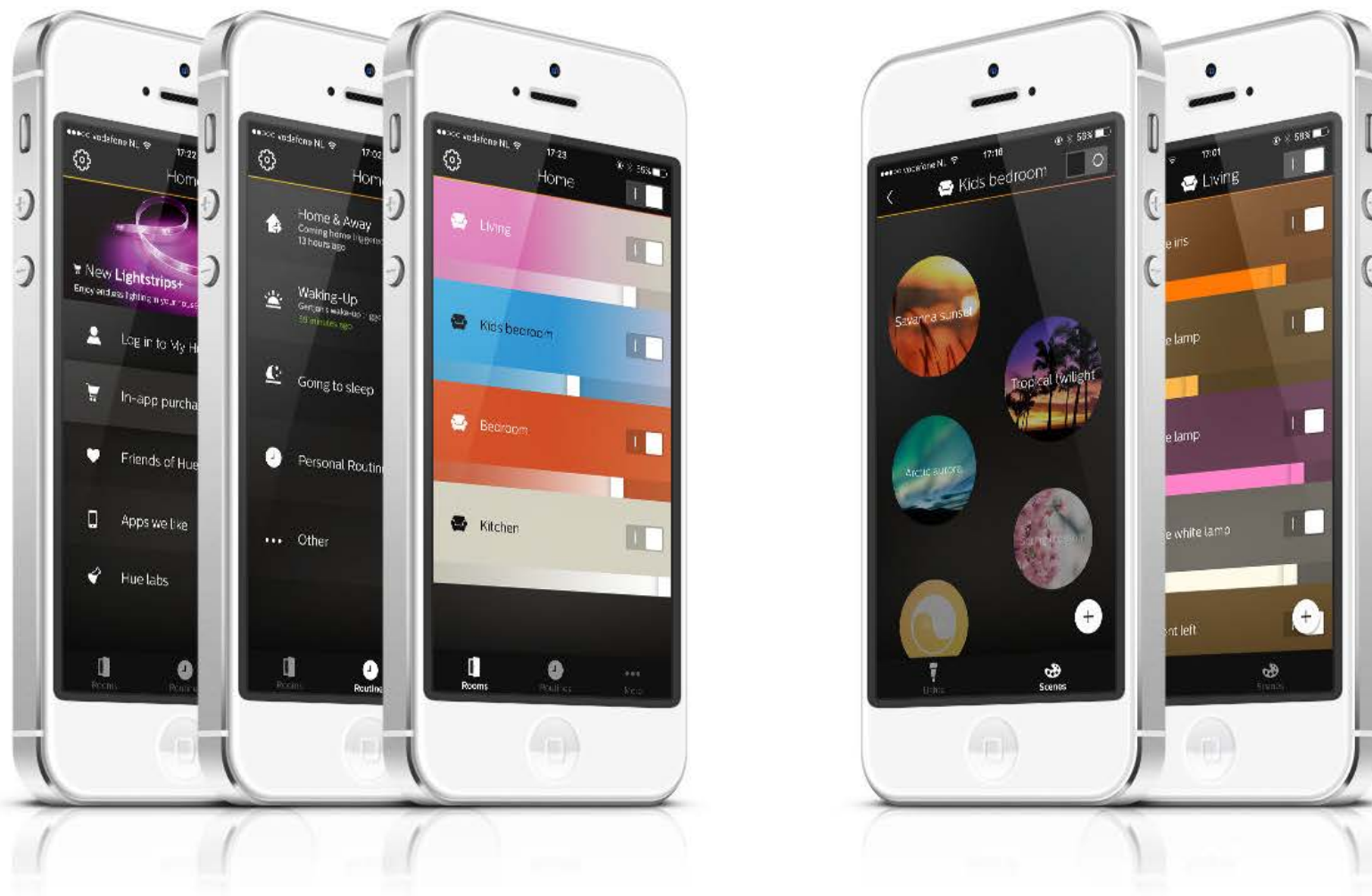
Control your way – activate light settings directly by pressing the smart control on the product or hook up to bridge for full Hue Control

798835 Hue Go:	\$79.99
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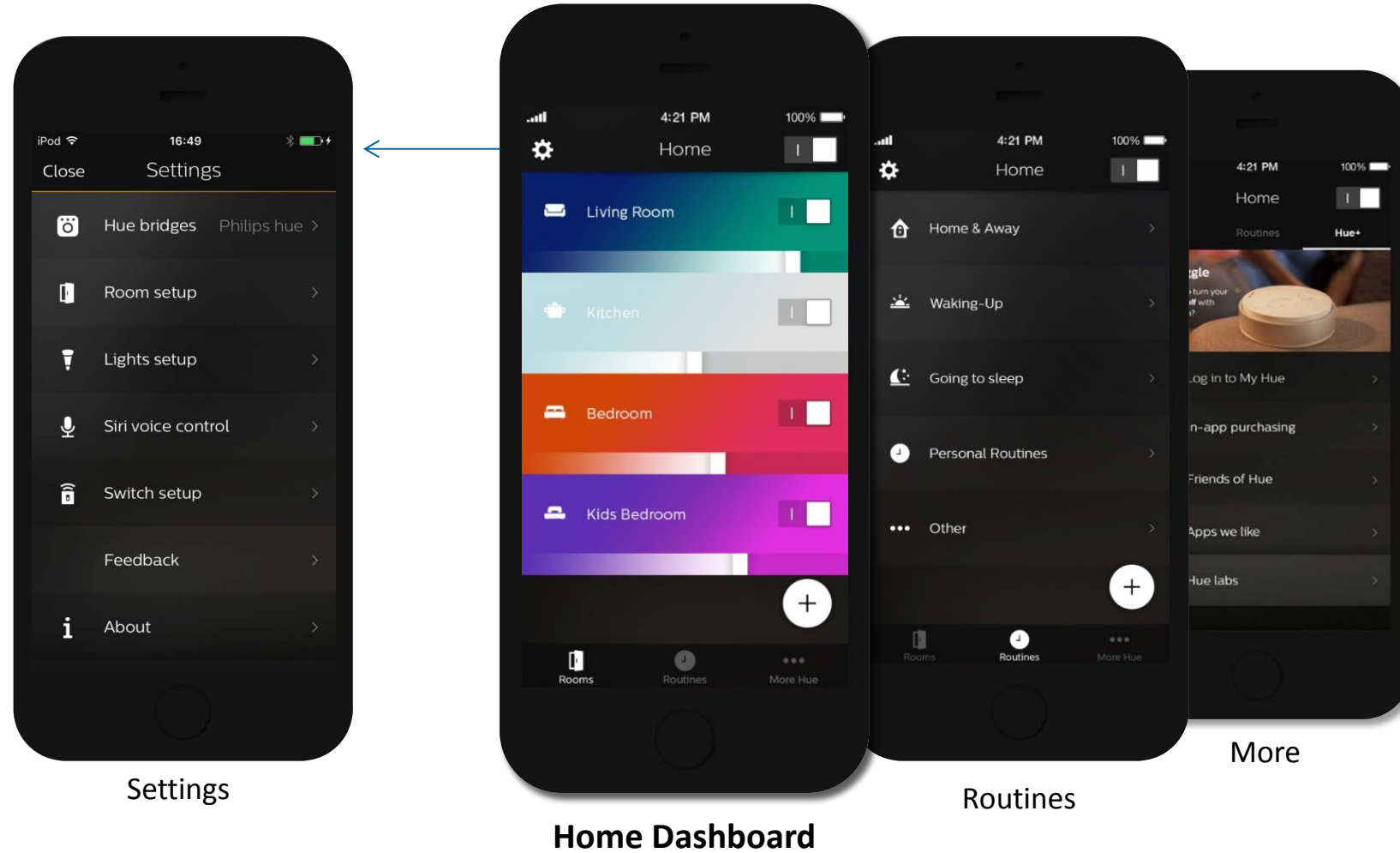


App 2.0

Never more than **1 tap away** from your **daily controls** with our new **intuitive menu**



App 2.0 Key Features



MEET **hue** NOW
Partners

Partnerships

Enhancing the value of hue





Philips Hue + IFTTT

if  **then** 



When Amazon Echo/Alexa timer hits 0, blink Hue lights

by [boucaner](#) 7.0k 99

if  **then** 



Flash lights with every in-game update for your favorite team

by [duke_seb](#) 9.8k 296

if  **then** 



Change color of lights when space station flies over a location.

by [skytland](#) 5.8k 221

if  **then** 

Turn the lights on when I get up

by [galactichero](#) 1.7k 183

if  **then** 

If it begins to rain then change the light colors to blue

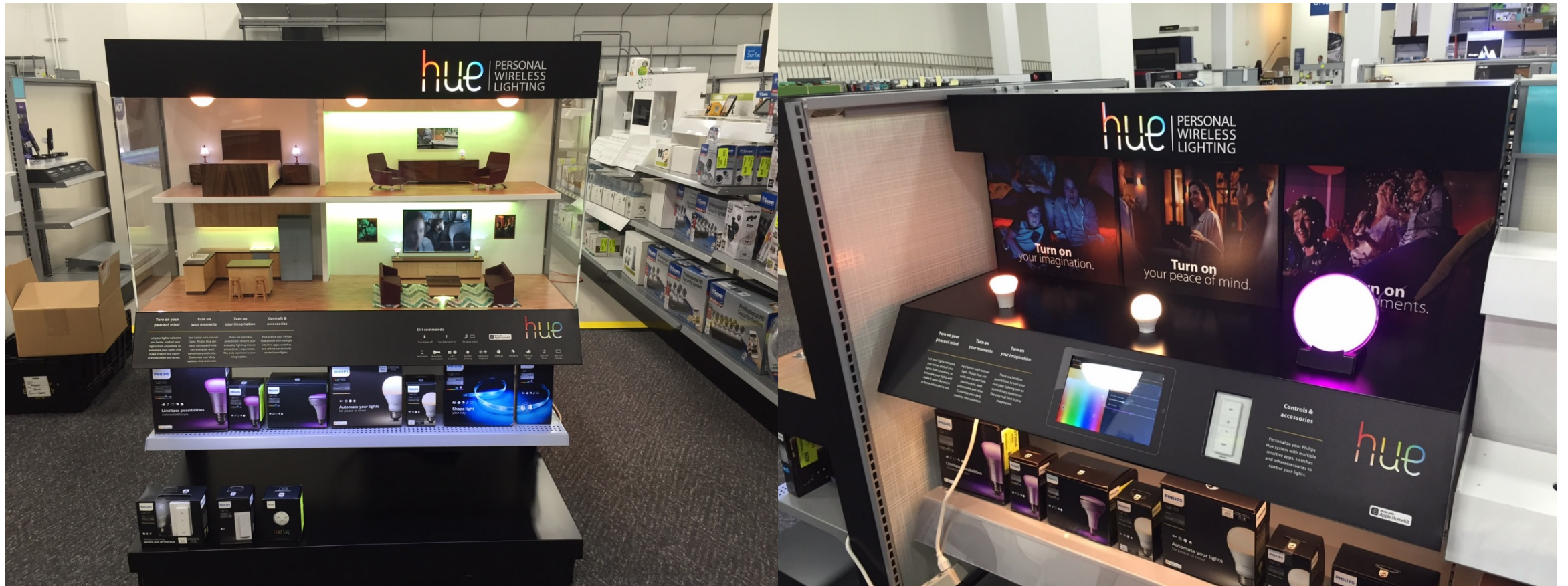
by [hue](#) 39k 1.8k



MEET **hue** NOW

In Store Display

Hue in Bestbuy







C by GE

NEEP Summit September 20, 2016
Lisa McLeer
Marketing Manager, Utilities



Smile by GE





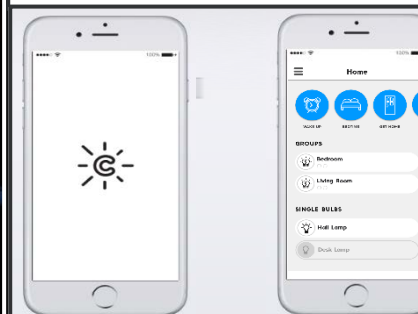
C-Life C-Sleep



GET A FREE STARTER PACK

Live the good light.

Meet C by GE. The right light for everything you do.



Life and Sleep. A complementary pair of bulbs for a full life.

Life provides superior light quality. Brightness can be easily adjusted for working or reading, or in the kitchen and bathroom. Sleep is specially developed for the bedroom, creating a calming environment at night, and energizing environment in the morning.



The right light transforms how a space looks and how you feel.

But when it comes to lighting your home, where to begin is anyone's guess. While traditional light bulbs provide different kinds of light and brightness, the options are overwhelming and the result is underwhelming.

We make it simple to get the light you need, enhancing every way you live.

With the power of LED technology, C by GE is able to create a more finely tuned, adjustable light. This leads to optimal quality bulbs that work in more situations, so there are fewer choices with better results.

Study

Cook

Hang

Life and Sleep. A complementary pair of bulbs for a full life.

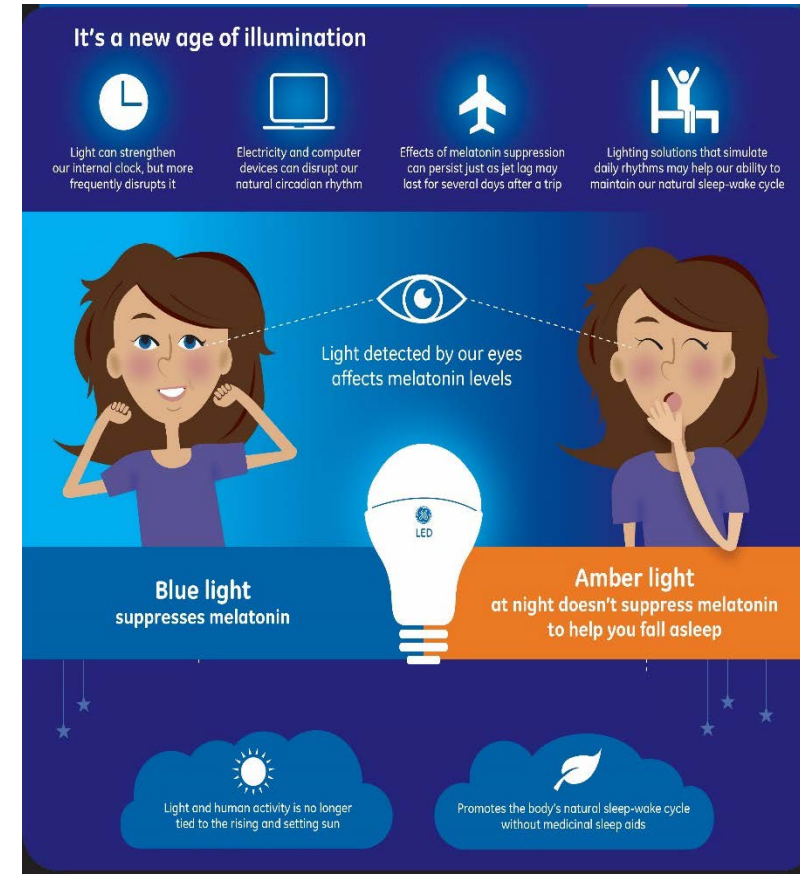
Life provides superior light quality. Brightness can be easily adjusted for working or reading, or in the kitchen and bathroom. Sleep is specially developed for the bedroom, creating a calming environment at night, and energizing environment in the morning.

No hubs, wires, or plugs. Simple to purchase, connect, and control.

Controlled by Bluetooth through our App on your smartphone or tablet, C by GE allows you to build a smart home effortlessly. Through our immersive, e-commerce site, buying light bulbs is simple, engaging and fun, with bulbs arriving to your door in innovative and informative packaging.



Lighting and Sleep



Life vs. Sleep



For every room

Finally, get all the levels of brightness you need from one bulb – from working, to cooking, to kicking back.



C-Life

You do a lot of different things throughout the day, so you need different kinds of light. C-Life makes it simple to get the optimal light at every moment – all from one light bulb.

- Dim or brighten instantly
- Group & control multiple bulbs



For the bedroom

A bulb that supports your body's natural sleep cycle – for calmer nights and more vibrant mornings.



C-Sleep

There's nothing more important than sleep. And it all starts with creating the right environment. C-Sleep creates the perfect bedroom light – warm and calm at night, crisp and vibrant in the morning.

- Dim or brighten instantly
- Group & control multiple bulbs

Lighting Facts Per Bulb

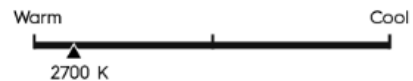
Brightness 800 lumens

Estimated Yearly Energy Cost \$1.32

Based on 3 hrs/day, 11c/kWh
Cost depends on rates and use

Life
Based on 3 hrs/day **22.8 years**

Light Appearance



Energy Used 11 Watts

Lighting Facts Per Bulb

Brightness 850 lumens

Estimated Yearly Energy Cost \$1.32

Based on 3 hrs/day, 11c/kWh
Cost depends on rates and use

Life
Based on 3 hrs/day **22.8 years**

Light Appearance



Energy Used 11 Watts



C by GE PR and Social

HGTV – DIY's *I Want That* at the 2016 National Hardware Show premieres Saturday, July 30, at 1pm ET, then encores on HGTV on Thursday, August 4, at 8am ET



Olympics - The world has come to know C by GE through six USA Olympic athletes. Followers are able to hear firsthand from world class athletes how they value sleep and use C by GE to support their own sleep cycles



How you sleep impacts how you take on the next day. Support your natural sleep cycle with the C-Sleep LED lightbulb.



Have a strong day

Get C-Sleep bulbs at Target.



Use the right light

Get C-Sleep bulbs at Target.



C by GE Media Mentions

Men's Journal (2.73M UMV)

Fast Co Innovation by Design Award – Finalist in Health Category --

<https://www.fastcodesign.com/product/c-by-ge>:



2016 Finalist for [Health](#)

Squinting at screens is tough on the eyes, and the blue light emitted by our mobile devices can disrupt sleep. C by GE is a pair of smart LEDs, called C Sleep and C Life, that change brightness to suit the time of day and mimic more subtle hues of natural light, to help our bodies adjust back to more organic rhythms and produce melatonin more effectively. They won't help wean you off your phone, but these Bluetooth-connected, app-powered bulbs will help ensure that the time you spend awake—and asleep—is healthy and productive.



11 Products to Help You Get a Better Night's Sleep



Back-to-school dorm essentials

Here's the tech you need to trick out your dorm room.



CNET (8.5M UMV)



The Best Smart Light Bulbs of 2016

C by GE Starter Pack

●●●●○ EDITOR RATING: EXCELLENT 1 COMMENT MARCH 16, 2016

173 SHARES



REVIEW

0 COMMENTS

SPECS

COMPARE

MSRP
\$50.00



PC Mag (4.6M UMV)



Smile by GE





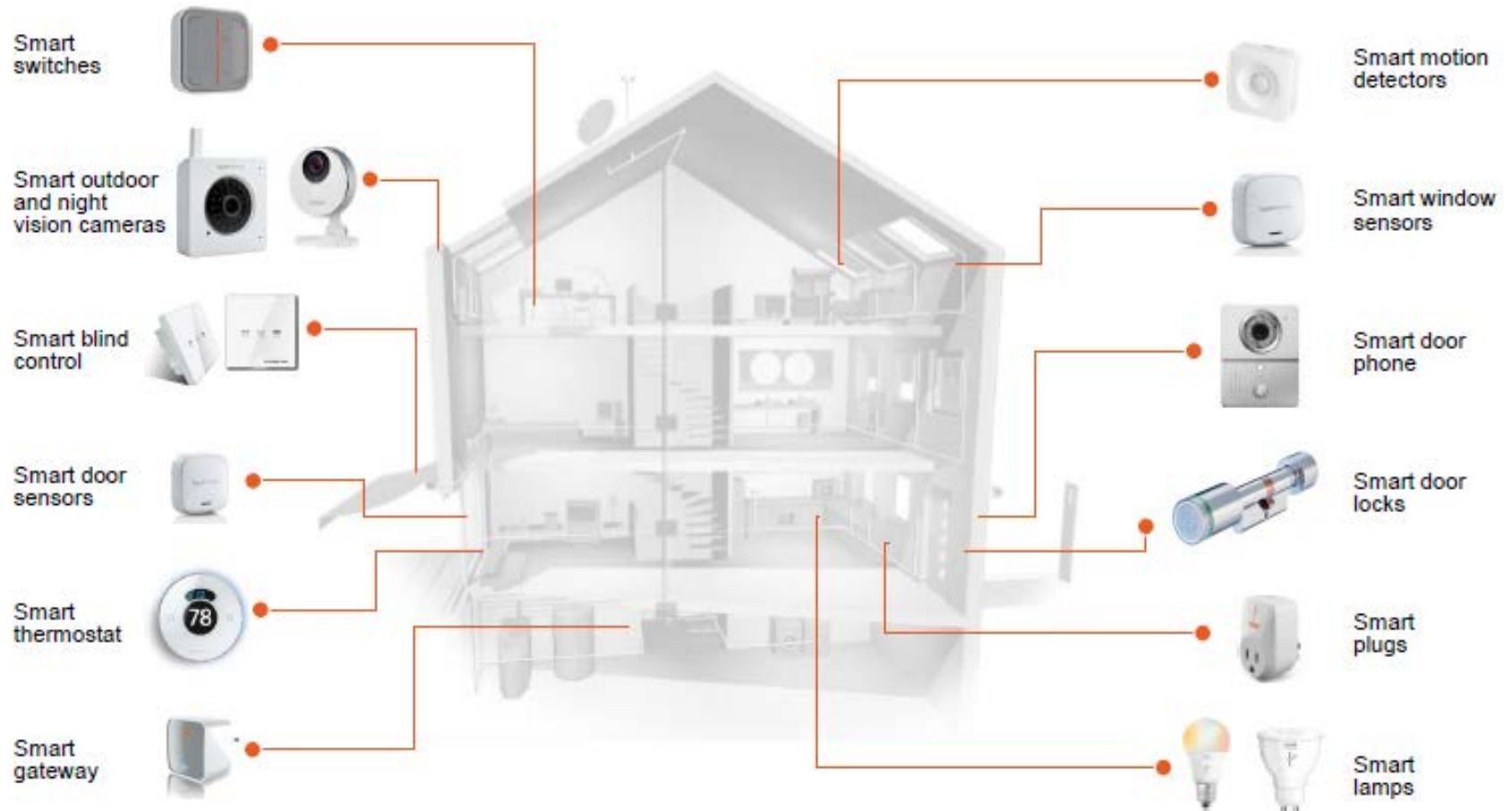
LIGHTIFY®

Smart Connected Lighting

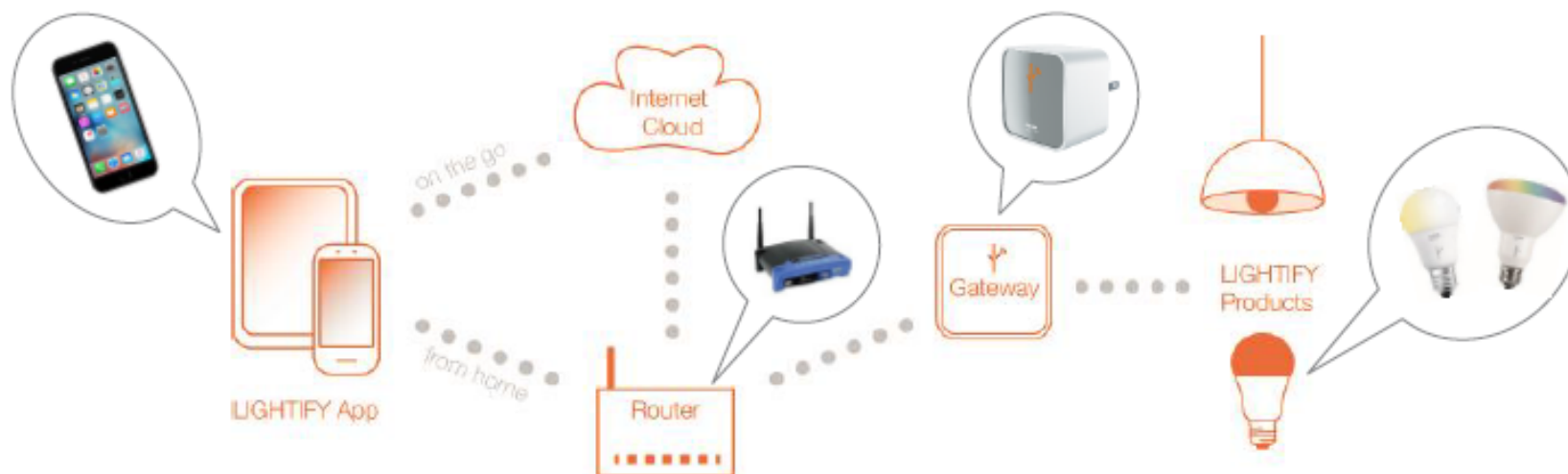


Christopher Lubeck
Head – Utility Relations
LEDVANCE/SYLVANIA

LIGHTIFY® - Vision



LIGHTIFY®



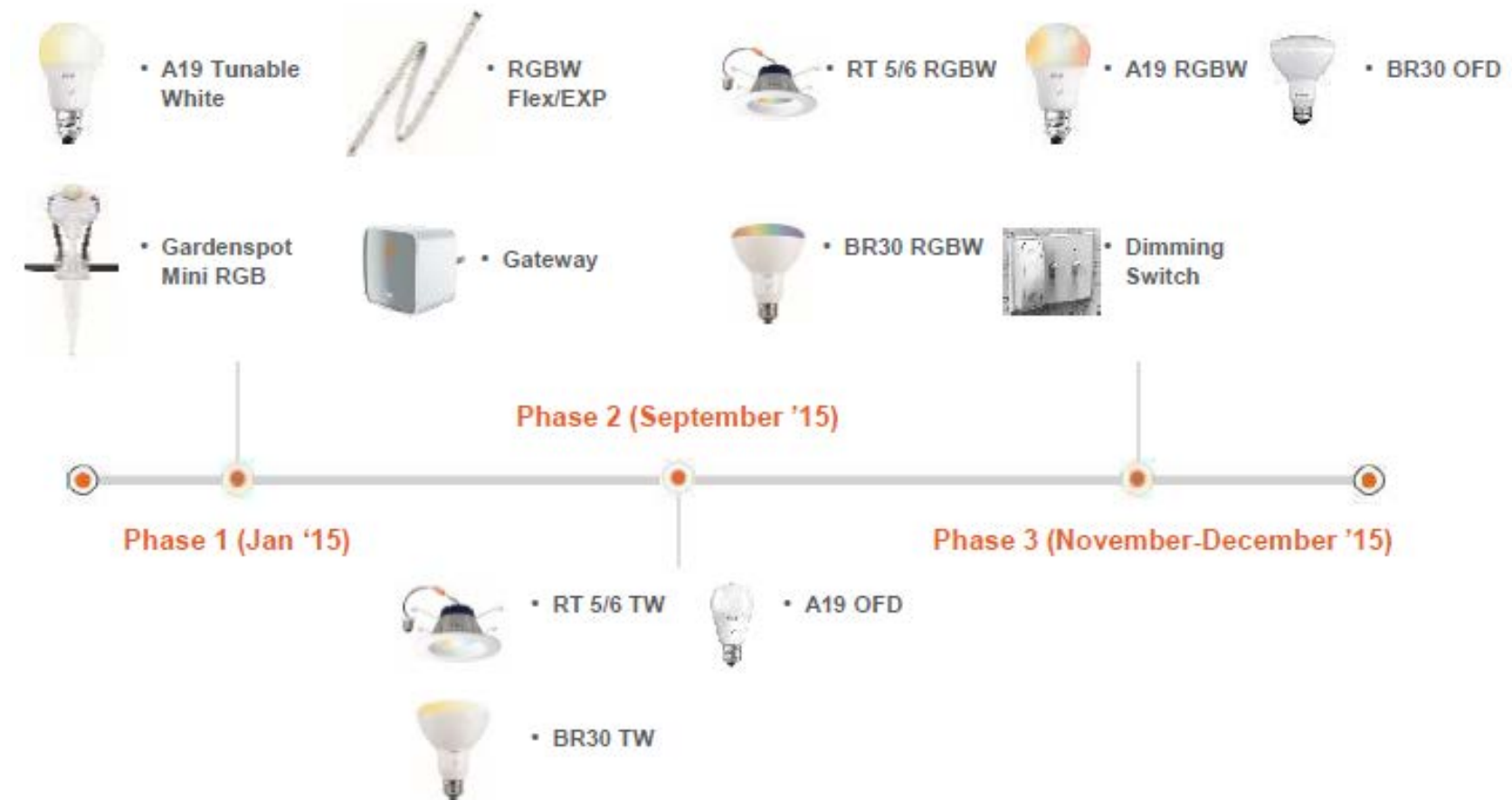
Platform Overview

- "Wire free" gateway that connects to your home router or cable modem over WiFi
- Mobile App connects to the gateway via WiFi or cell connection to control lights, groups, and scenes
- Gateway connects to the LIGHTIFY products using ZigBee (maximum of 50 devices per gateway)
- Gateway and cloud API's to allow developer access

Differentiators

- Simple to setup groups and scenes designed to provide functional and automated home lighting
- Broad portfolio of smart lamps, luminaires, and components
- Products for both indoors and out
- ZigBee sensors/switches to augment the mobile app
- Widest color temperature ranges in the industry, 1900K candle light up to 6500K daylight

LIGHTIFY® - Today



LIGHTIFY®

Better



Function: on/off/dim

Uses: basic wireless lighting, safety & security applications, provides grouping across several electrical circuits

MSRP: \$15-\$39

Best



Function: High CRI tunable white (TW)

Uses: personalized color temperature, "one size fits all" white choice, circadian tuned scheduling

MSRP: \$29-\$39

Premium



Function: high CRI full color + tunable white (RGBW)

Uses: High quality white, experiential/mood lighting, entertainment & theater, outdoor decorations, party lighting

MSRP: \$39-\$49

Key Points

- SYLVANIA treats its' LIGHTIFY products as quality LED lights first, connected second
- All LIGHTIFY lights are full 60W equivalent or higher, and do not compromise on colors
- SYLVANIA offers a full portfolio of cost effective indoor and outdoor lighting products

LIGHTIFY® In Use



LIGHTIFY® - Fall 2016



LIGHTIFY® In Use



Questions

LIGHTIFY Light Sources Currently Work With:





SEPTEMBER 20, 2016

Smart Lighting & Smart Hub DIY Install

REPORT ON A
2015 Efficiency Vermont R&D Project

Jasmine Rivest
Program Manager



Enter: Smart Lighting



How viable is it for an EE program?

- Map the baseline energy use of smart lighting
- Understand participants' "out of the box" experience with installation & use

The Study

- 15 homes: 5 smart bulbs | 5 regular bulbs
- Light loggers measuring Hours of Use (HOU)

What did we find?



Nota Bene: The 15 home sample-size is not statistically significant. Further study is warranted to verify these results.

Smart bulb projected annual HOU

- Close to or less than 1,000 hours/year
- Less than our standard lighting program HOU

Compared to standard / non-smart bulbs in Northeast Residential Lighting (NRL) study

- Up to 27 % reduction in HOU with smart bulbs

Other Program Considerations

No statistically significant HOU difference in:

Homes that Regularly Used Automation

- Opportunity for Efficiencies in Scheduling



Manufacturer's Ecosystems

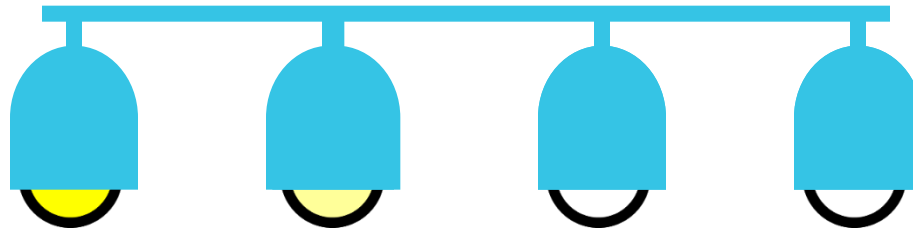
- Program could be scaled across manufacturers assuming strict selection criteria

Old Dog, New Tricks?



Unexpected Use Cases

- Remote control of single bulb in circuit



- Correcting for inopportune switch placement



The Dimming Opportunity

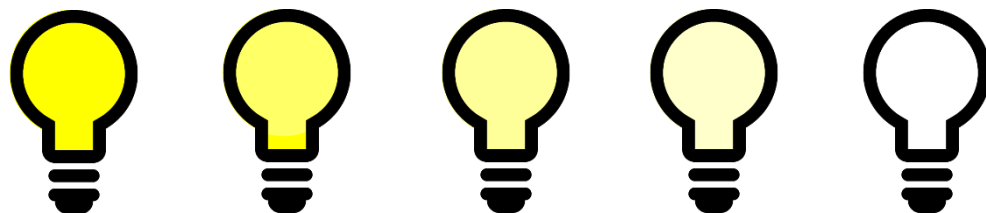


Smart bulbs make dimming possible where none had existed before.

- In the average home: 10 % of bulbs are on dimmer switches

Participants dimmed bulbs 38% of the time

- Additional energy saving opportunity beyond Hours of Use (HOU) alone



Where do we go from Here?

In an ideal set-up, with major industry barriers removed...

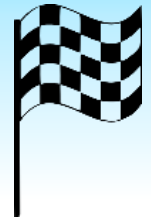
- Installation experience – not a major blocker
- Indicates viability for a retail program

Given this price point, would you recommend?



At \$15 / bulb, cost not a barrier.

The Road Ahead



- Promising initial results for smart bulb HOU compared to non-smart bulbs. Further study needed.
- Significant opportunity for dimming
- With major industry barriers removed, participants were largely able to self-install
 - Potential for retail program with careful product selection



Thank you!

Jasmine Rivest

JRivest@efficiencyvermont.com

802-540-7651

Find the Full Report Here:

www.efficiencyvermont.com/news-blog/whitepapers

Discussion

- How can smart lighting get incorporated into program plans?
- Is there verifiable energy savings from smart lighting?
- Can the benefits outweigh the costs?
- Where will these prices go?
 - Will a smart lighting program be cost effective?
- Opportunities without a hub?

