

# From Market to Meter: Effects of Lighting Market Dynamics on Residential Energy Consumption

*Presented at the 2017 ACEEE National  
Conference on Energy Efficiency as a Resource*

Bonneville  
POWER ADMINISTRATION



NAVIGANT

# The Market is Changing



Cheap & Abundant LEDs



Effective EISA Regulation

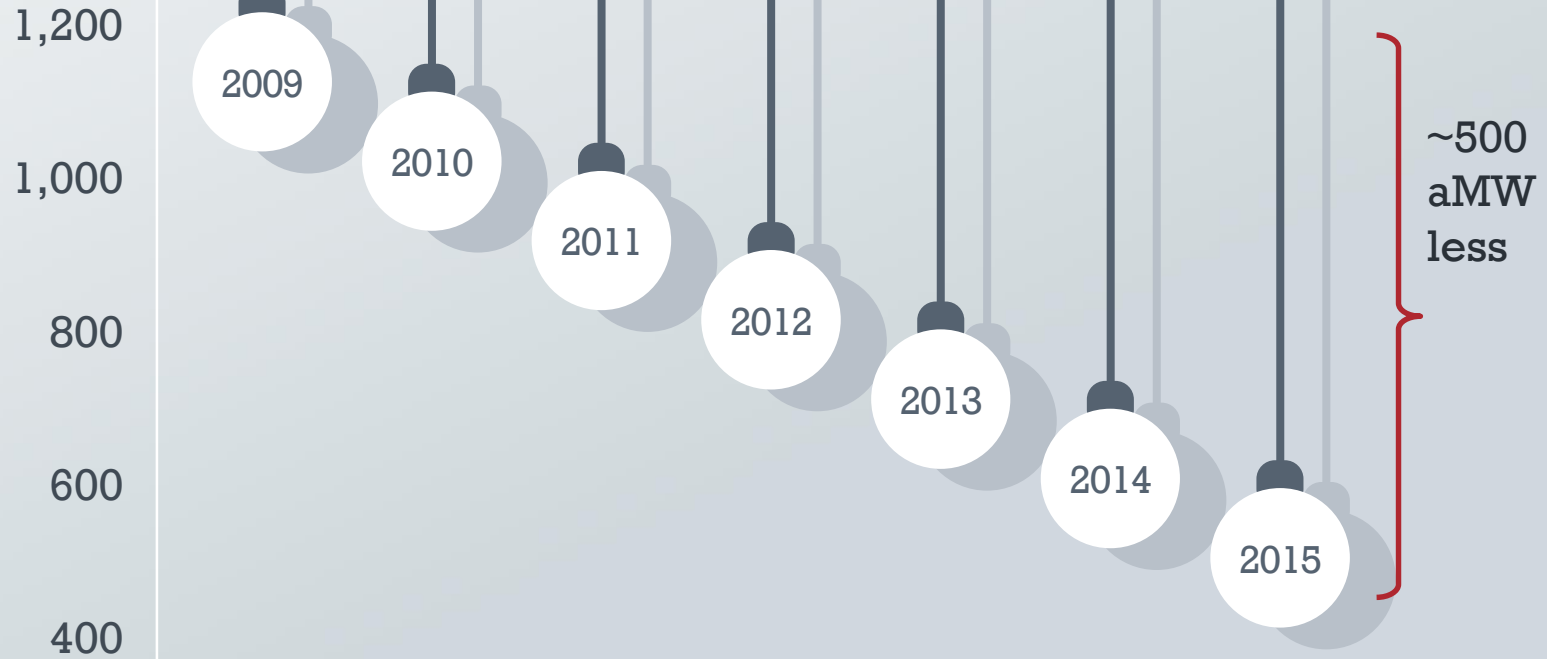


Divestment in CFLs



Effective Program Activity

aMW CONSUMPTION

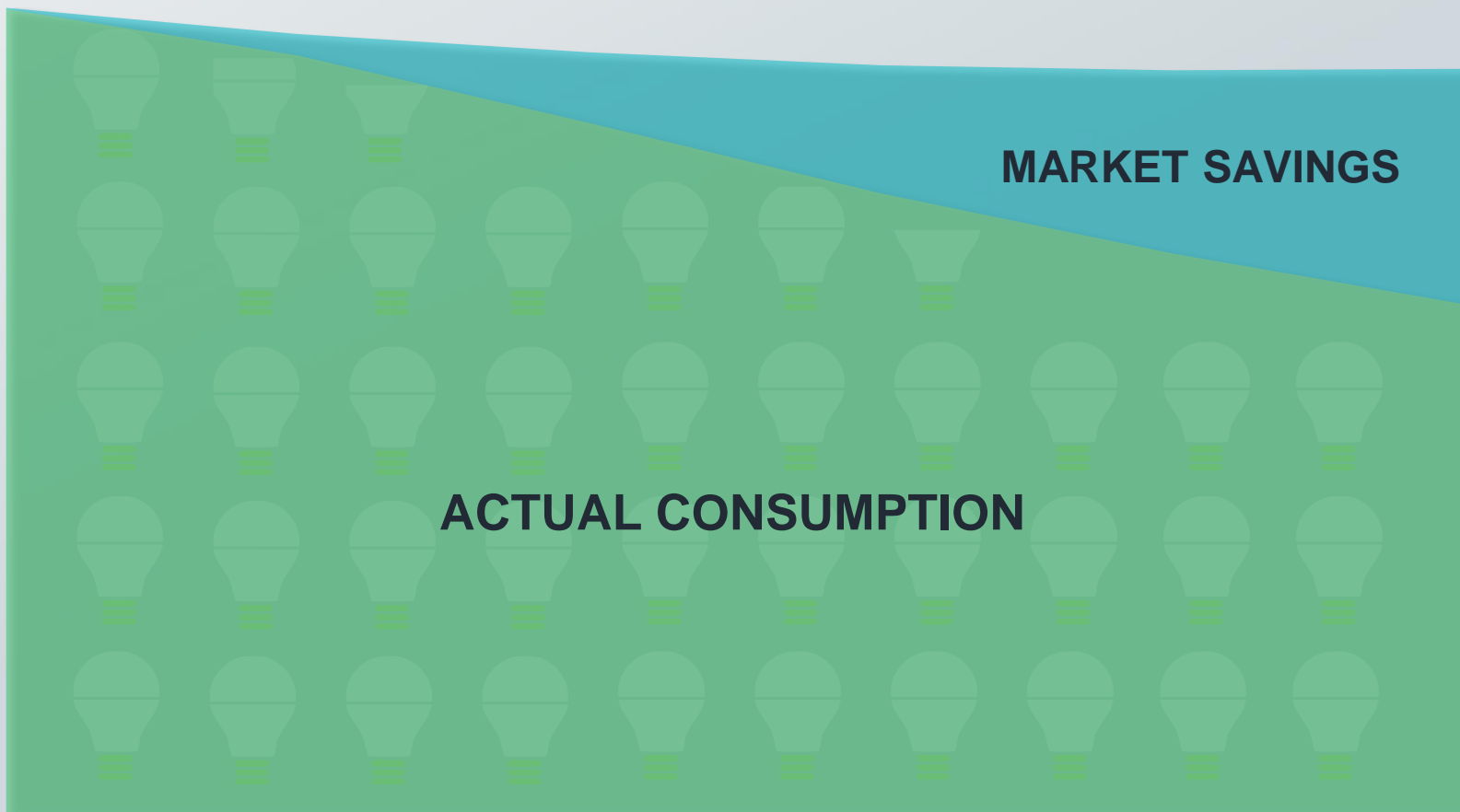


**39% decline in Northwest lighting consumption**



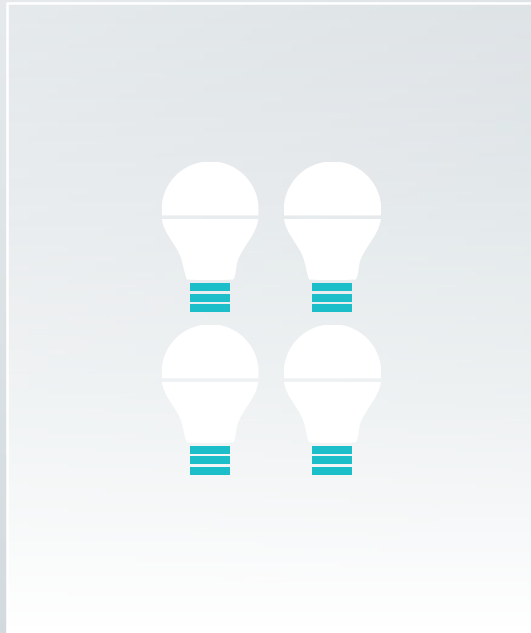
**Thinking  
differently  
about energy  
efficiency**

# Looking at the entire market



# Every Lamp

66.5 million



# Every Socket

309 million



# Every Home

5.8 million



Number and Mix  
of Lamps per Home  
Average Lamp Age  
Hours of Use  
Existing Residential  
Housing Units  
Average Lifetime and  
Wattage

**Existing Homes**



New Housing Units  
Number and  
Mix of Lamps  
per Home

**New Construction**



**TOTAL  
REGIONAL  
CONSUMPTION**

Nielsen  
Sales Data  
Residential  
Building Stock  
Assessment  
Retail Lighting  
Long-term  
Market Tracking



Regional  
Housing Stock

SEVENTH  
NORTHWEST  
POWER PLAN

National lighting  
model cost and  
lifetime estimates

U.S. DEPARTMENT OF  
**ENERGY**

Residential  
Lighting Market  
Research  
Interviews



# Data Sources

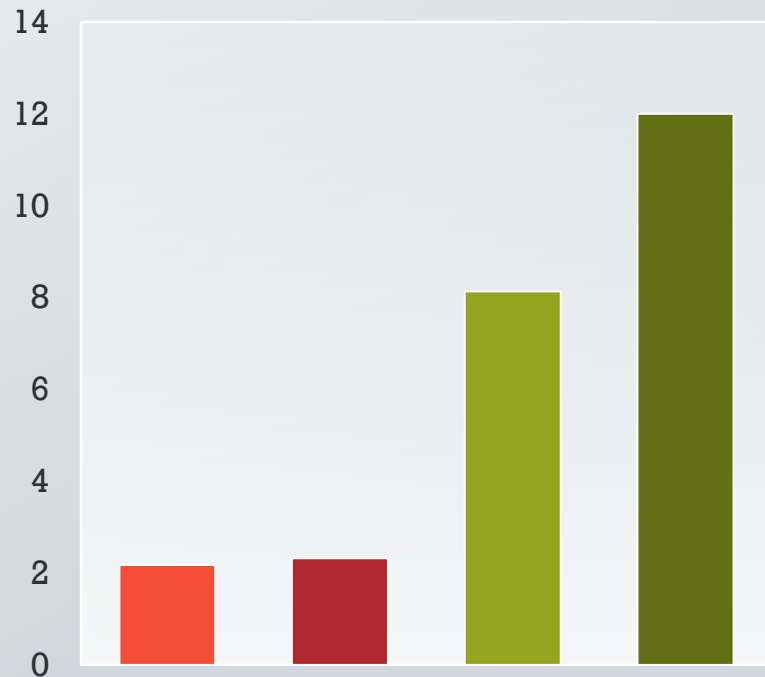


**Consumption  
models can  
tell us a lot  
about the  
market**

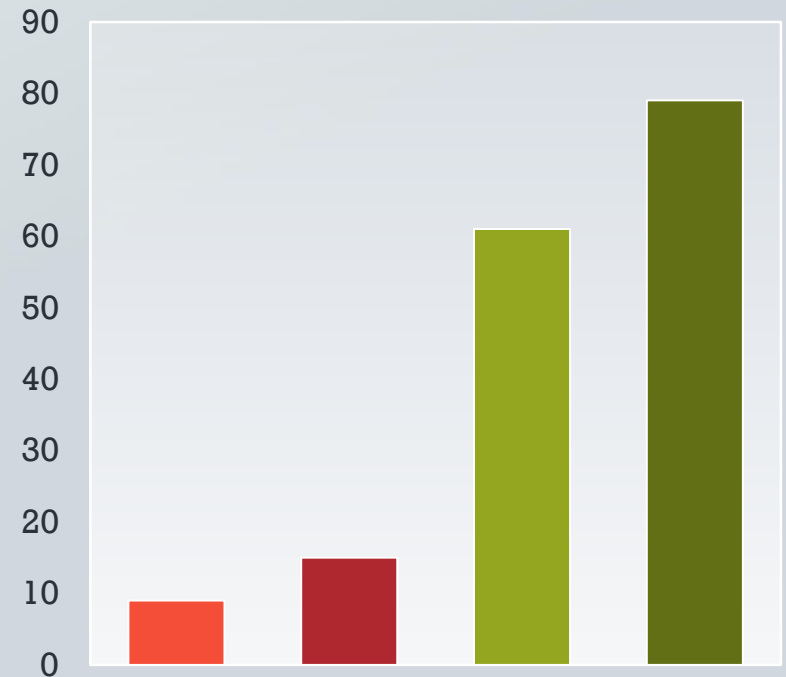


# LED > CFL > Halogen > Incandescent

Lifetime (years)



Efficacy (lumens/Watt)



Incandescent

Halogen

CFL

LED

LAMP SALES IN MILLIONS

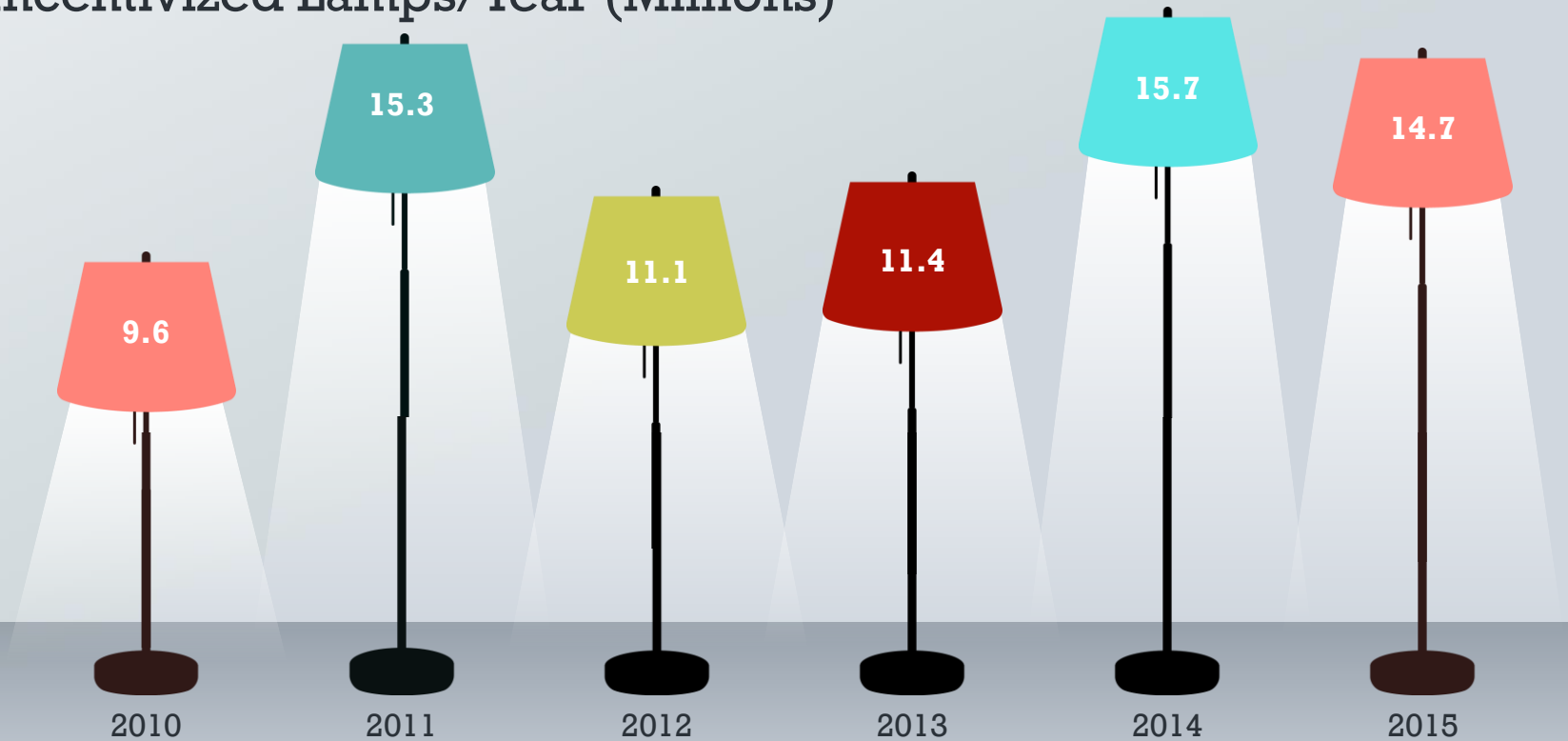
100  
90  
80  
70



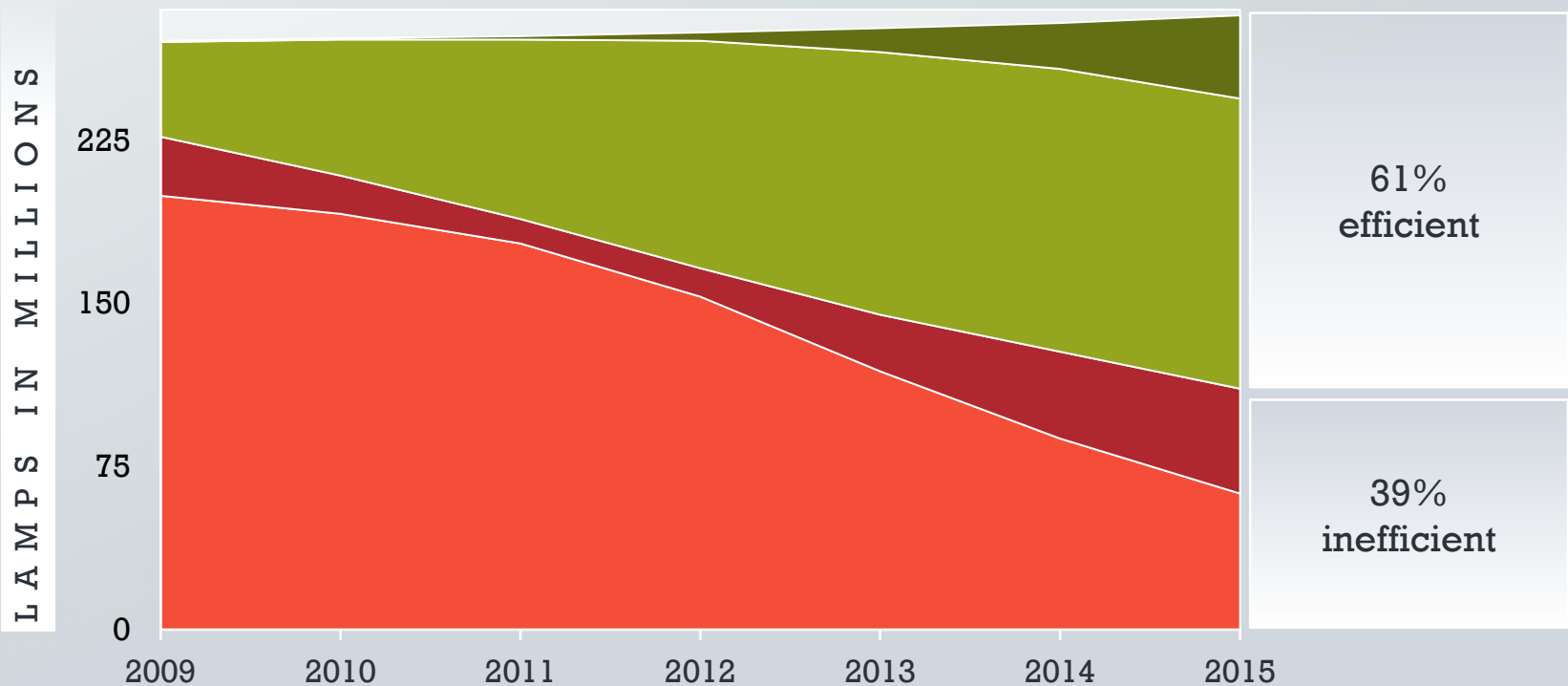
**Longer life = Fewer sales**

# Programs incented 50% of CFLs and LEDs

Incentivized Lamps/Year (Millions)



# CFLs and LEDs are growing in the stock

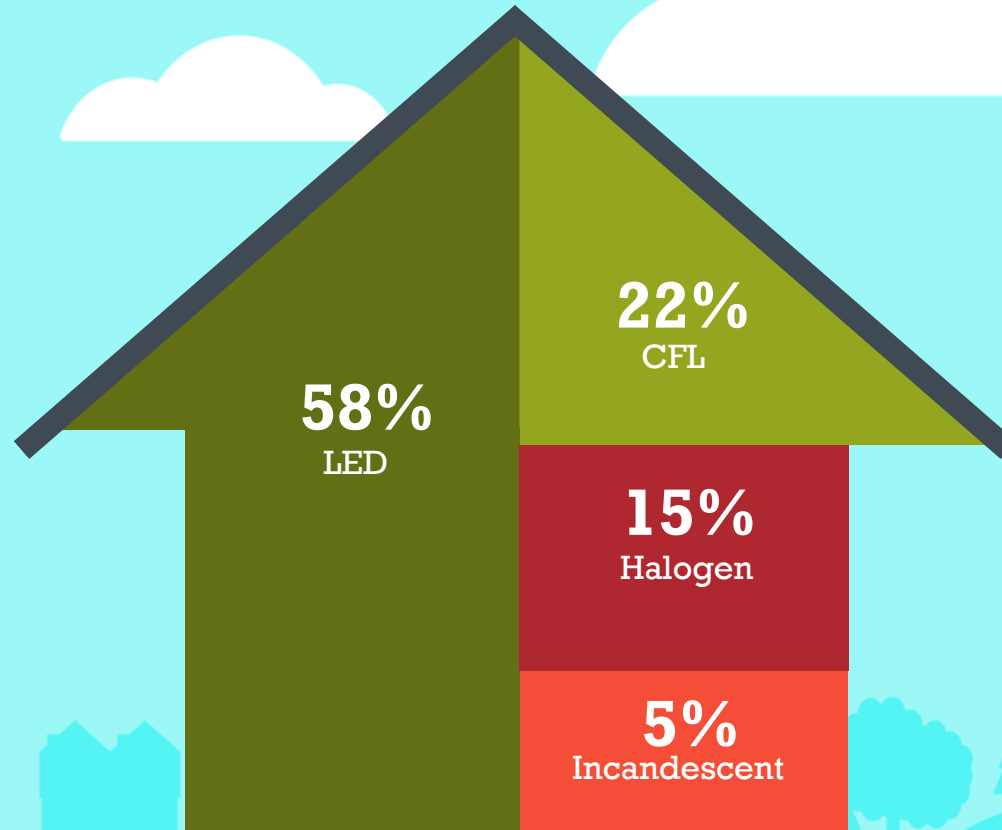


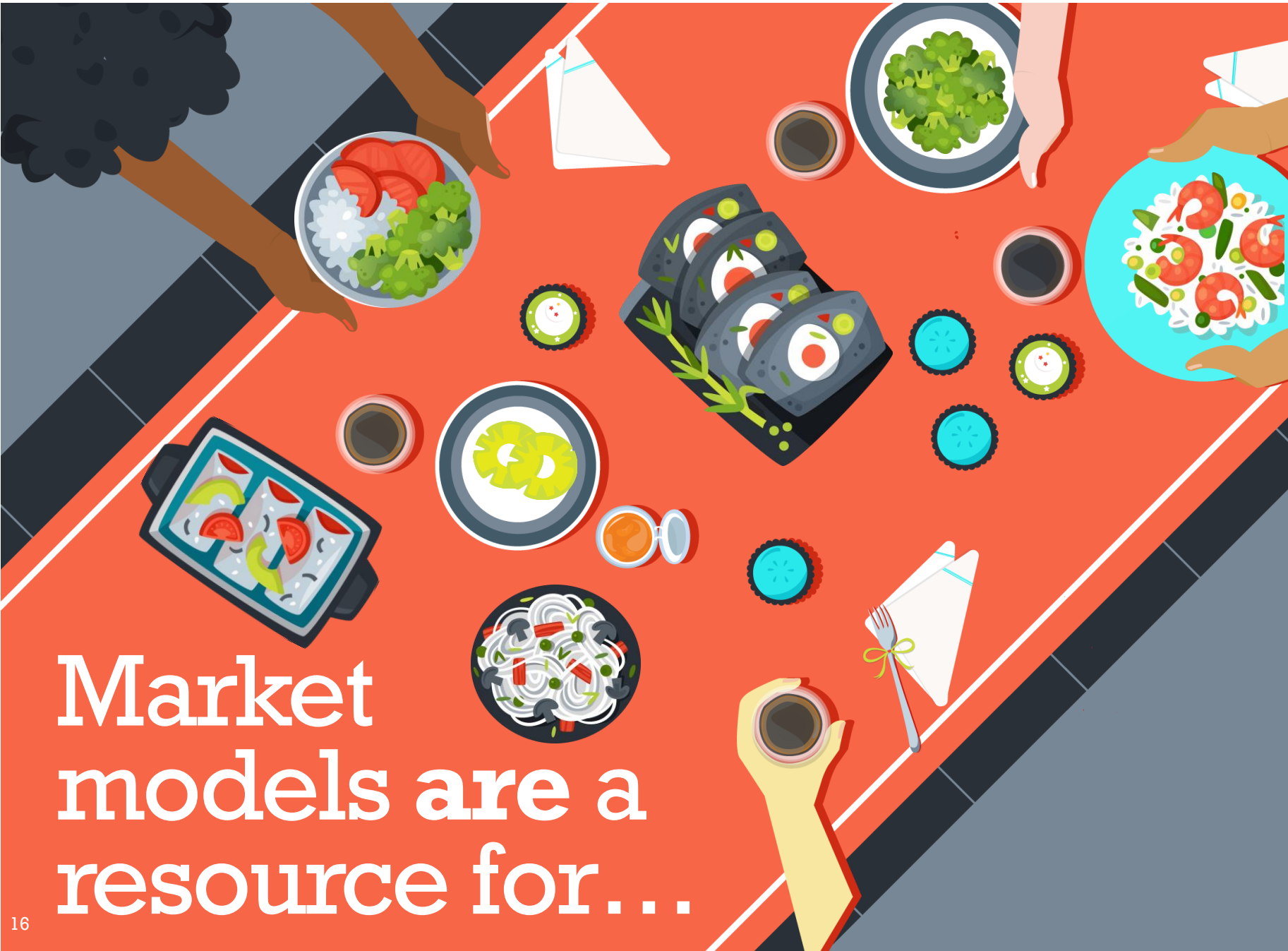


**LEDs are reshaping  
the region's lighting stock.**

# Looking ahead

LEDs projected to be 58% of lighting stock by 2020

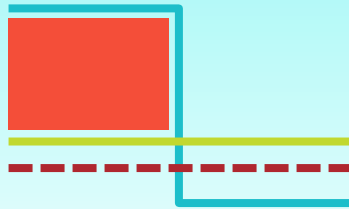




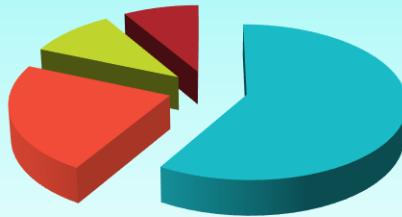
Market models are a resource for...



# Measure Updates



Baselines



Market Shares



Costs



# Program Planning

Identifying remaining opportunities by application, region, delivery channel

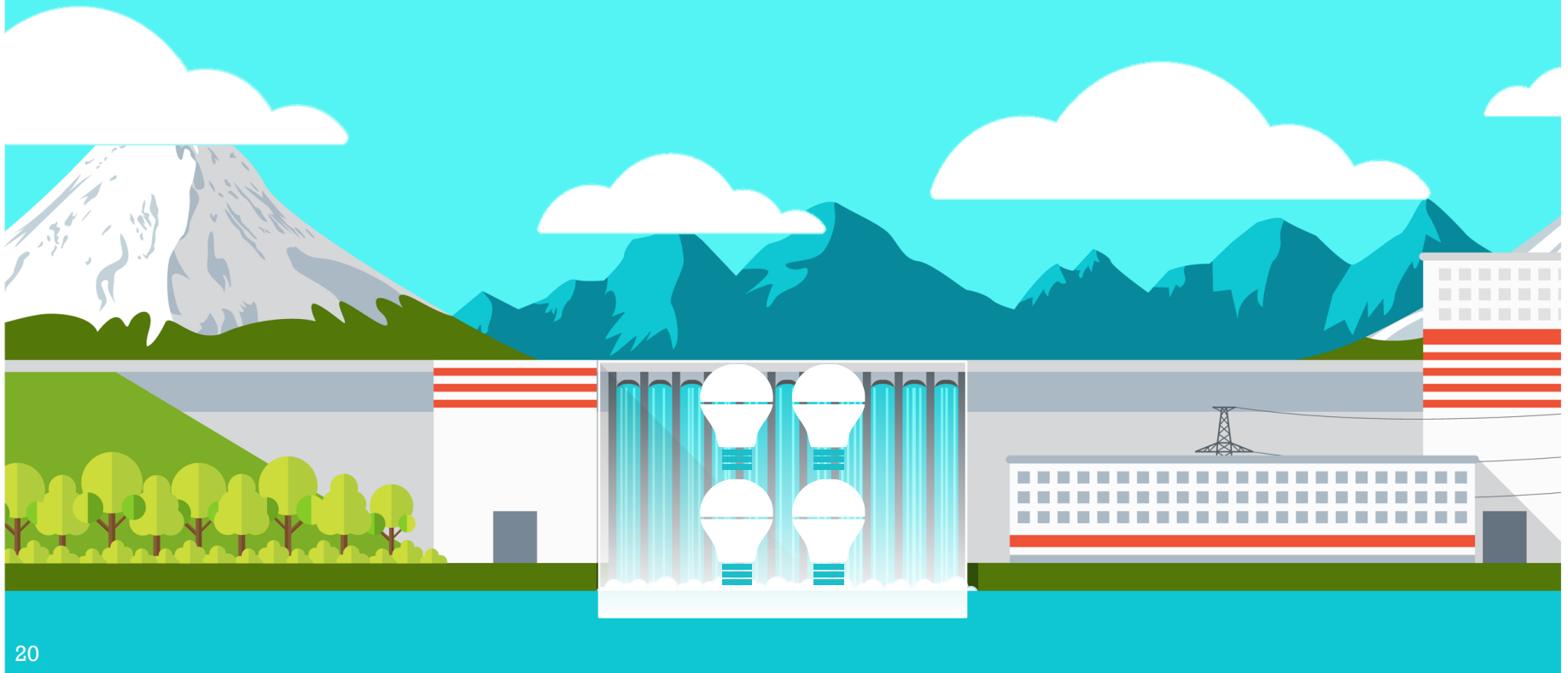




# Regional Power Planning

More detailed than the current methodology for estimating residential lighting load; forecast to 2020

# Uncertainty remains in measuring the EE resource



# Conclusions



Market perspective  
demonstrates full  
effects of EE



Modeling markets  
provides value to  
programs and  
power planners



Wider adoption of  
market modeling  
can help refine  
methodology

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