

THE
FUNDAMENTALS

OF MOMENTUM SAVINGS

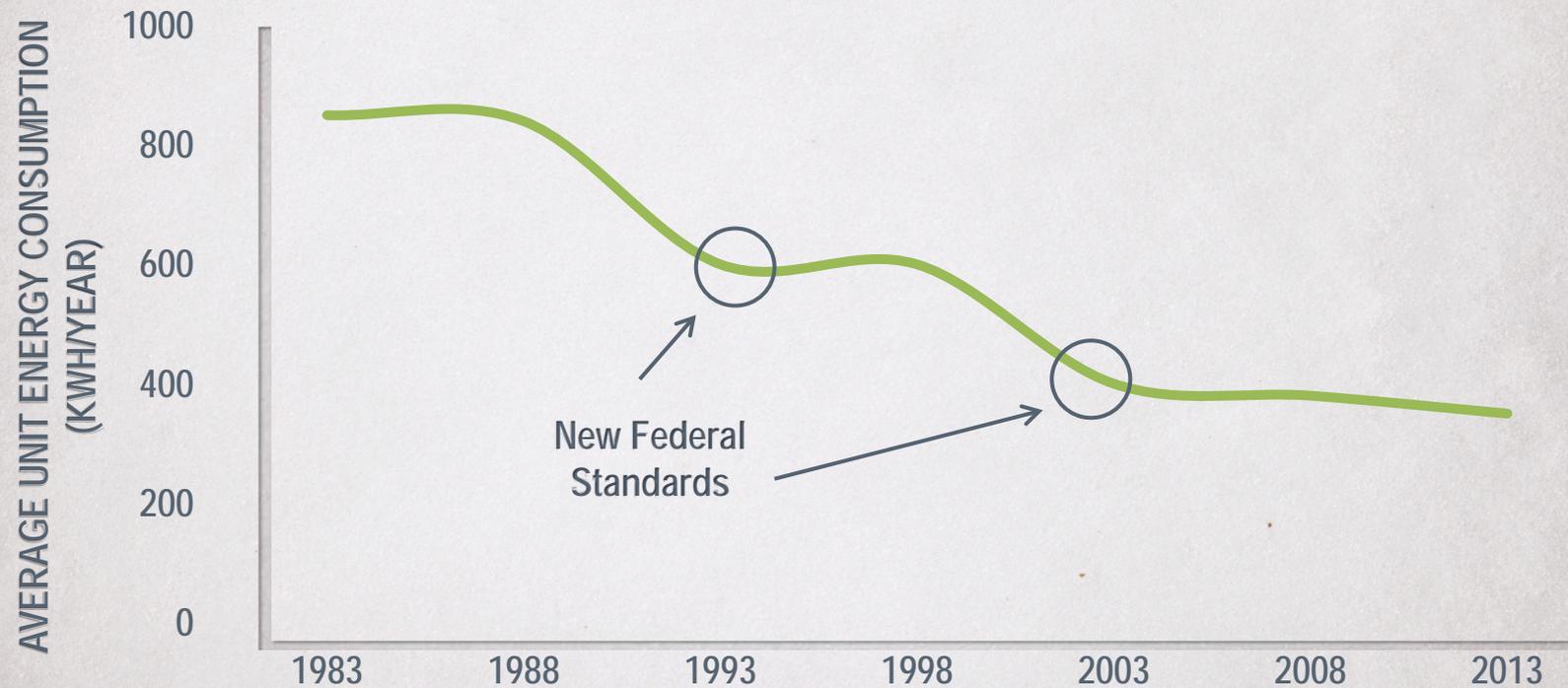
Bonneville
POWER ADMINISTRATION



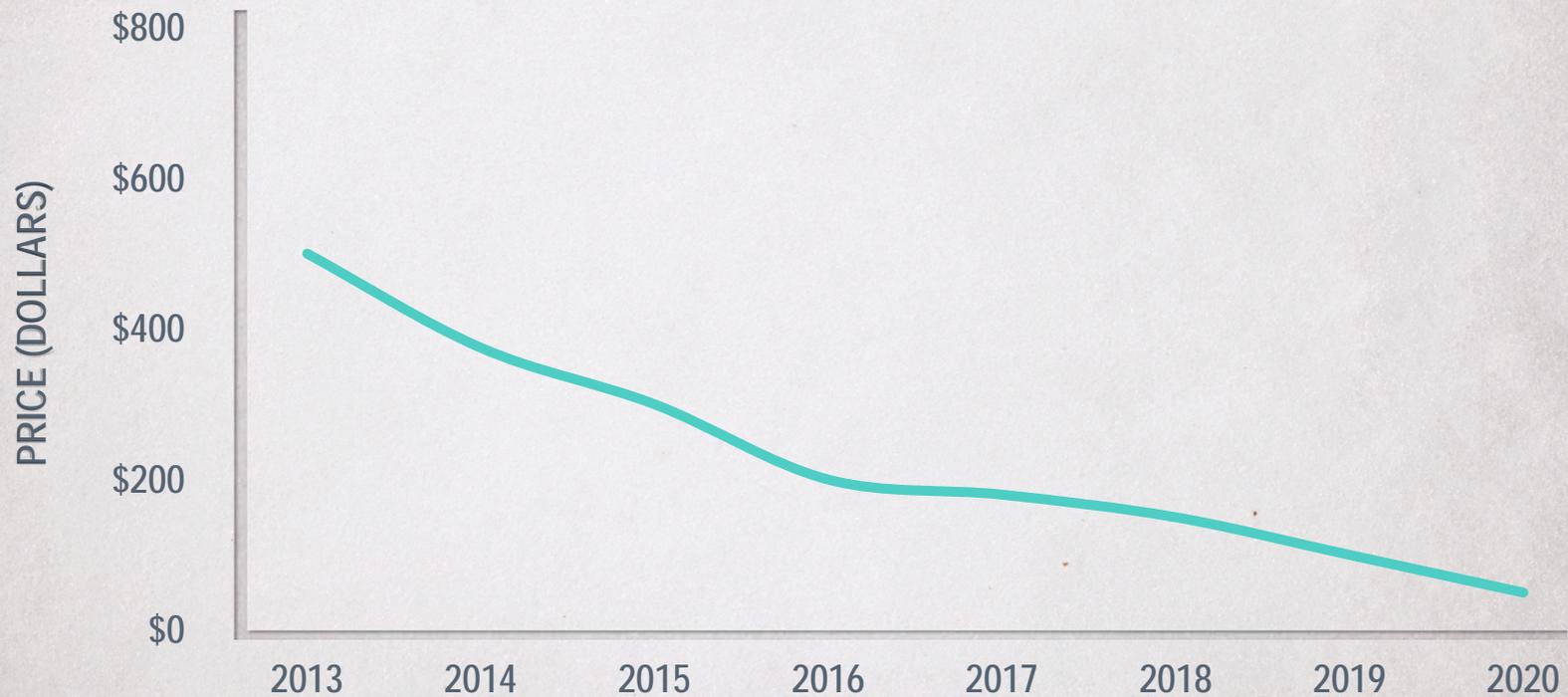
MARKETS CHANGE



CLOTHES WASHERS MARKET



LED LUMINAIRE FORECASTED PRICES





STOCK VS. FLOW

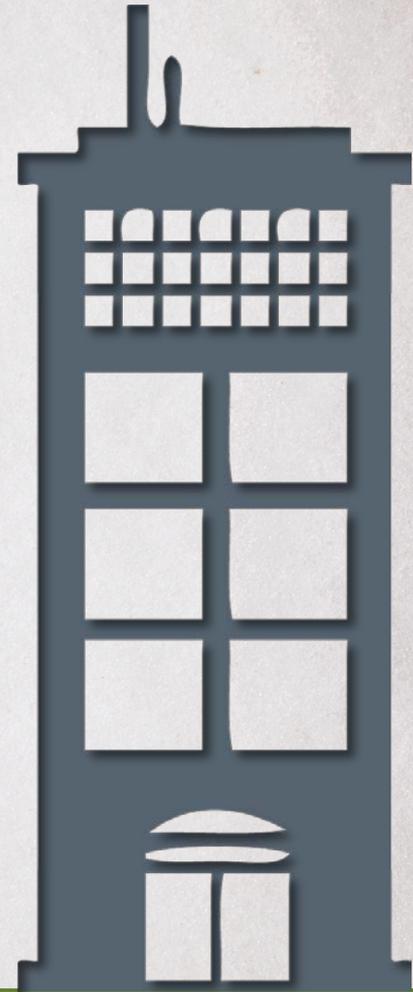
STOCK



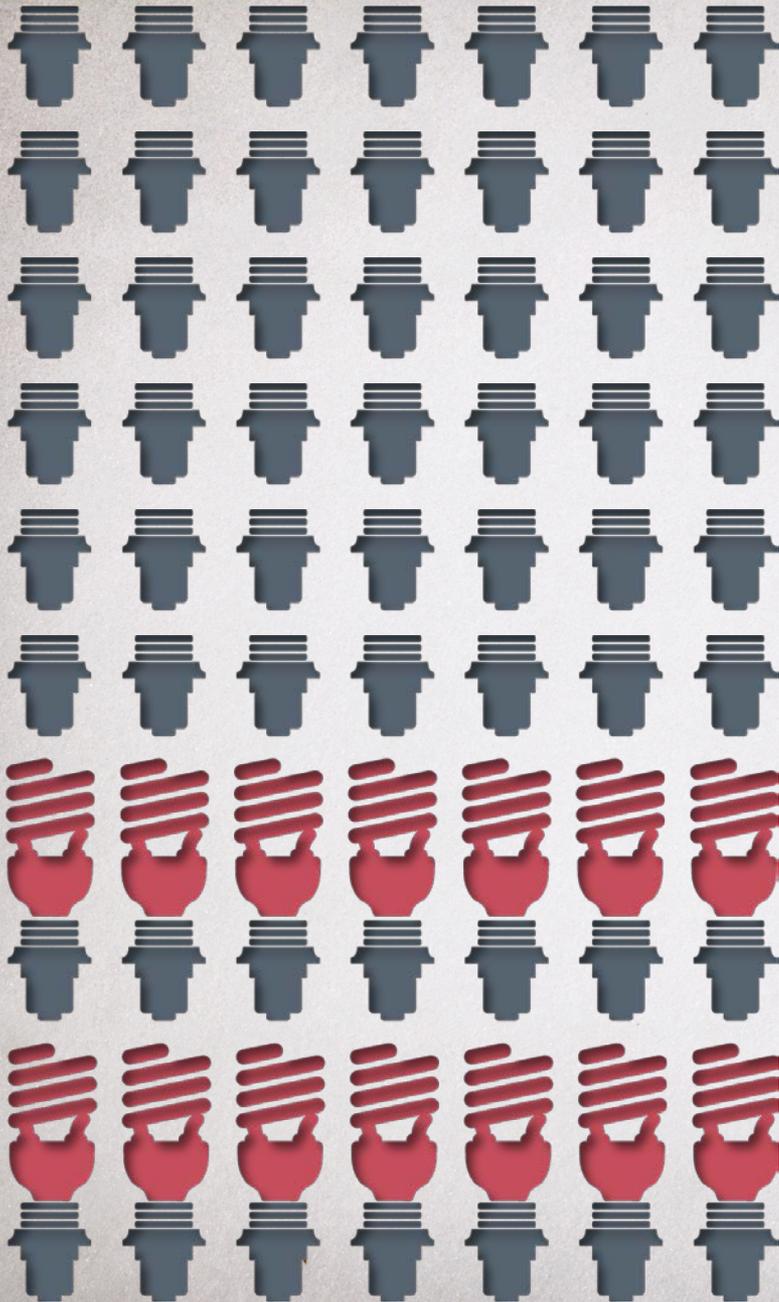
NEEA'S BUILDING STOCK ASSESSMENTS



Residential



Commercial

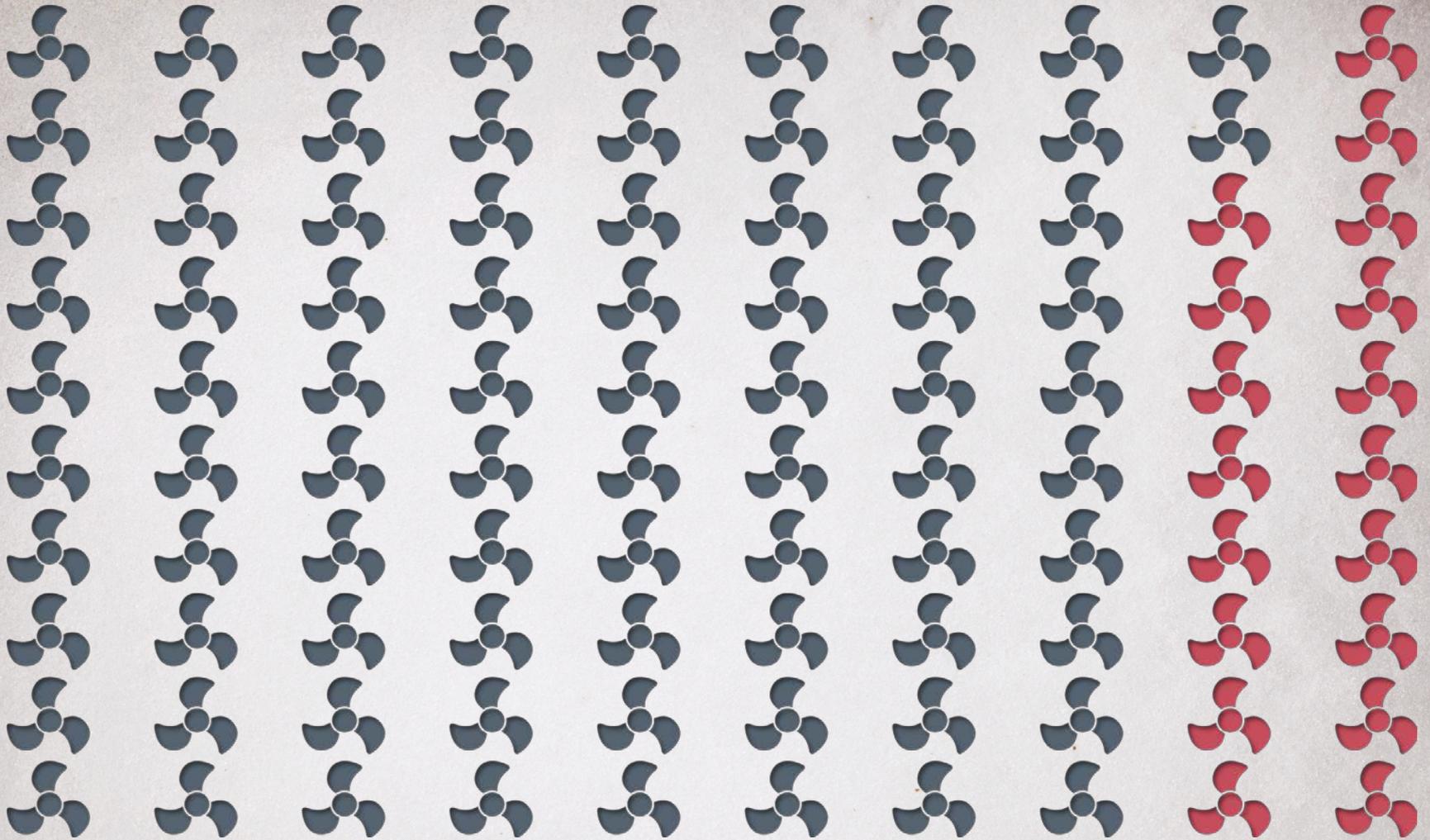


The Northwest has over 285 million residential light sockets.

IN 2011, THE NORTHWEST HAD **25%** OF SOCKET SATURATION OF CFLS.

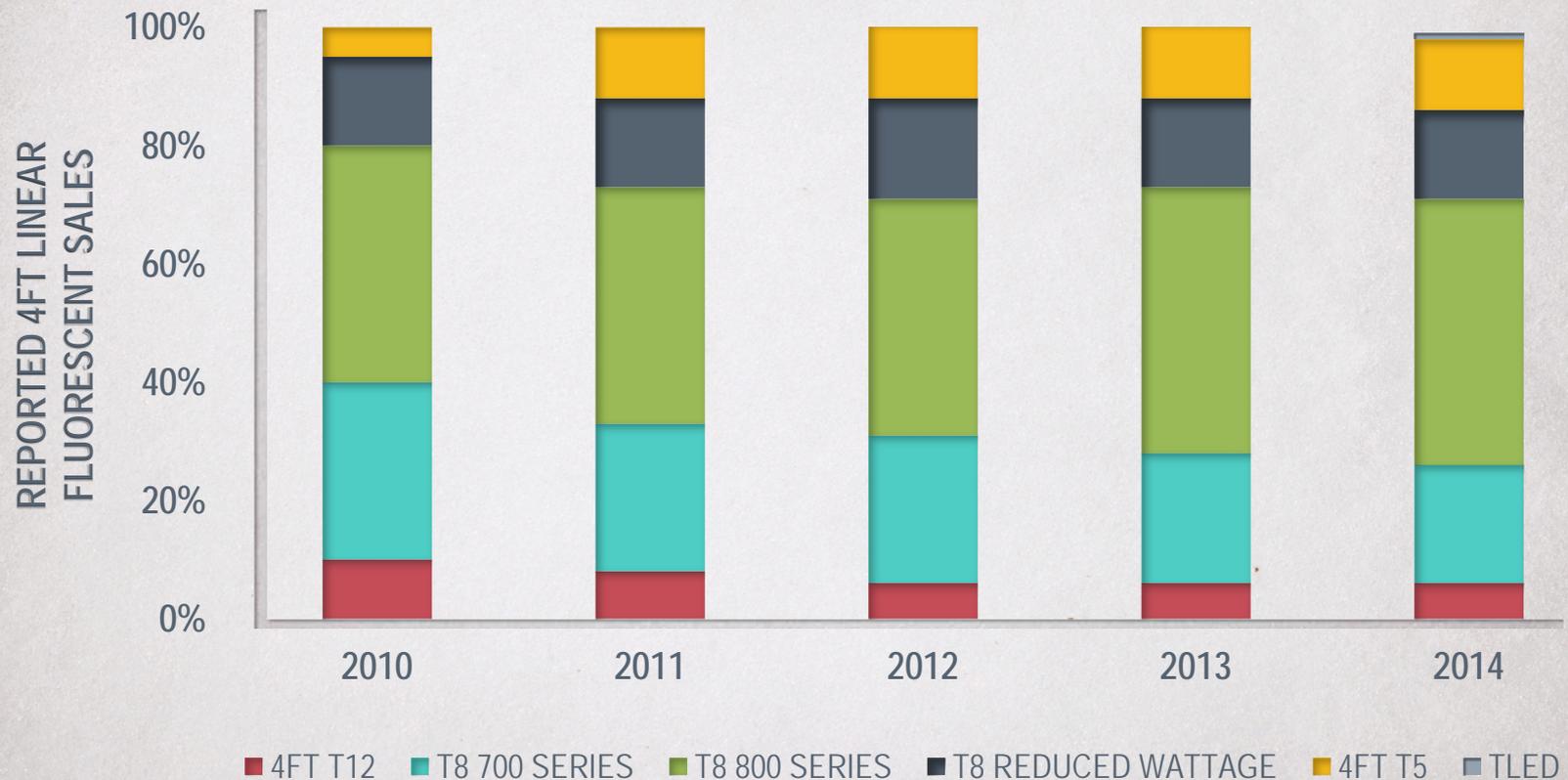


FLOW



18% OF AIR SOURCE HEAT PUMPS SOLD
were high efficiency (HSPF of 9.0 or greater) in 2014

REGIONAL SALES, LINEAR FLUORESCENT LAMPS



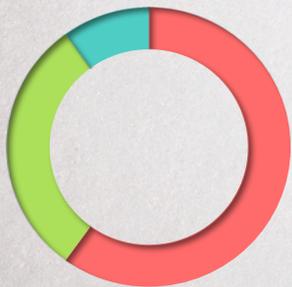
Source: Navigant and Cadeo Analysis of Distributor Sales Data

TAKE-AWAYS

1. MOMENTUM SAVINGS OCCUR WHEN MARKETS CHANGE
2. STOCK REPRESENTS PAST DECISIONS; FLOW REPRESENTS CURRENT DECISIONS



THE EFFICIENCY MIX

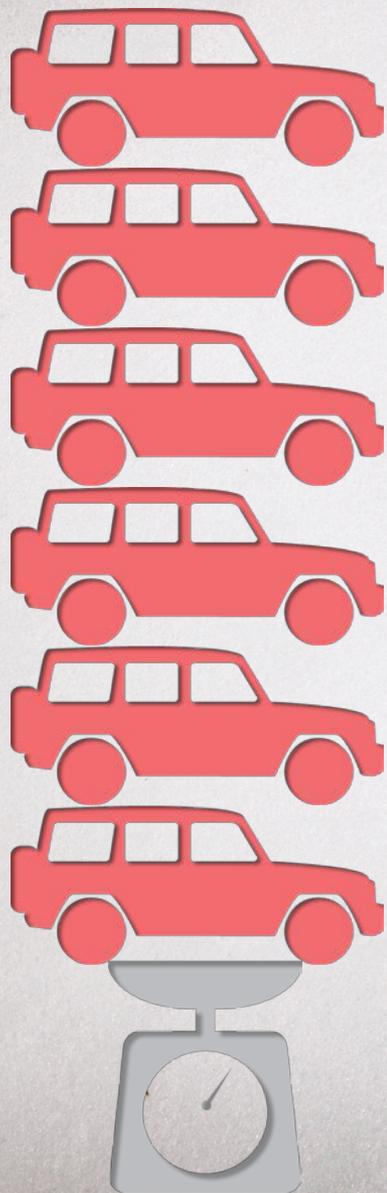


THE EFFICIENCY MIX

is the distribution of sales that fall within each efficiency level in a given market in a given year

UNIT ENERGY CONSUMPTION (UEC)





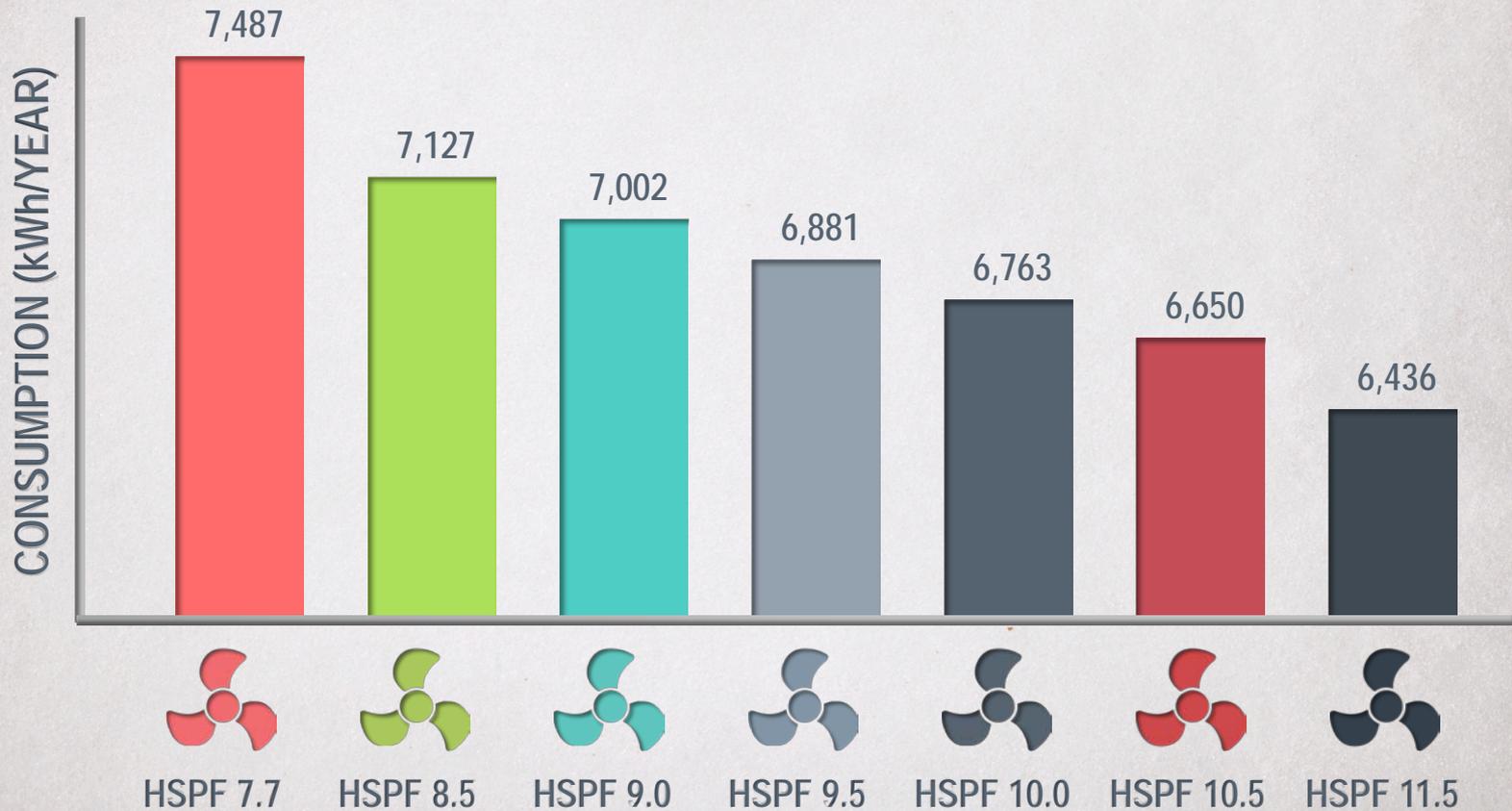
UEC WEIGHTED BY EFFICIENCY MIX



UEC WEIGHTED BY EFFICIENCY MIX

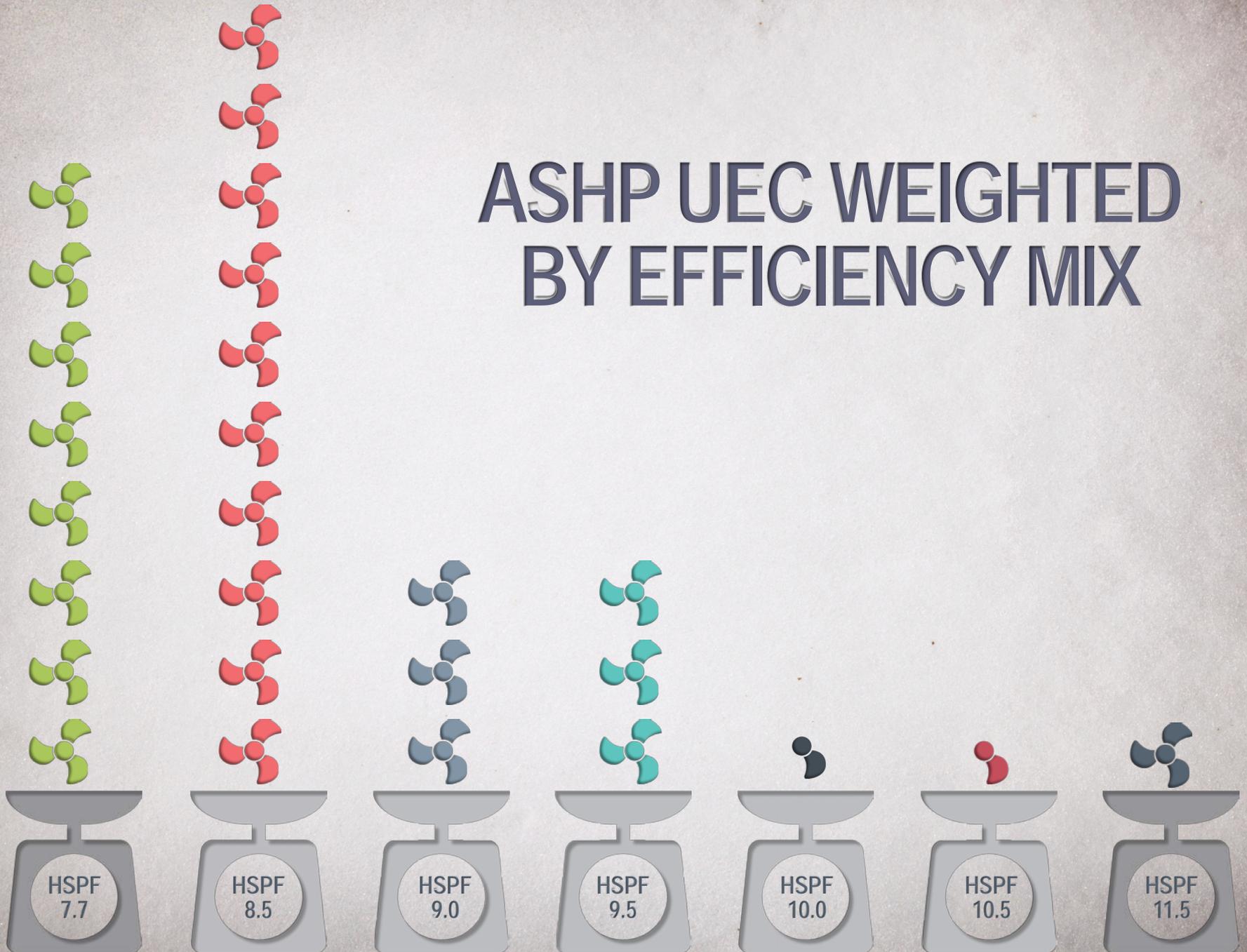


ASHP UNIT ENERGY CONSUMPTION





ASHP UEC WEIGHTED BY EFFICIENCY MIX



ASHP UEC WEIGHTED BY EFFICIENCY MIX

7,835
kWh/year





TAKEAWAYS

1. THERE ARE MANY EFFICIENCY LEVELS IN THE MARKET, AND THEY'RE ALL PART OF THE MARKET AVERAGE
2. EACH EFFICIENCY LEVEL HAS ITS OWN UEC
3. WE WEIGHT EACH UEC BY SALES DATA TO GET OVERALL AVERAGE UEC



SALES DATA



DISTRIBUTOR SALES DATA

DISTRIBUTOR TYPES



Maintenance
Repair & Operations

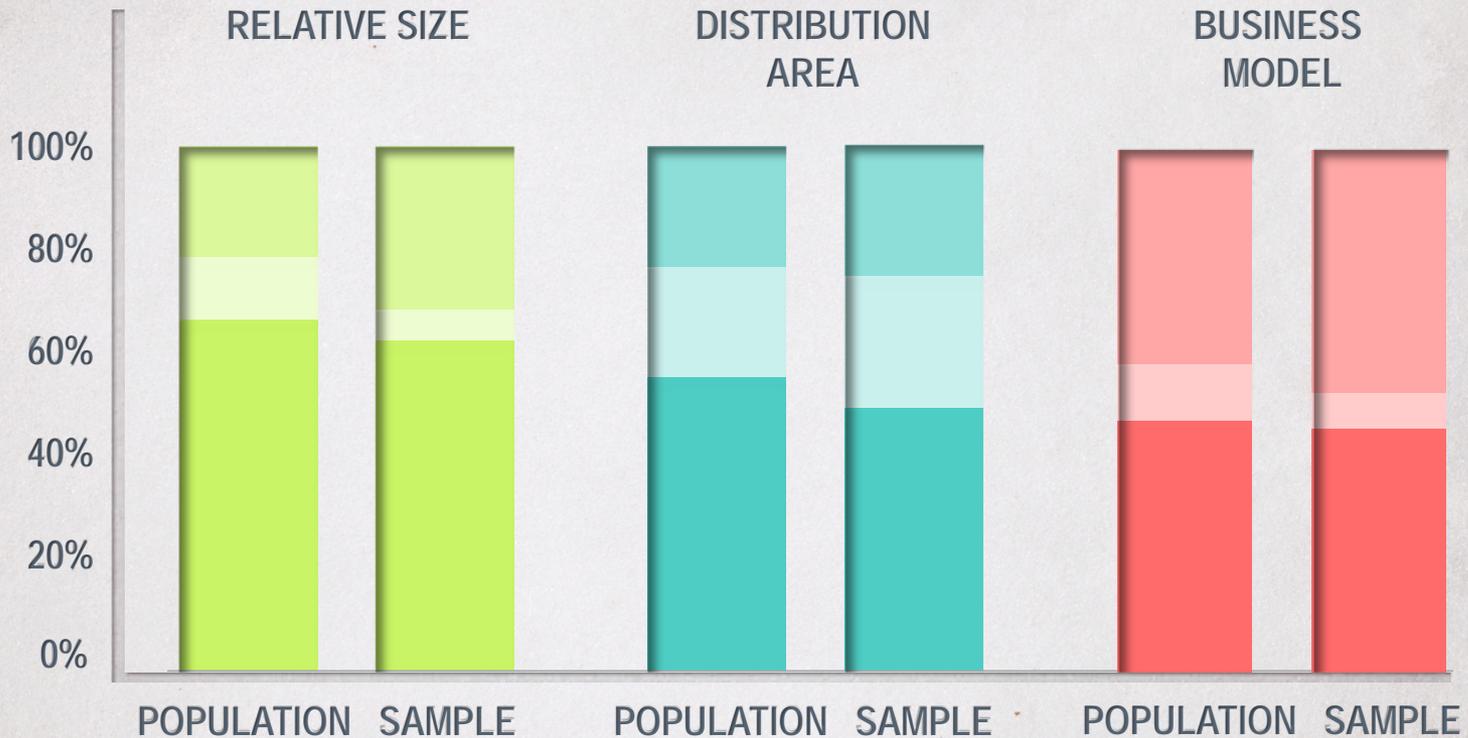


Full Line



Lighting Only

SURVEY REPRESENTATION

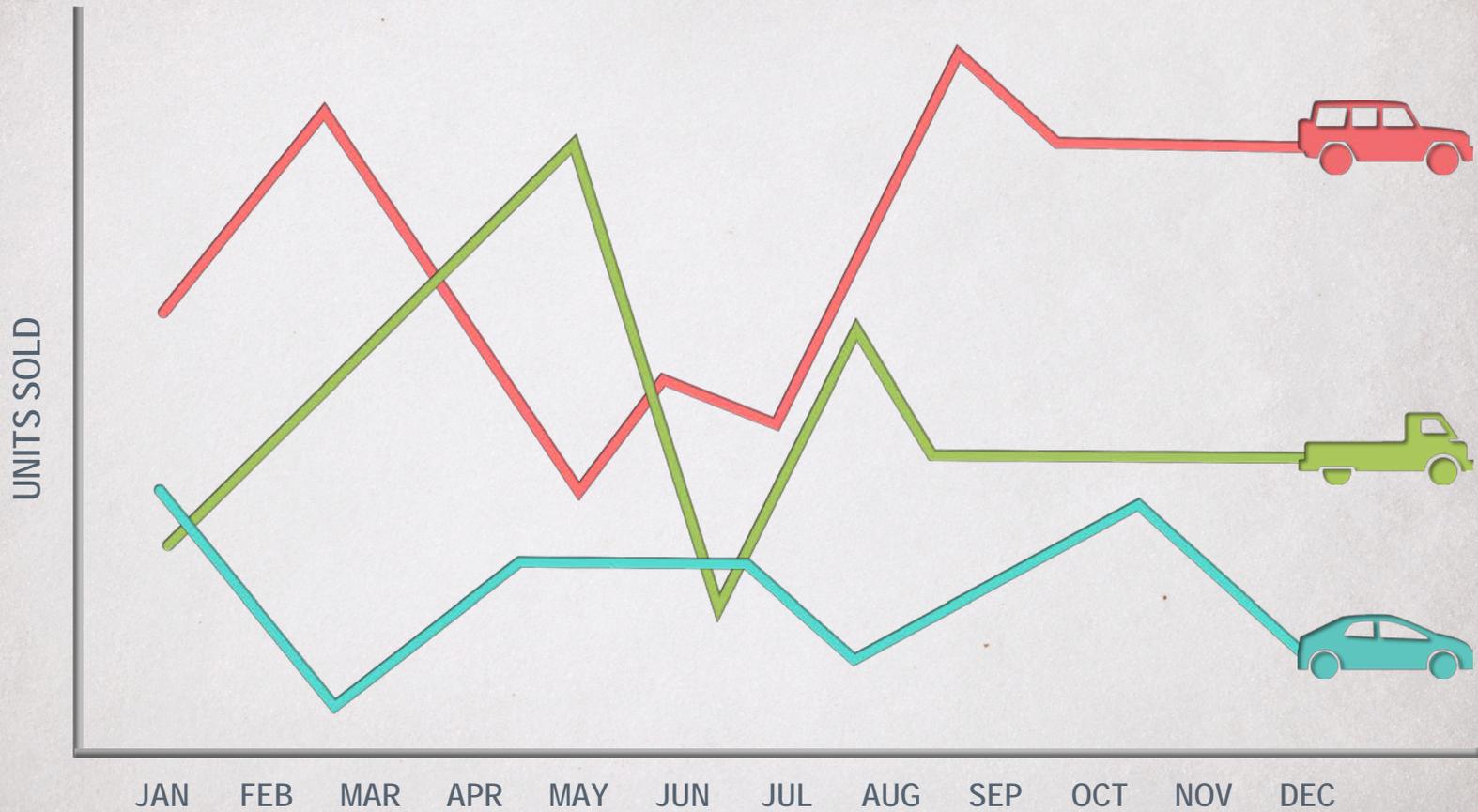


■ SMALL DISTRIBUTOR
■ MEDIUM DISTRIBUTOR
■ LARGE DISTRIBUTOR

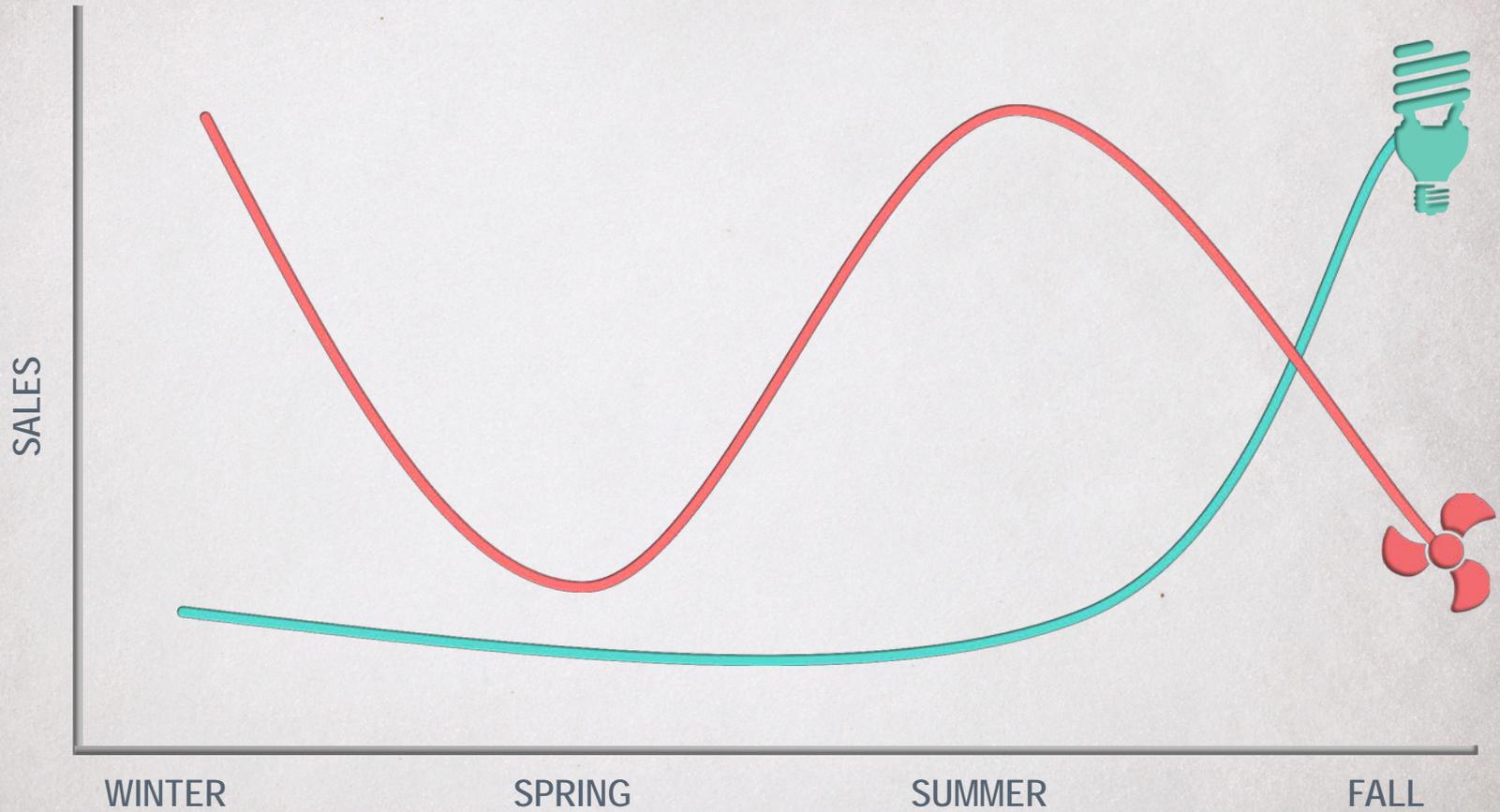
■ LOCAL
■ REGIONAL
■ NATIONAL

■ FULL LINE
■ MRO
■ LIGHTING ONLY

SALES IN THE BASELINE YEAR



SEASONALITY AND SALES



Not to scale



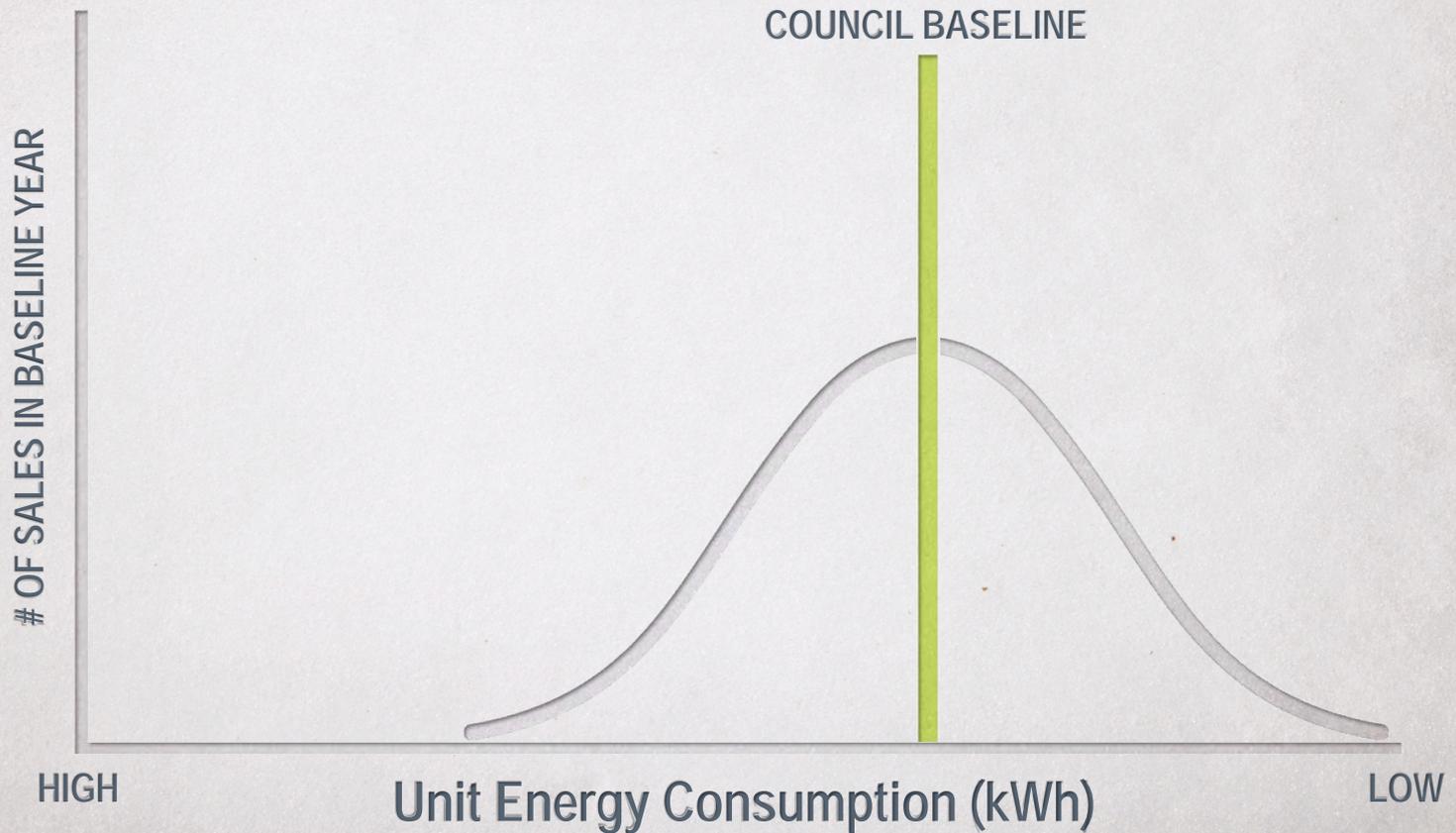
TAKE-AWAYS

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2. SALES DATA CAN BE REPRESENTATIVE, EVEN WHEN INCOMPLETE
3. WE CAN USE MARKET SEGMENTATION TO INFORM WHETHER OR NOT OUR SALES DATA IS REPRESENTATIVE
4. WE CAN ACCOUNT FOR SEASONAL VARIATIONS BY ESTABLISHING AVERAGE EFFICIENCIES USING FULL YEAR DATA



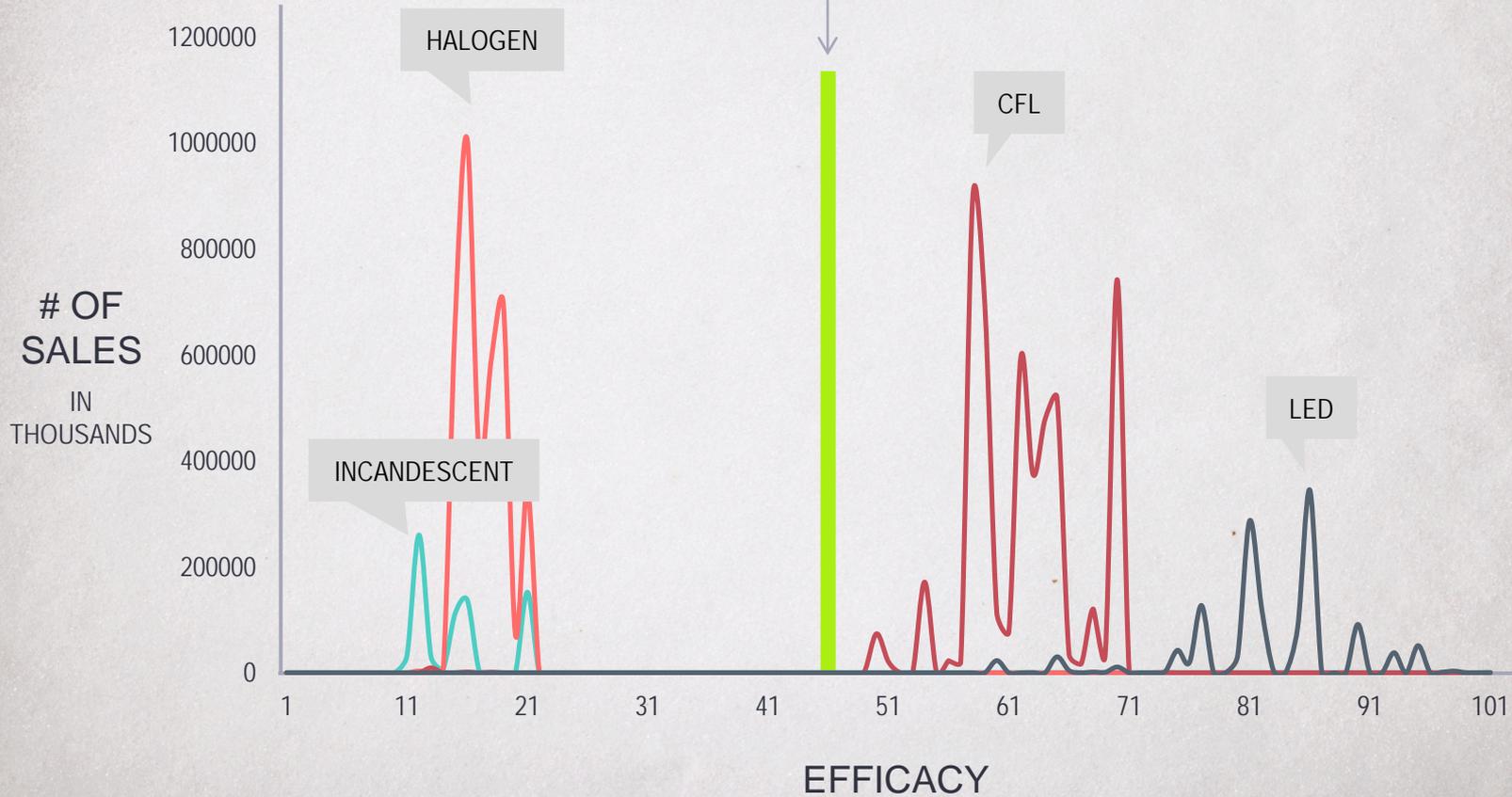
THE BASELINE

AVERAGE UEC IN THE BASELINE YEAR



CURRENT PRACTICE BASELINE

COUNCIL BASELINE
=
MARKET AVERAGE



General Purpose Lamps, 665-1439 lumens

FROZEN

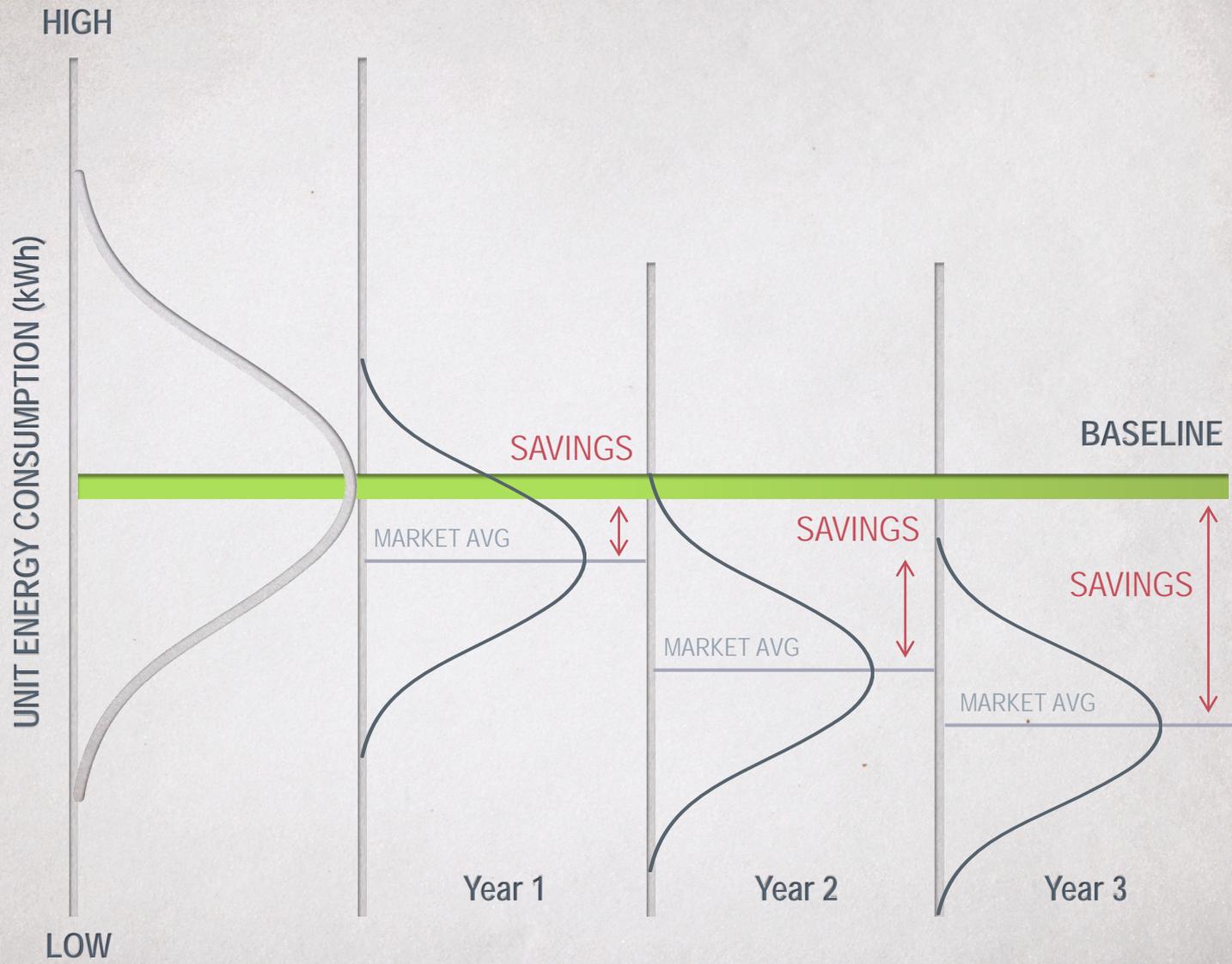
EFFICIENCY

TAKE-AWAYS

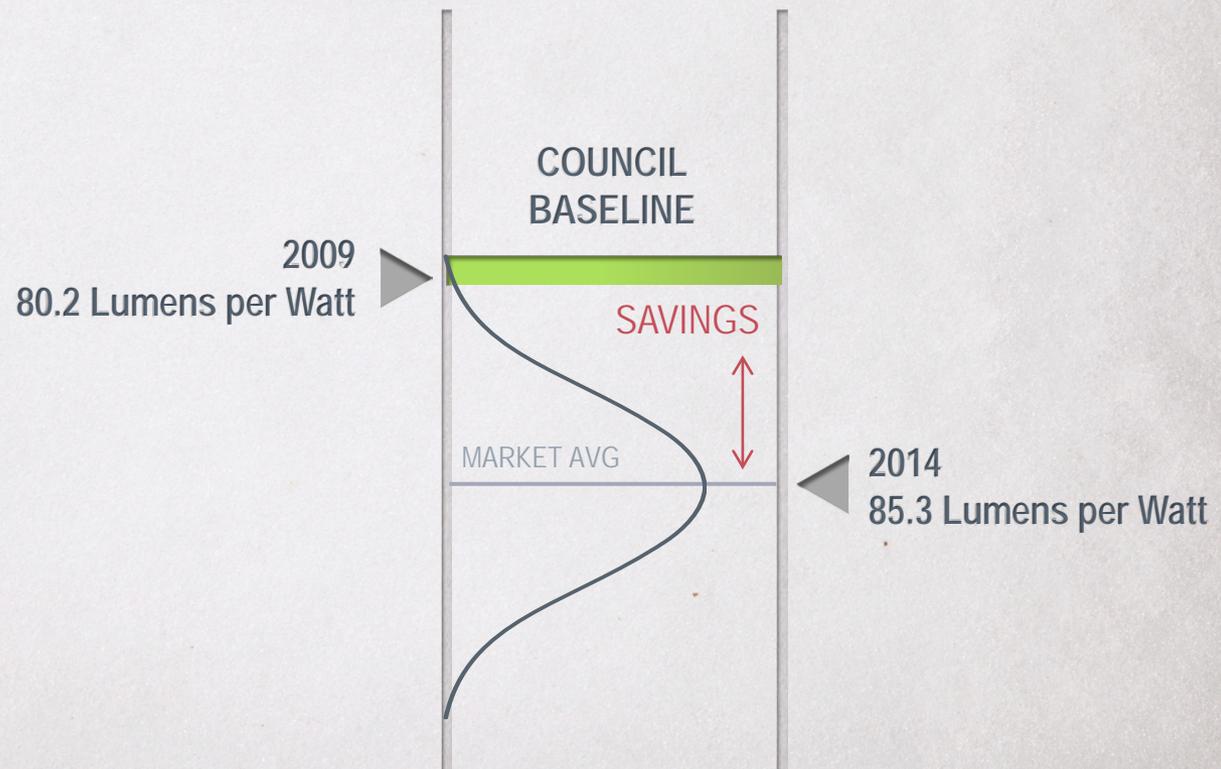
1. CURRENT PRACTICE \equiv FLOW
2. CURRENT PRACTICE \equiv MARKET AVERAGE
3. BASELINE EFFICIENCY MIX IS FROZEN



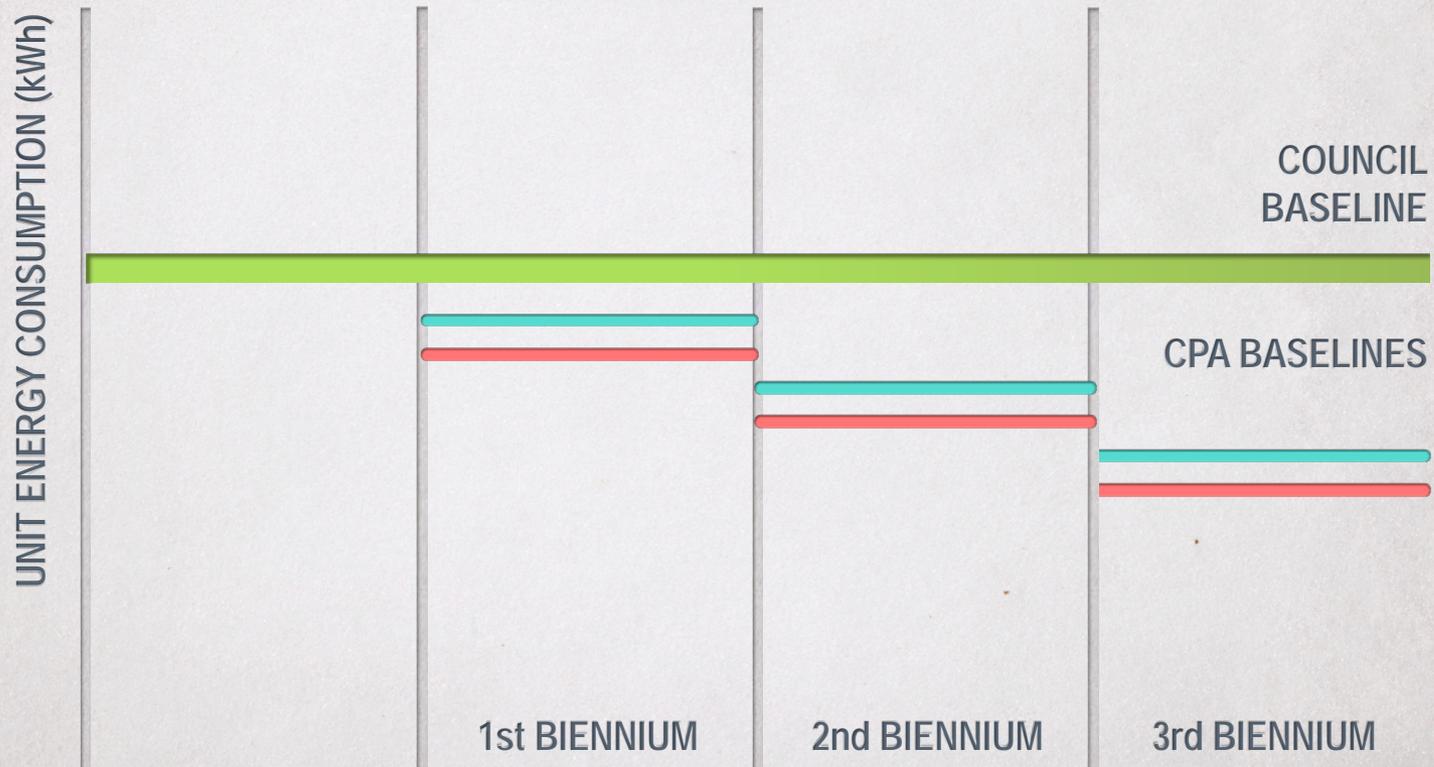
THE ACTUAL

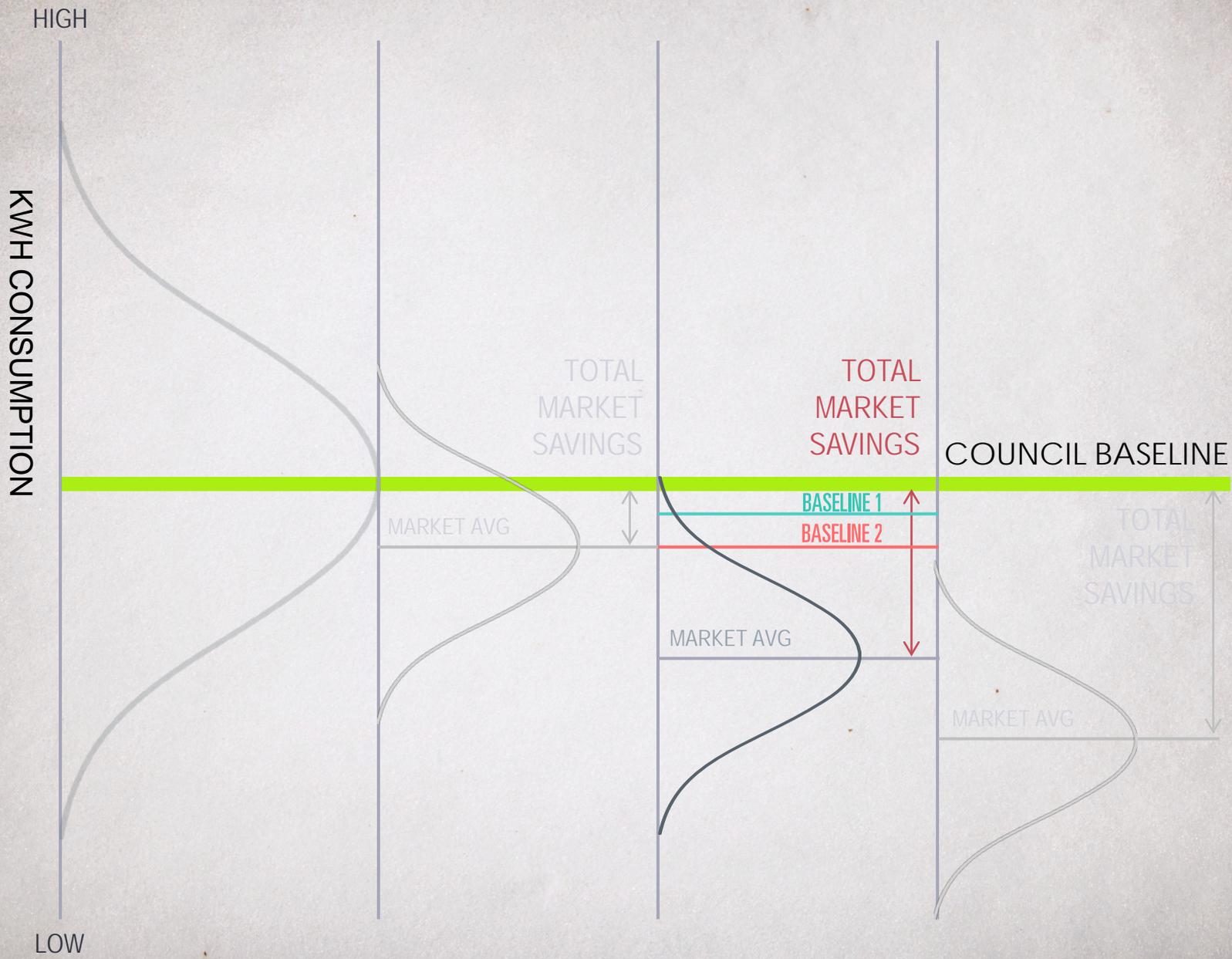


LINEAR FLUORESCENT LAMP EXAMPLE



BASELINES CHANGE THE ANALYSIS



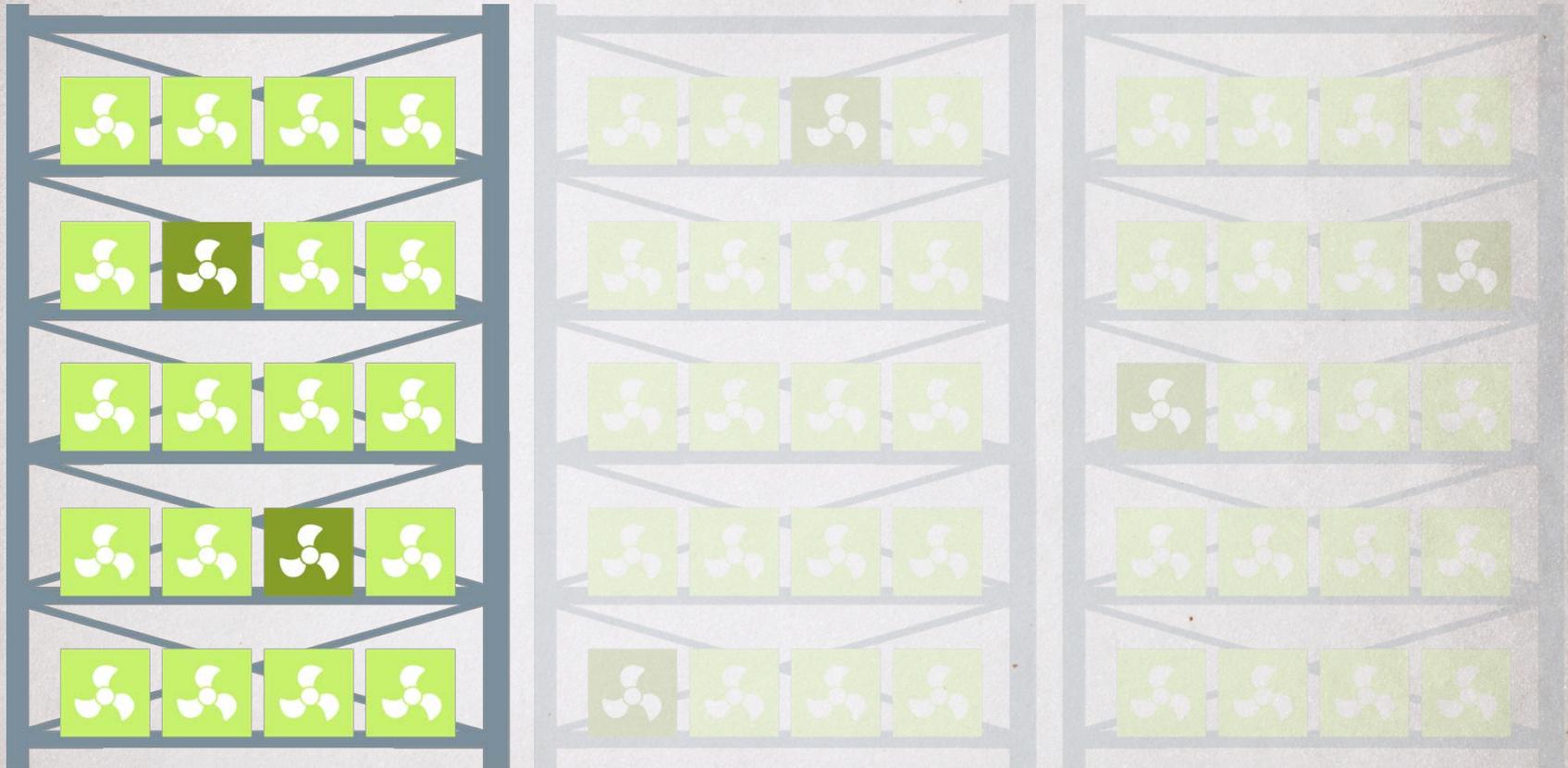


TAKE-AWAYS

1. THE ACTUAL AND THE BASELINE ARE THE SAME ANALYSIS, AT DIFFERENT POINTS IN TIME
2. MOMENTUM SAVINGS MEASURES THE CHANGE IN THE TOTAL MARKET, NOT DISCRETE WIDGETS
3. BASELINE INCONSISTENCY CREATES INACCURACY IN REPORTING

EFFICIENCY IN THE BASELINE

TOTAL SALES MIX

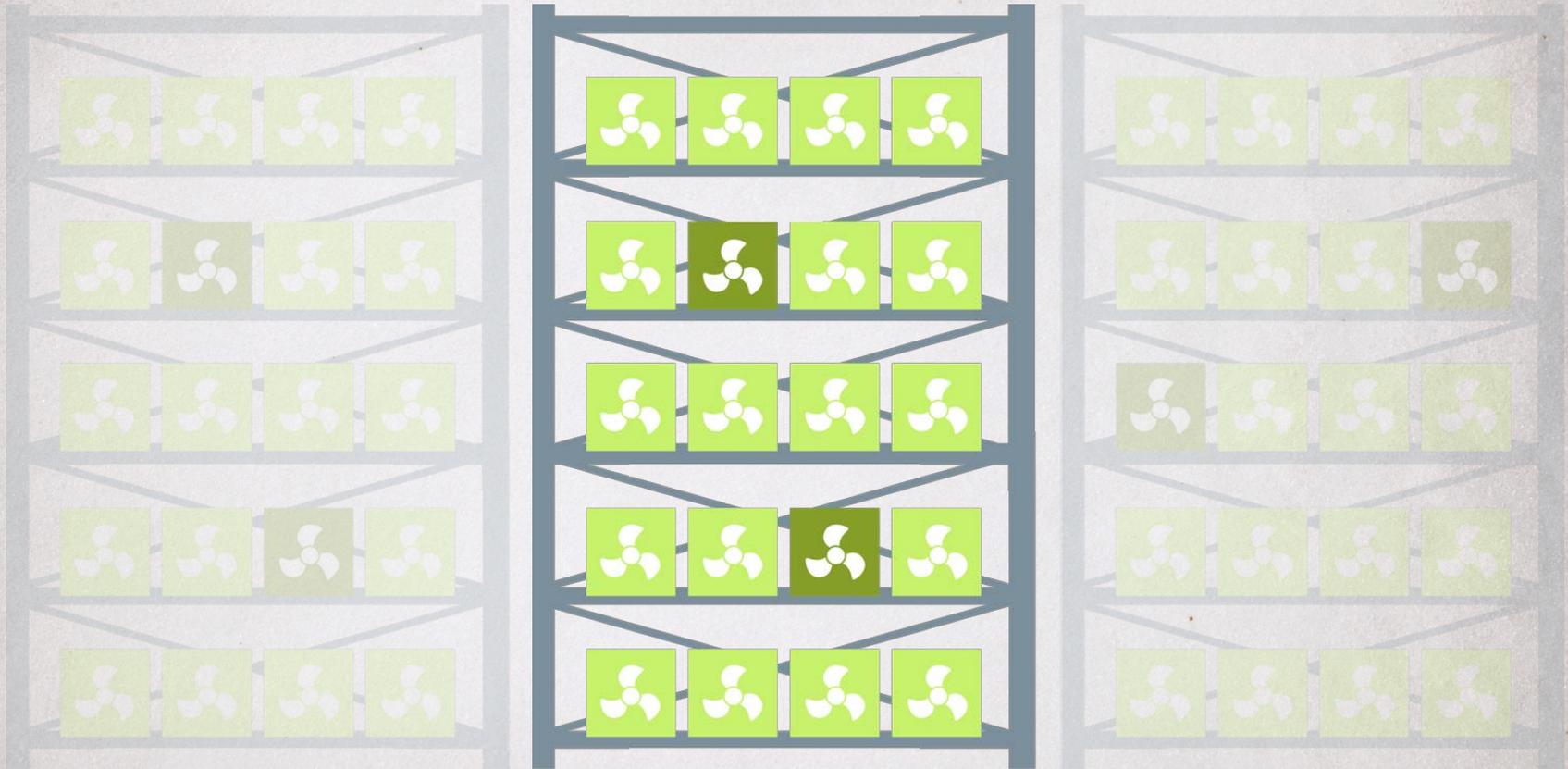


YEAR ONE

YEAR TWO

YEAR THREE

TOTAL SALES MIX

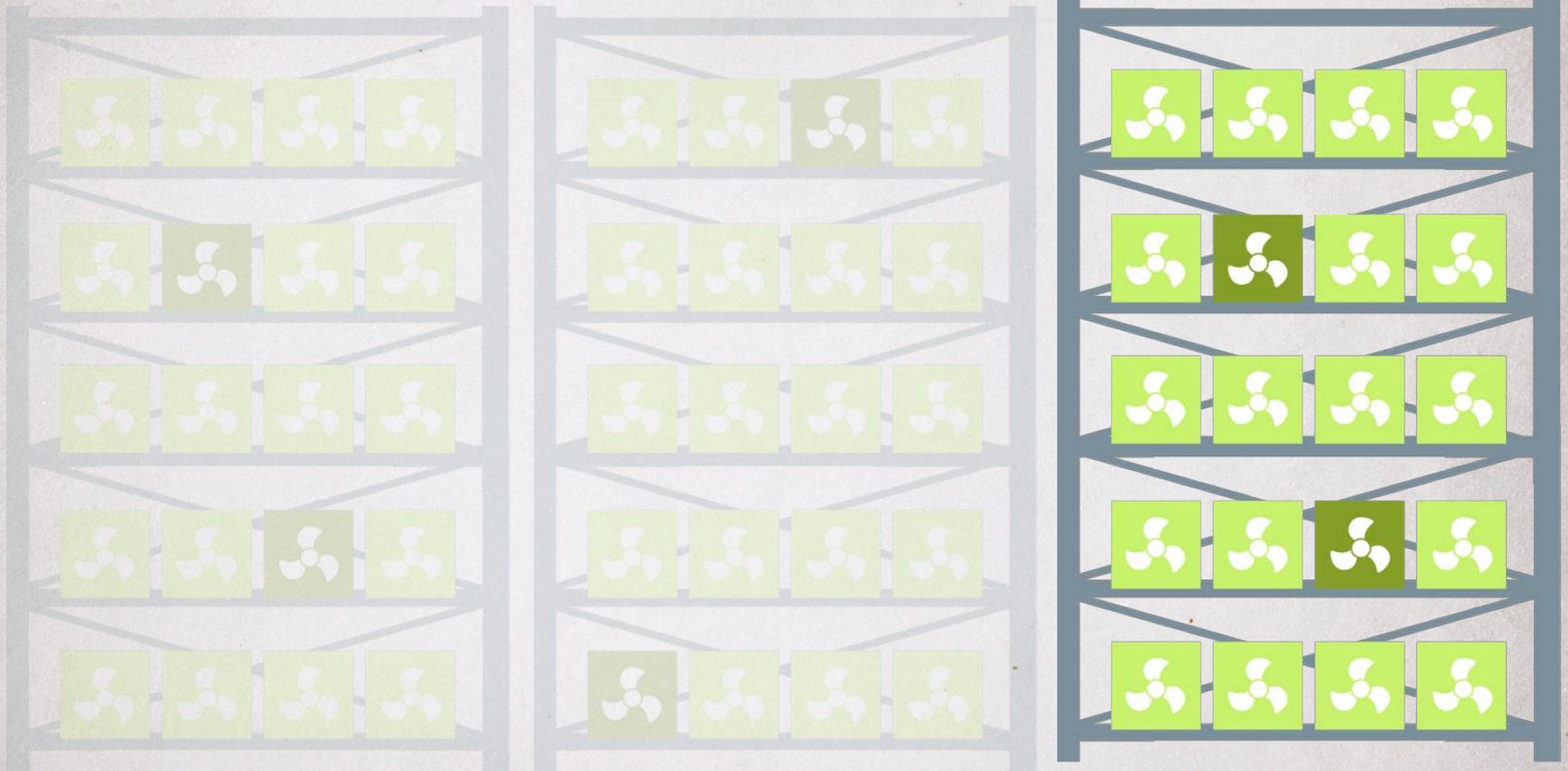


YEAR ONE

YEAR TWO

YEAR THREE

TOTAL SALES MIX

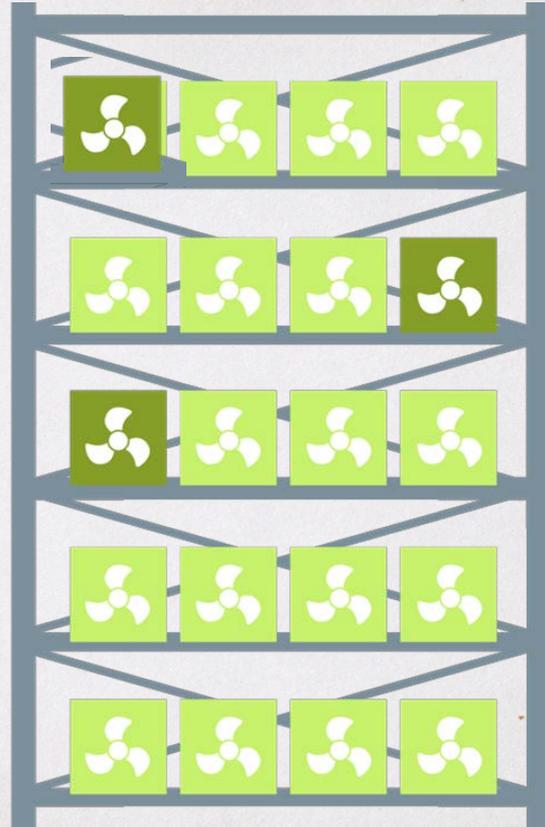


YEAR ONE

YEAR TWO

YEAR THREE

TOTAL SALES MIX



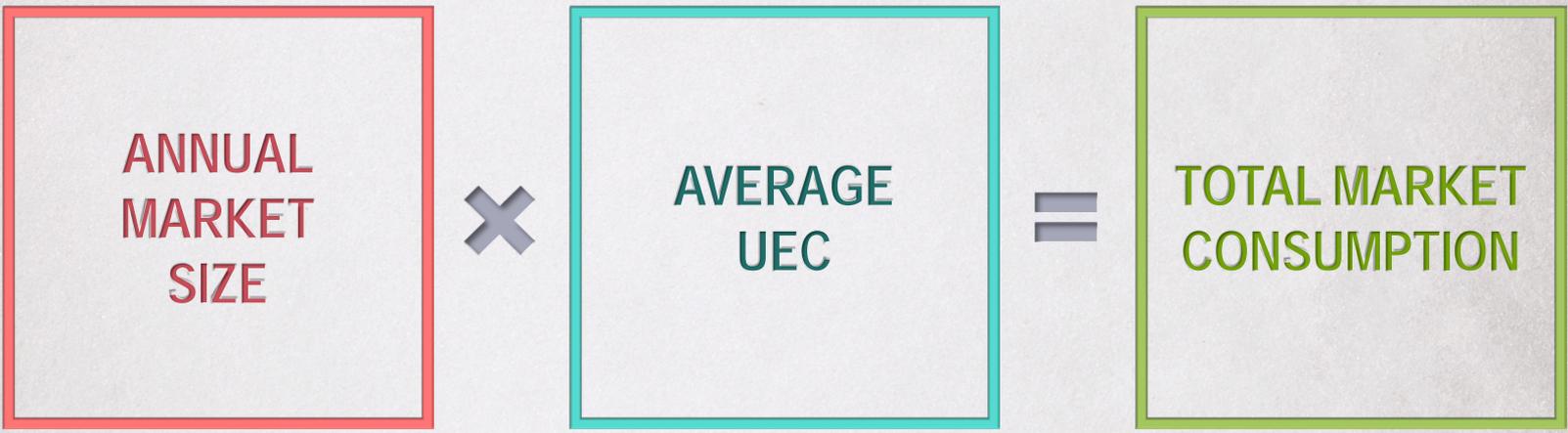
YEAR FOUR

TAKE-AWAYS

1. FROZEN EFFICIENCY ASSUMES THAT THE EFFICIENCY AT THE TIME OF THE PLAN CONTINUES: NO INCREMENTAL SAVING UNLESS THE MARKET CHANGES

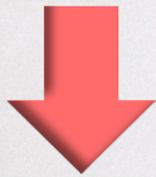


ANNUAL MARKET SIZE



HOW BIG IS THE REGIONAL MARKET?

THREE APPROACHES



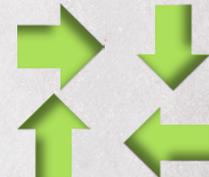
Top-Down

Scaling down national shipment data to the represent the PNW



Bottom-Up

Scaling up sales data from a subset of regional data



Stock-Turnover

Estimating annual sales using installed stock data and assumed lifetime

TOP-DOWN APPROACH



1 BILLION LAMPS

Estimated 2014 National Shipments

4.3 PERCENT

PNW as % of National Population

92 PERCENT

Retail Lamps Purchased by Residential Customers

39.5 MILLION LAMPS

Top down estimate of 2014 PNW residential lamp market

BOTTOM-UP APPROACH



16.4 MILLION LAMPS

2014 Nielsen Sales Data for PNW

31 PERCENT

% of Total PNW Sales Captured by Nielsen

92 PERCENT

Retail Lamps Purchased by Residential Customers

48.5 MILLION LAMPS

Bottom-up Estimate of 2014 PNW residential lamp market

COMPARISON



Top-Down

39.5 million

Estimated 2014 PNW Shipments



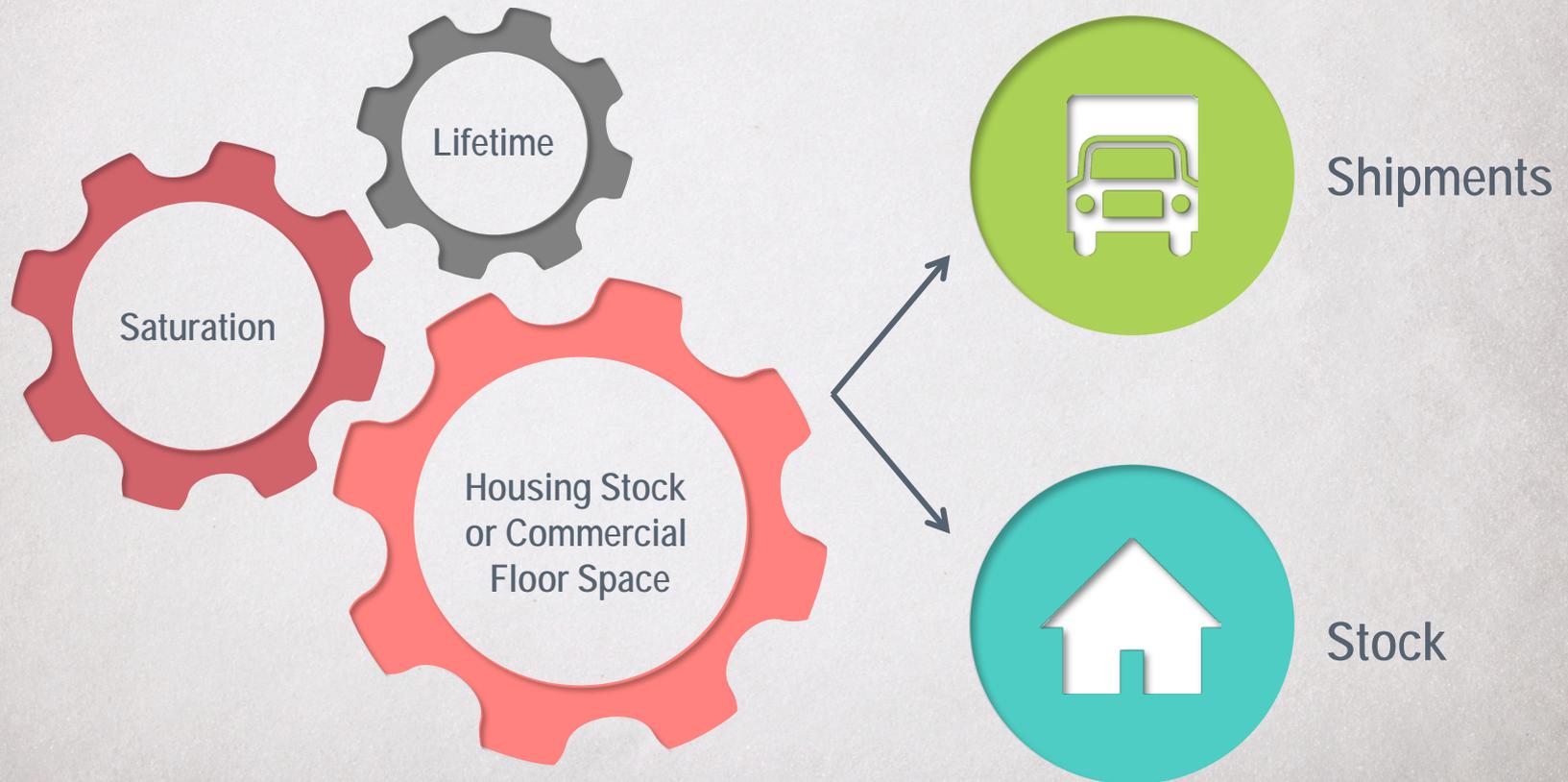
Bottom-Up

48.5 million

Estimated 2014 PNW Sales

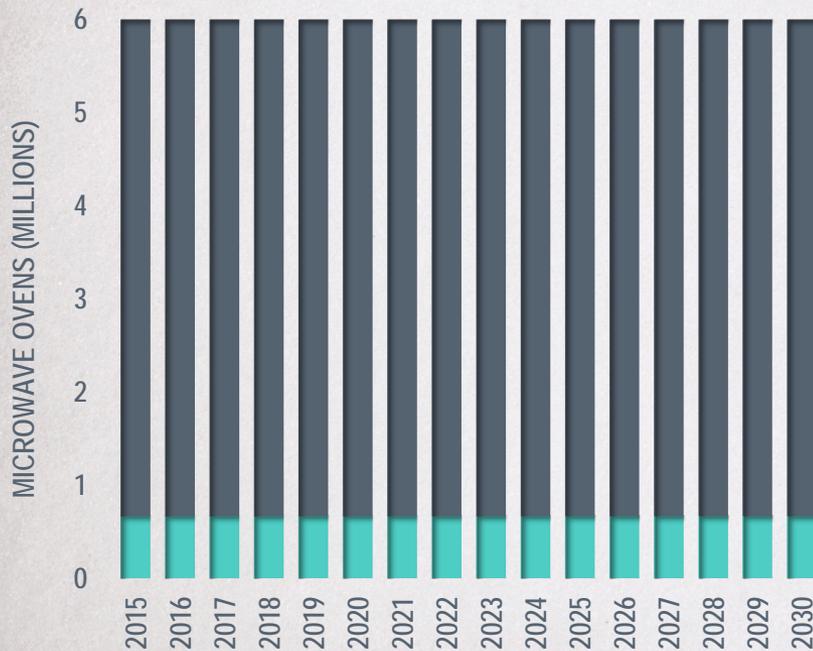
Market Size:
~ 44 million general purpose lamps

STOCK TURNOVER MODEL OVERVIEW



EXAMPLE: MICROWAVES

REPLACEMENTS SHIPMENTS IN EXISTING STOCK



■ Replacements ■ Rest of Installed Stock

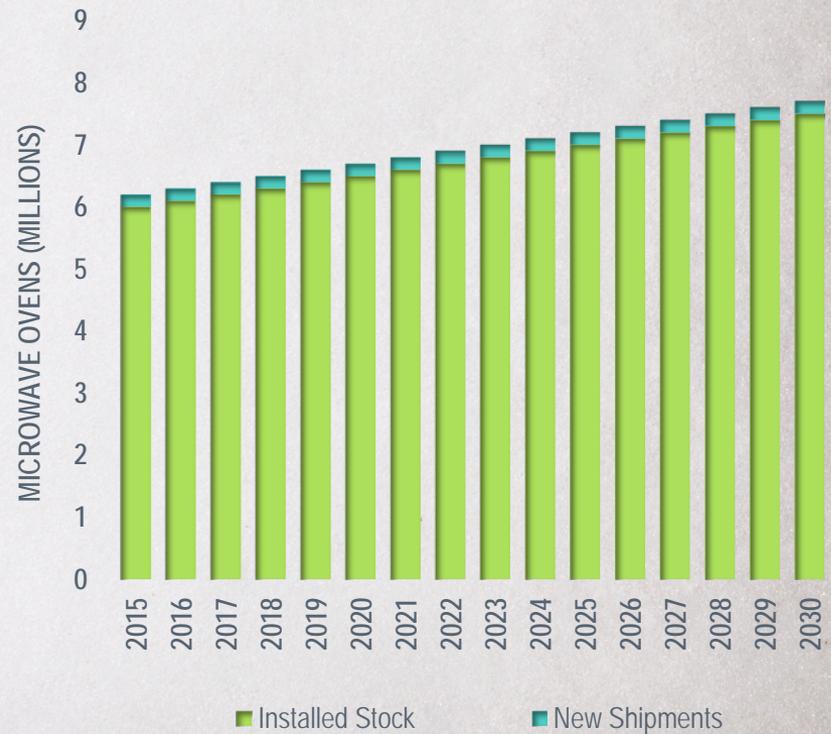
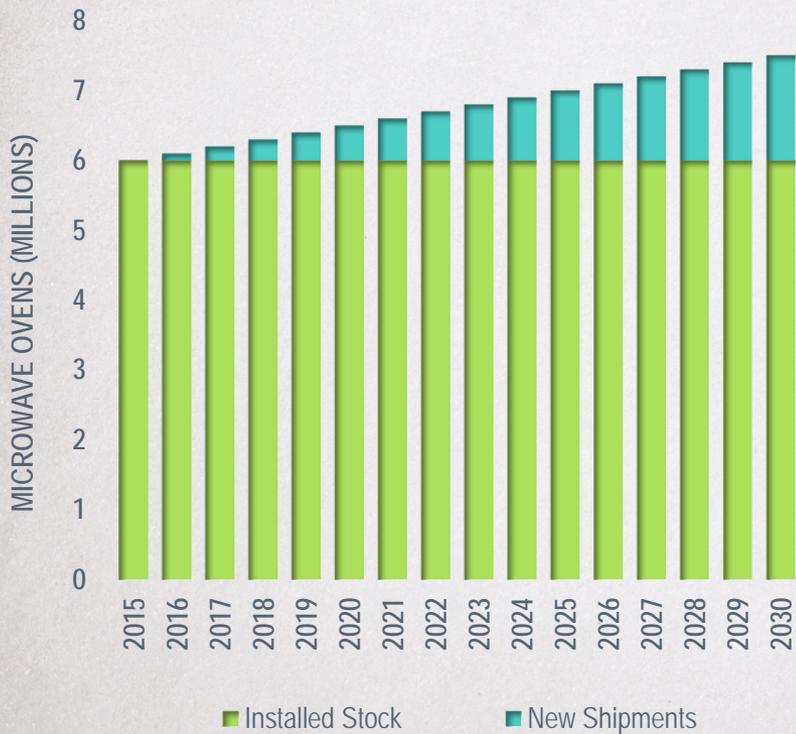


■ Accumulated Replacements ■ Rest of Installed Stock

SAVINGS FROM EXISTING STOCK FOLLOWING STANDARDS



NEW SHIPMENTS AND STOCK GROWTH



INCREMENTAL SAVINGS FROM NEW SHIPMENTS



INCREMENTAL SAVINGS FOLLOWING STANDARDS





TAKE-AWAYS

1. BPA USES THREE APPROACHES TO DEVELOP THE BEST POSSIBLE MARKET SIZE ESTIMATE
2. SAVINGS FROM STANDARDS ONLY CONTINUE UNTIL THE STOCK IS TURNED OVER

LOCAL VARIATION



IN A BIG-BOX WORLD: MORE SIMILARITIES THAN DIFFERENCES



RBSA DIFFERENCES

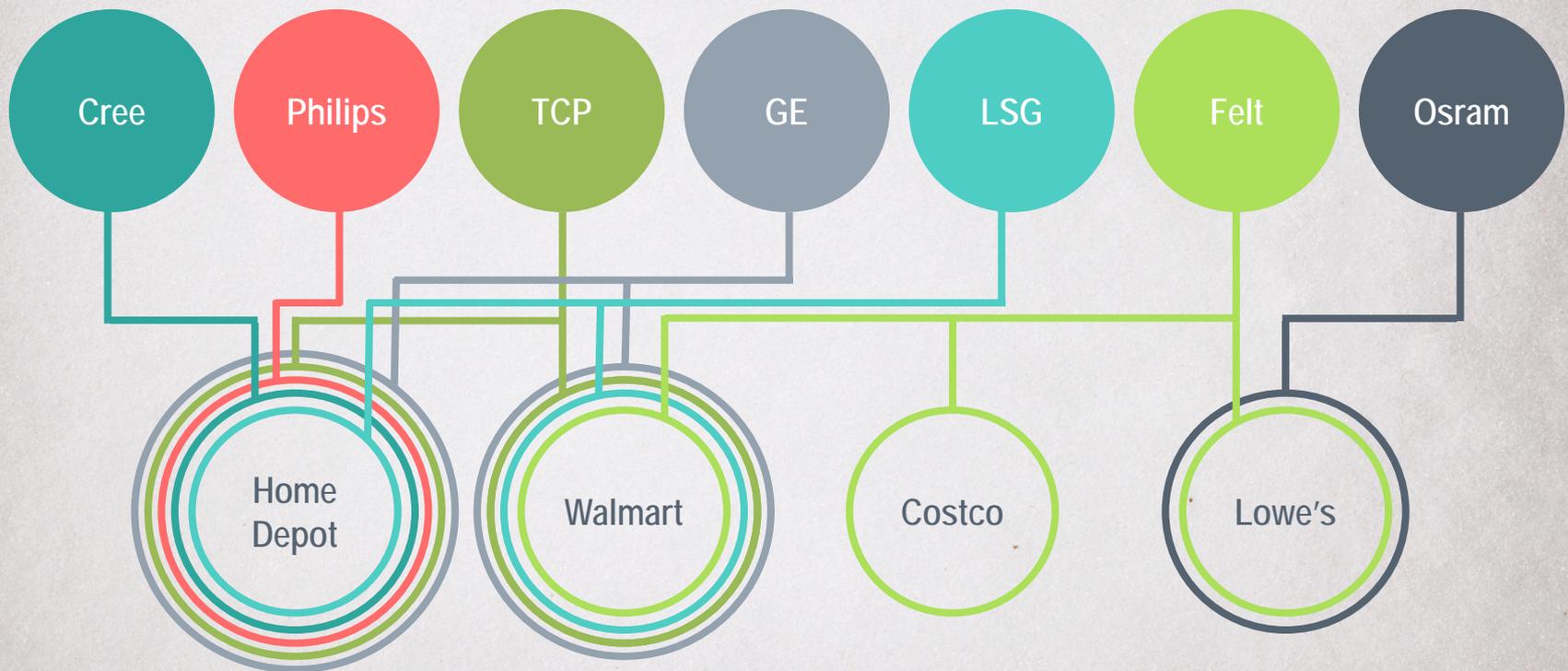


VINTAGE OF HOMES



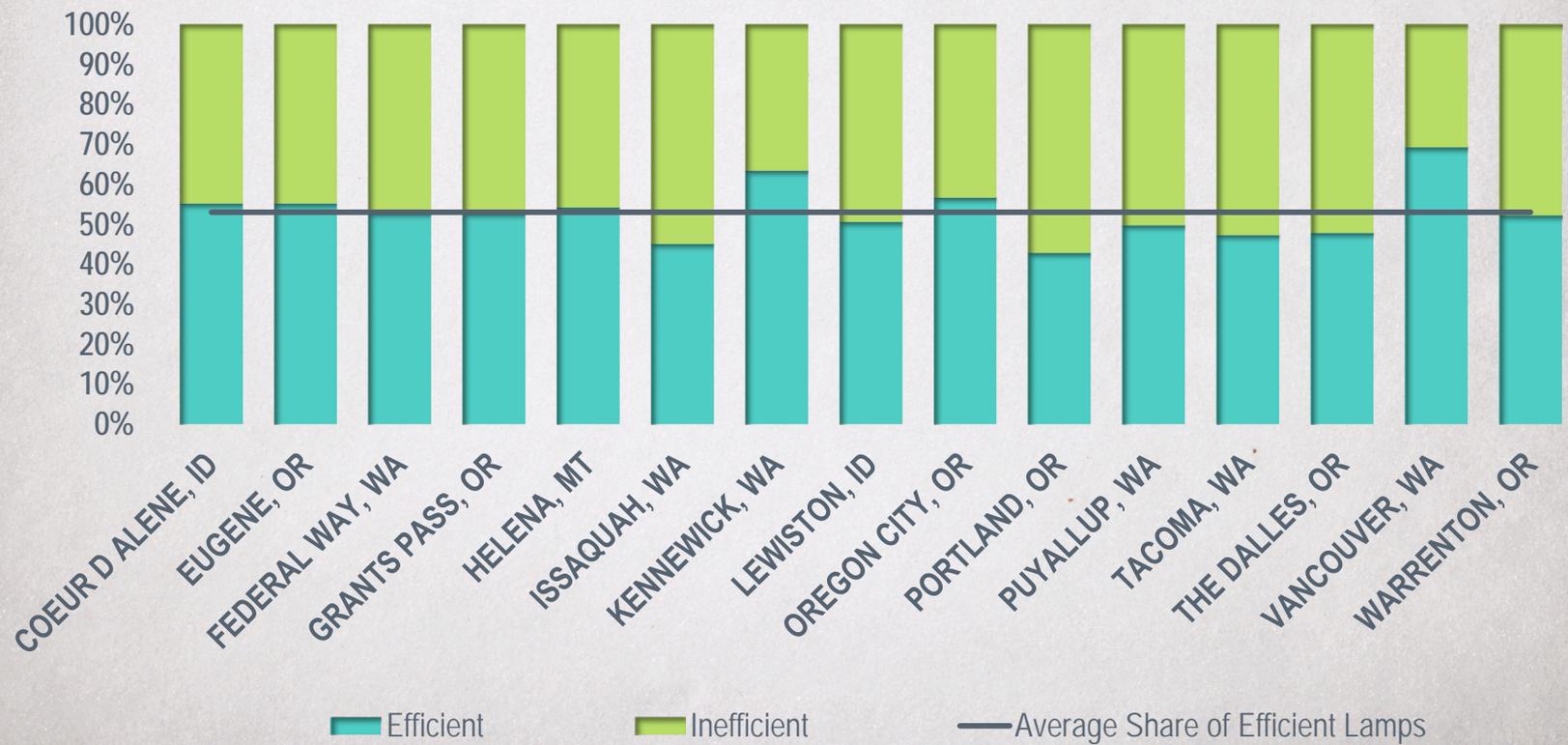
FUEL AVAILABILITY

FOUR RETAILERS DOMINATE RESIDENTIAL LIGHTING



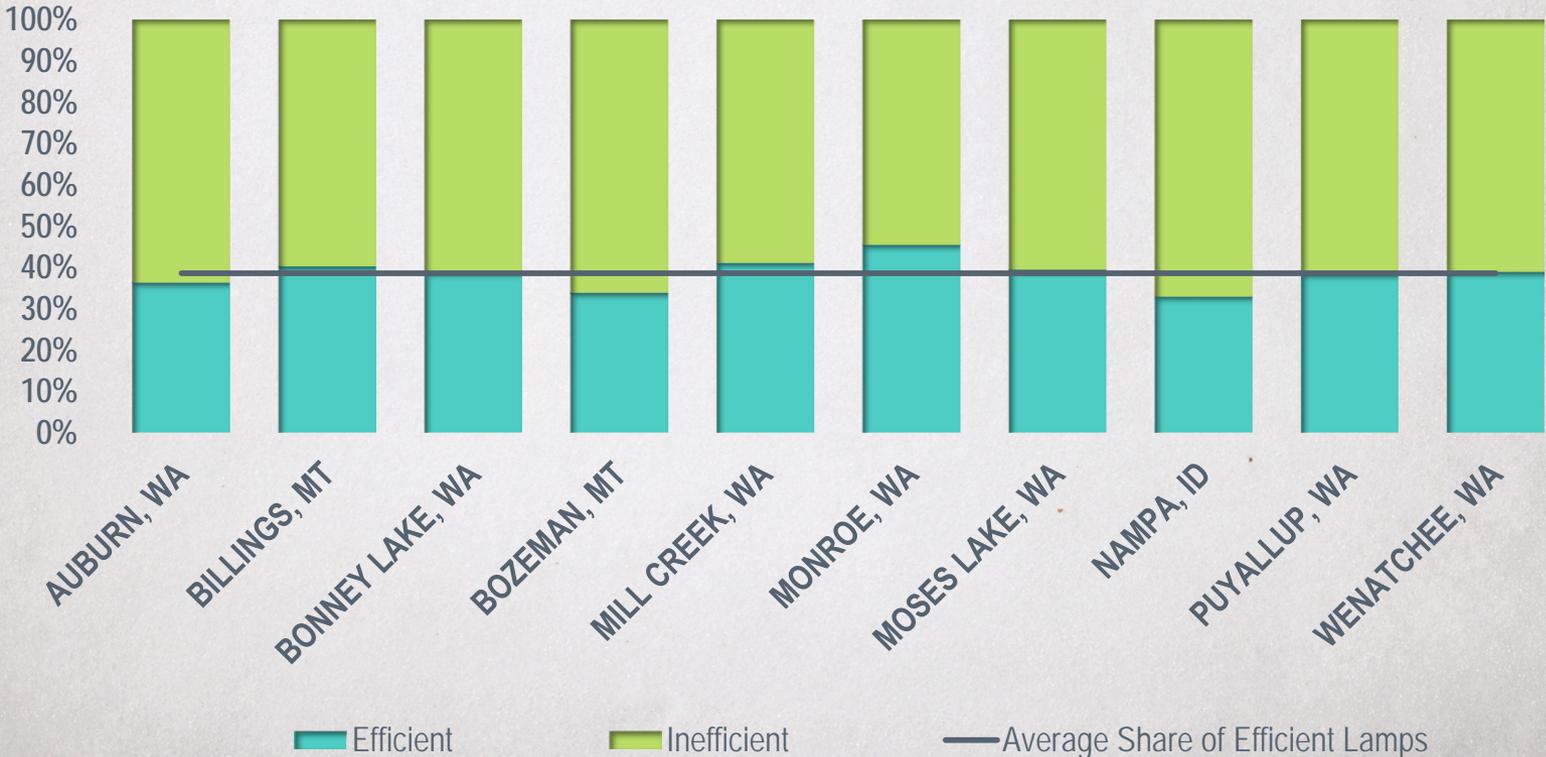
SHARE OF EFFICIENT LAMPS STOCKED BY STORE LOCATION

Home Depot



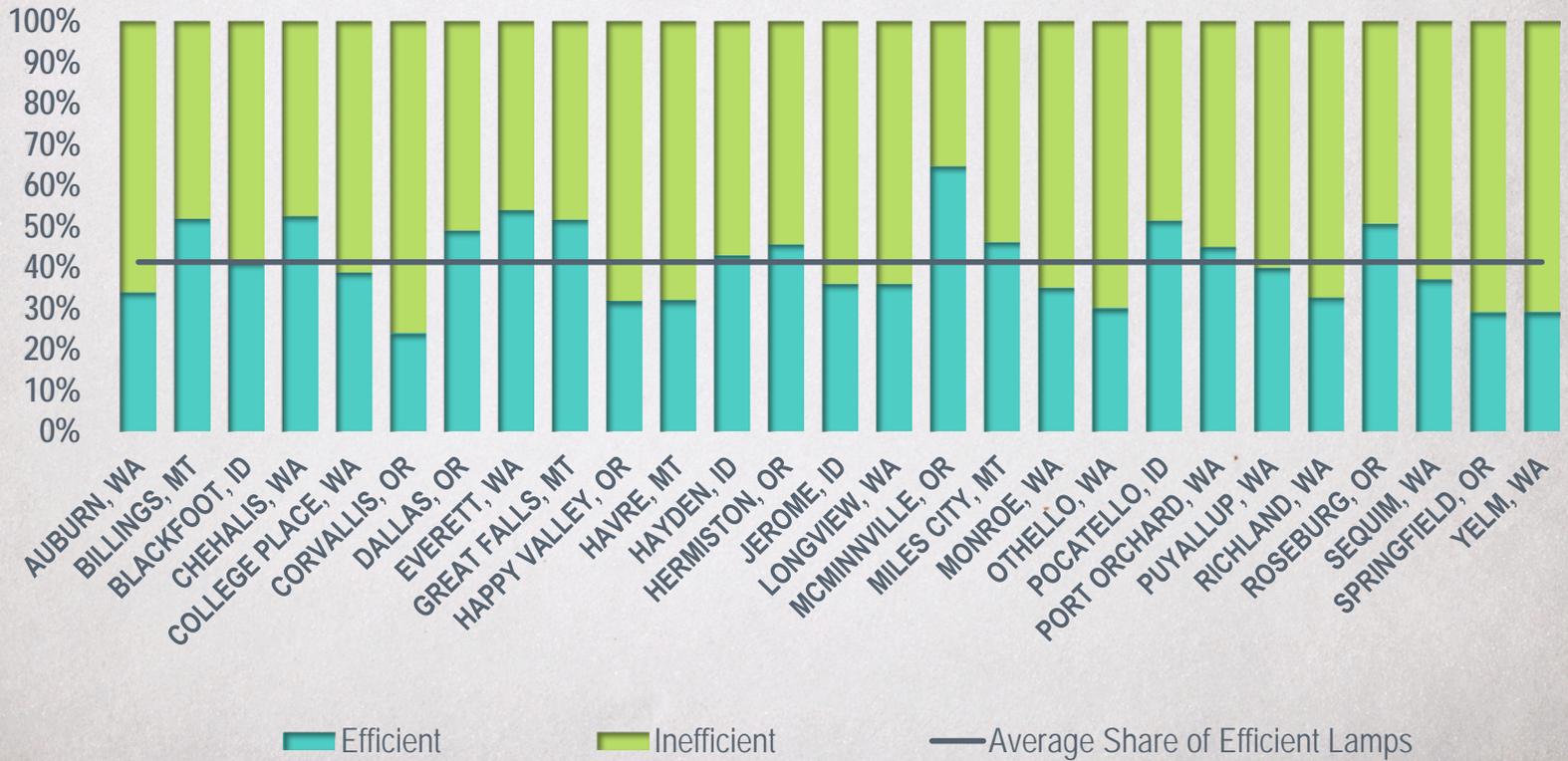
SHARE OF EFFICIENT LAMPS STOCKED BY STORE LOCATION

Lowe's

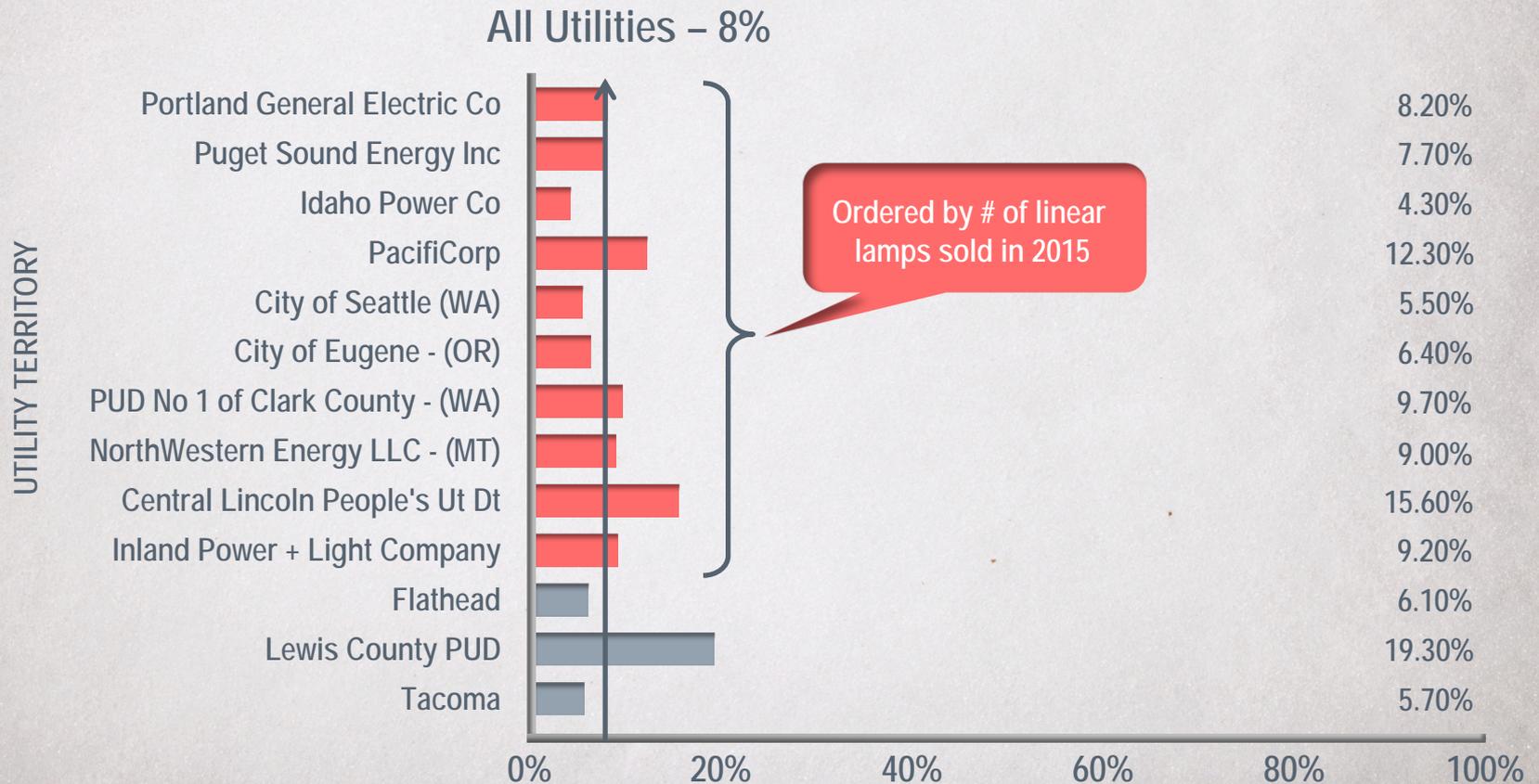


SHARE OF EFFICIENT LAMPS STOCKED BY STORE LOCATION

Walmart



T12s AS % OF ALL LINEAR LAMPS SOLD INTO TERRITORY



TAKE-AWAYS

1. THERE IS MORE CONSISTENCY THAN DIFFERENCES IN SUB-REGIONAL MARKETS
2. VINTAGE AND FUEL AVAILABILITY ARE DRIVERS OF DIFFERENCE
3. THE AVERAGE IS ONLY AN AVERAGE

RECAP

TAKE-AWAYS: STOCK AND FLOW

1. MOMENTUM SAVINGS OCCUR WHEN MARKETS CHANGE
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TAKE-AWAYS: EFFICIENCY MIX

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TAKE-AWAYS: BASELINE

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TAKE-AWAYS: ACTUAL MARKET

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TAKE-AWAYS: EFFICIENCY IN THE BASELINE

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TAKE-AWAYS: MARKET SIZE

1. WE USE THREE APPROACHES TO DEVELOP THE BEST POSSIBLE MARKET SIZE ESTIMATE
2. SAVINGS ONLY CONTINUE UNTIL THE STOCK IS TURNED OVER

TAKE-AWAYS: LOCAL VARIATION

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