



Seattle City Light

# 2018 INTEGRATED RESOURCE PLAN

Stakeholder meeting

Seattle City Light | August 1, 2017

## SAFETY MOMENT

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
 Sunny	 Sunny	 Sunny	 Sunny	 Sunny	 Mostly Sunny	 Mostly Sunny
85° 59°	89° 62°	92° 67°	98° 68°	97° 61°	89° 64°	85° 63°
0%	0%	0%	0%	0%	0%	0%

### 7-DAY FORECAST FOR SEATTLE AREA JULY 31 ST - AUGUST 4TH

- <http://murray.seattle.gov/seattle-cooling-shelter-locations-announced-ahead-of-heat-wave/>
- <http://www.kingcounty.gov/depts/health/emergency-preparedness/preparing-yourself/hot-weather.aspx>

## AGENDA

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- Introductions
- Integrated Resource Plan outlook
- City Light's resource portfolio
- Inputs, assumptions & scenarios
- IRP next steps
- Break
- Load forecast
- Conservation potential update

## HOW WILL WE REASSESS THE IRP STRATEGY?

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These are questions we answer in an IRP

### ✓ **What do we have? (resources and contracts)**

- How much do we need and when? (to meet peak demand and renewable portfolio standards)
- How can we fill that need? (portfolio options)
- Which options are robust? (scenario testing)
- Where's the best value? (cost, risk, and environmentally responsible)

## IRP OUTLOOK AND KNOWN LEGISLATION

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- ✓ Natural gas price outlooks remain low (forecast)
- ✓ Federal wind and solar tax credit extensions and continued state incentives mean more cost savings for near-term investment (current laws)
- ✓ California and Oregon increased renewable portfolio standards (current laws)

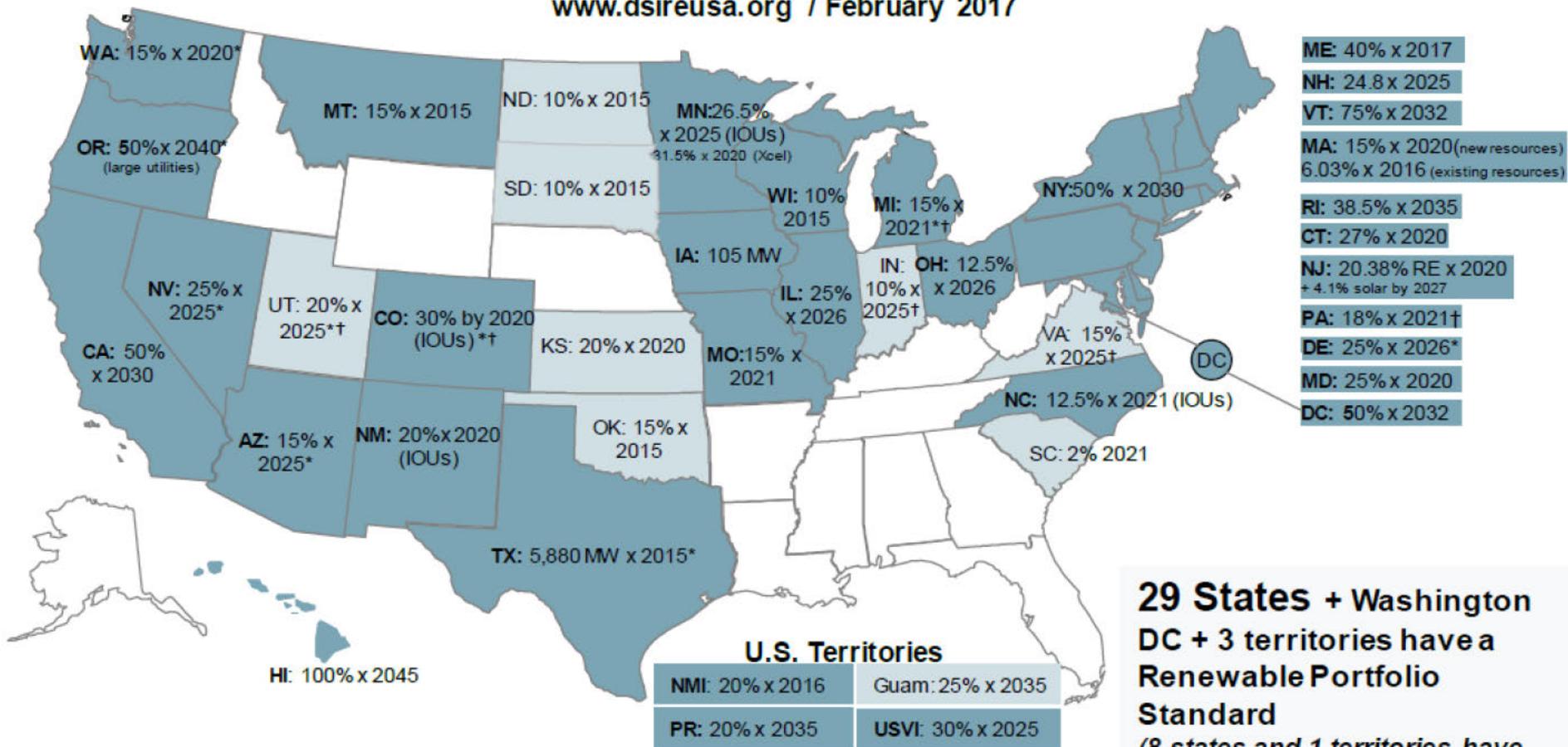
## LEGISLATIVE UNCERTAINTIES

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- ❑ New presidential administration rolling back former administration's environmental policies
- ❑ US withdrawing from Paris Climate agreement – with many businesses, states, and cities keeping their resolve to lead the way on Climate
- ❑ Washington state taking input on its Clean Air Rule and working with stakeholders on a state Clean Power Plan

# Renewable Portfolio Standard Policies

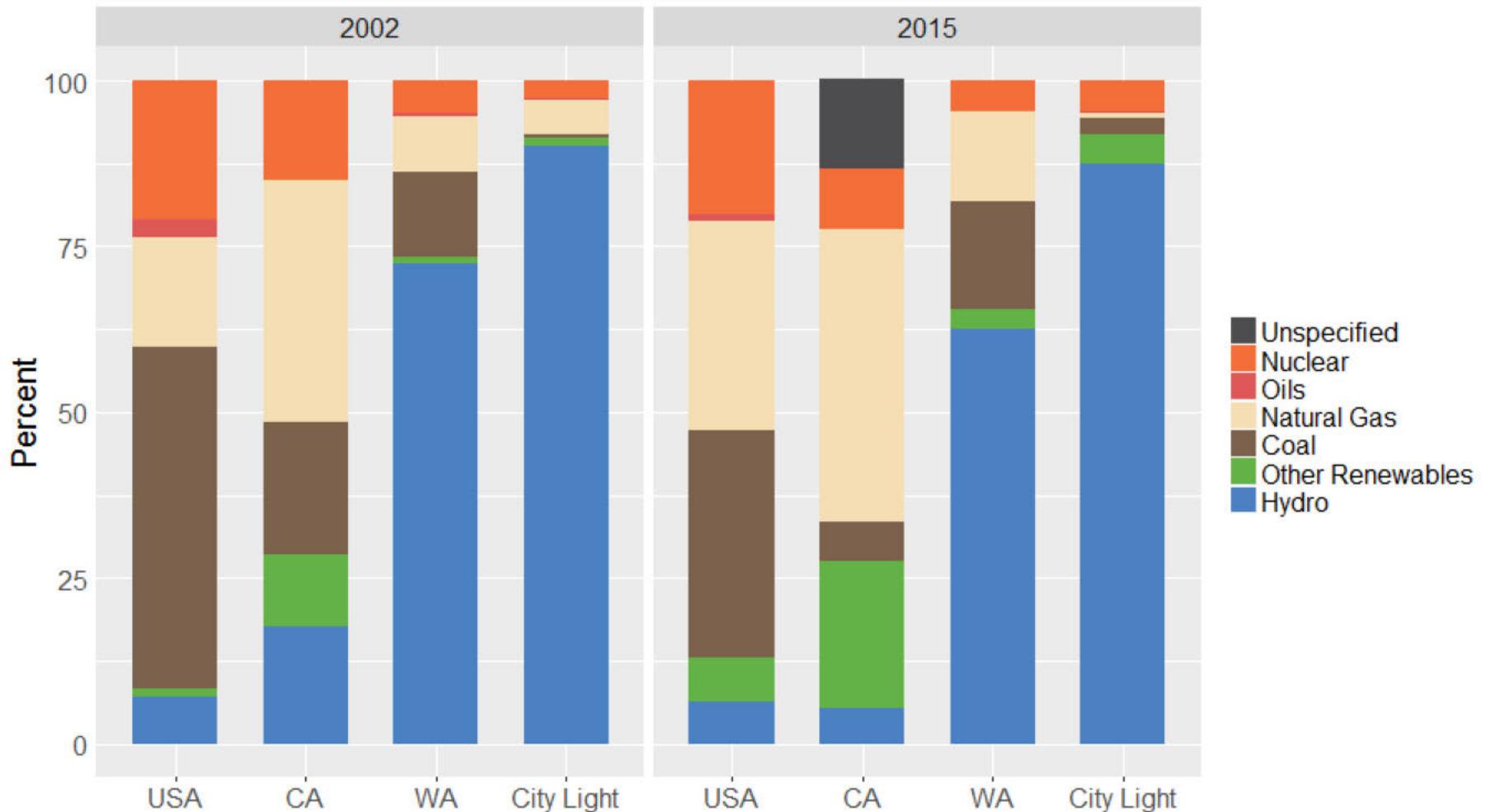
www.dsireusa.org / February 2017



**29 States + Washington DC + 3 territories have a Renewable Portfolio Standard**  
*(8 states and 1 territories have renewable portfolio goals)*

Renewable portfolio standard  
 Renewable portfolio goal  
\* Extra credit for solar or customer-sited renewables  
† Includes non-renewable alternative resources

# CHANGE IN ELECTRIC SECTOR FUEL MIX 2002 TO 2015



# CHANGE IN ELECTRIC SECTOR FUEL MIX

2002 TO 2015

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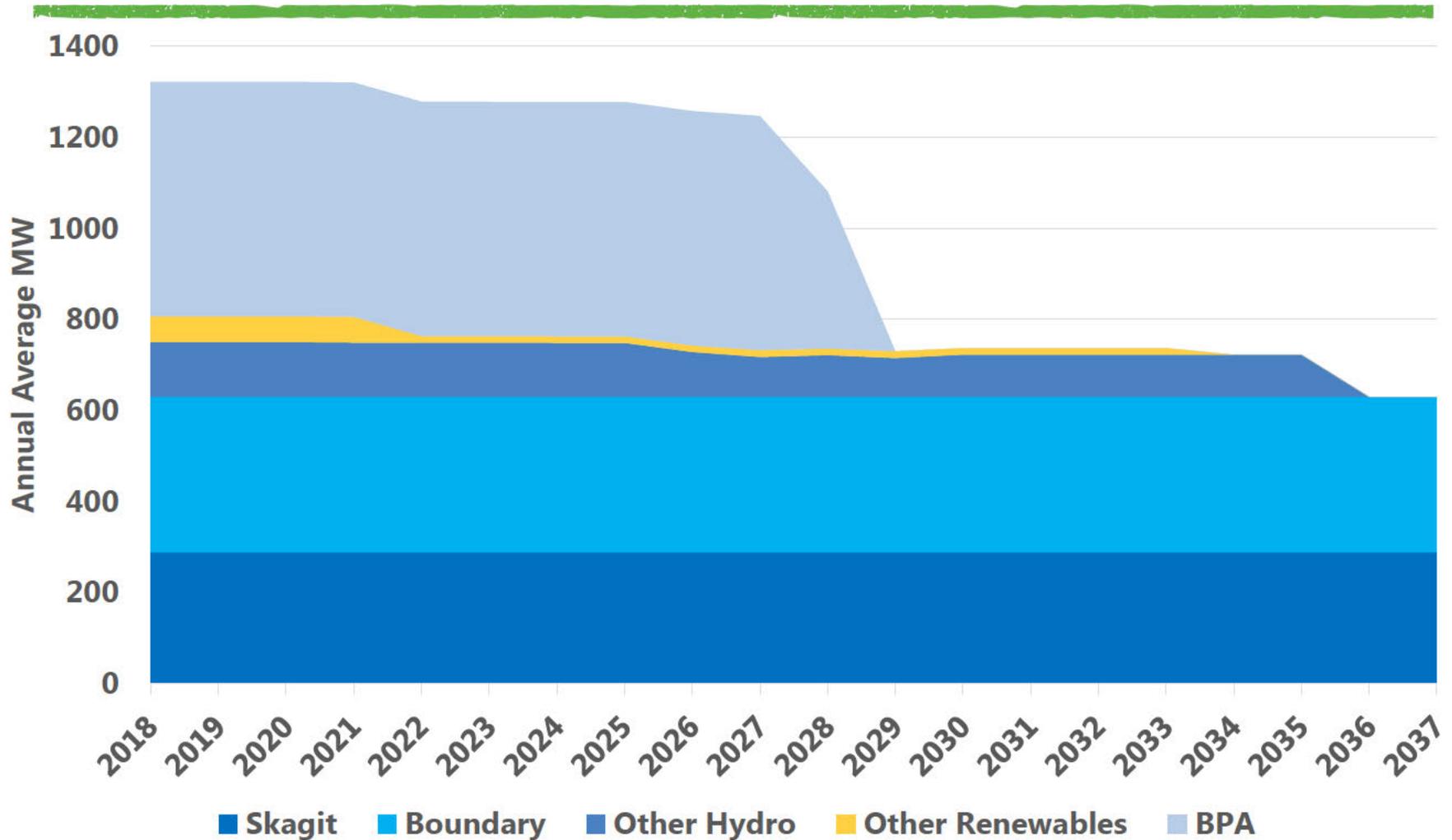
Sources:

Washington State Electric Utility Fuel Mix  
Disclosure Reports

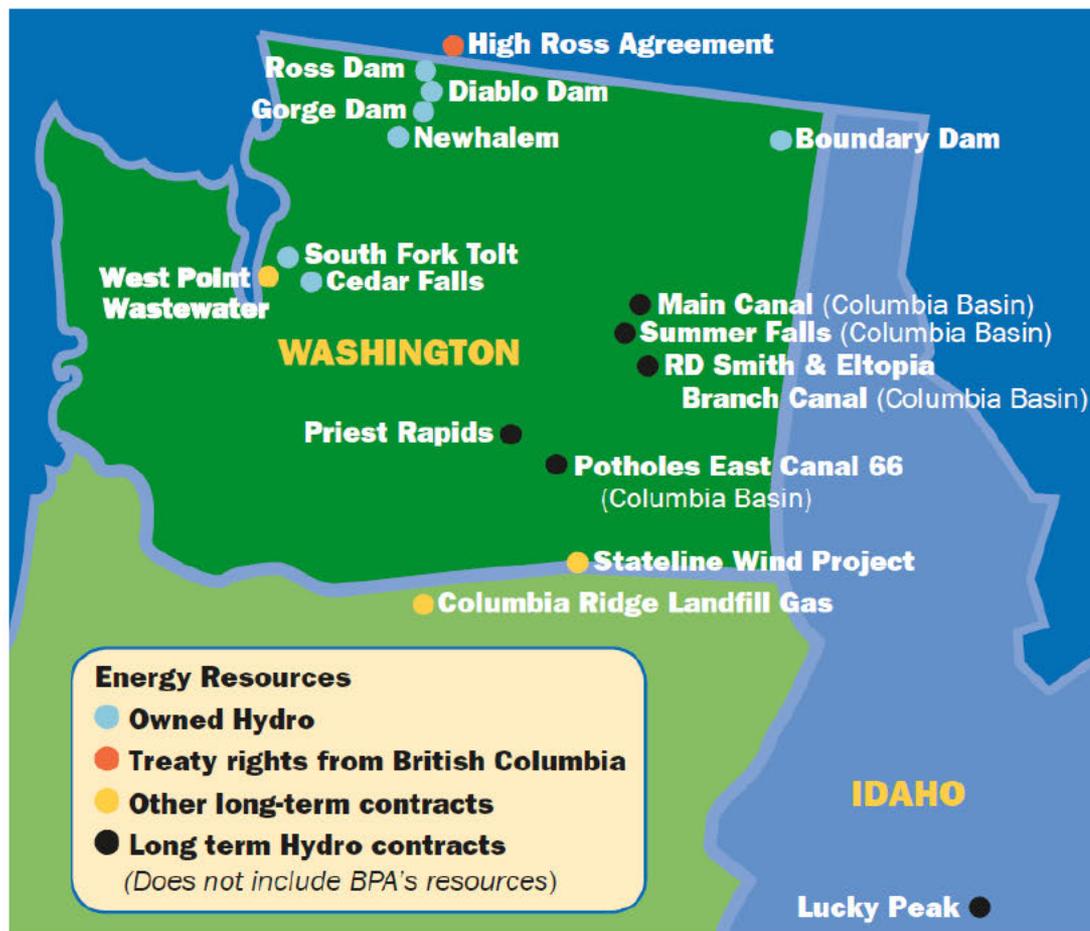
California Energy Almanac- Total System Electric  
Generation

US Energy Information Administration Electricity  
Data Browser – Net Generation Electric Power  
Sector

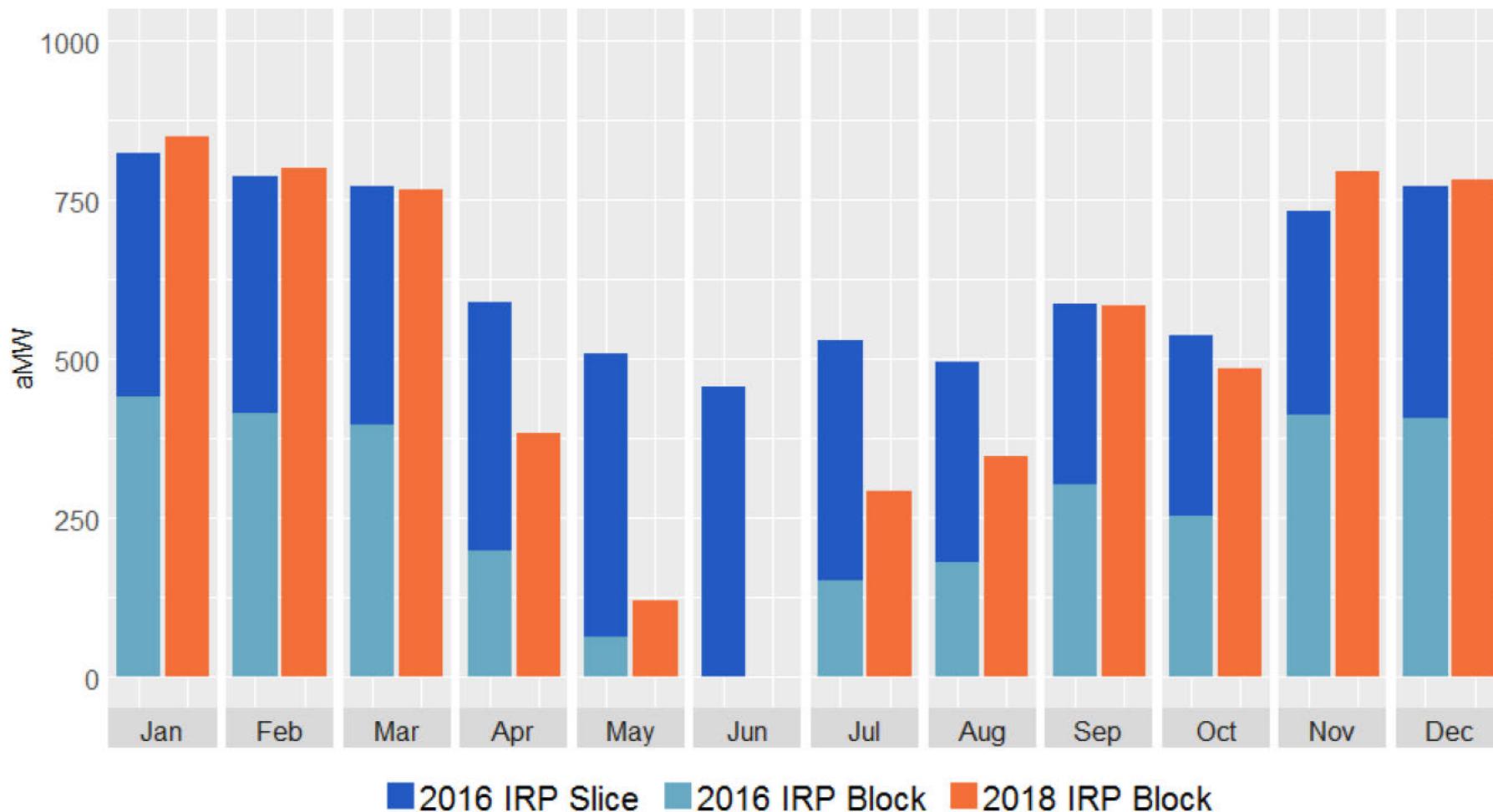
# EXISTING RESOURCES 20 YEAR EXPECTED GENERATION



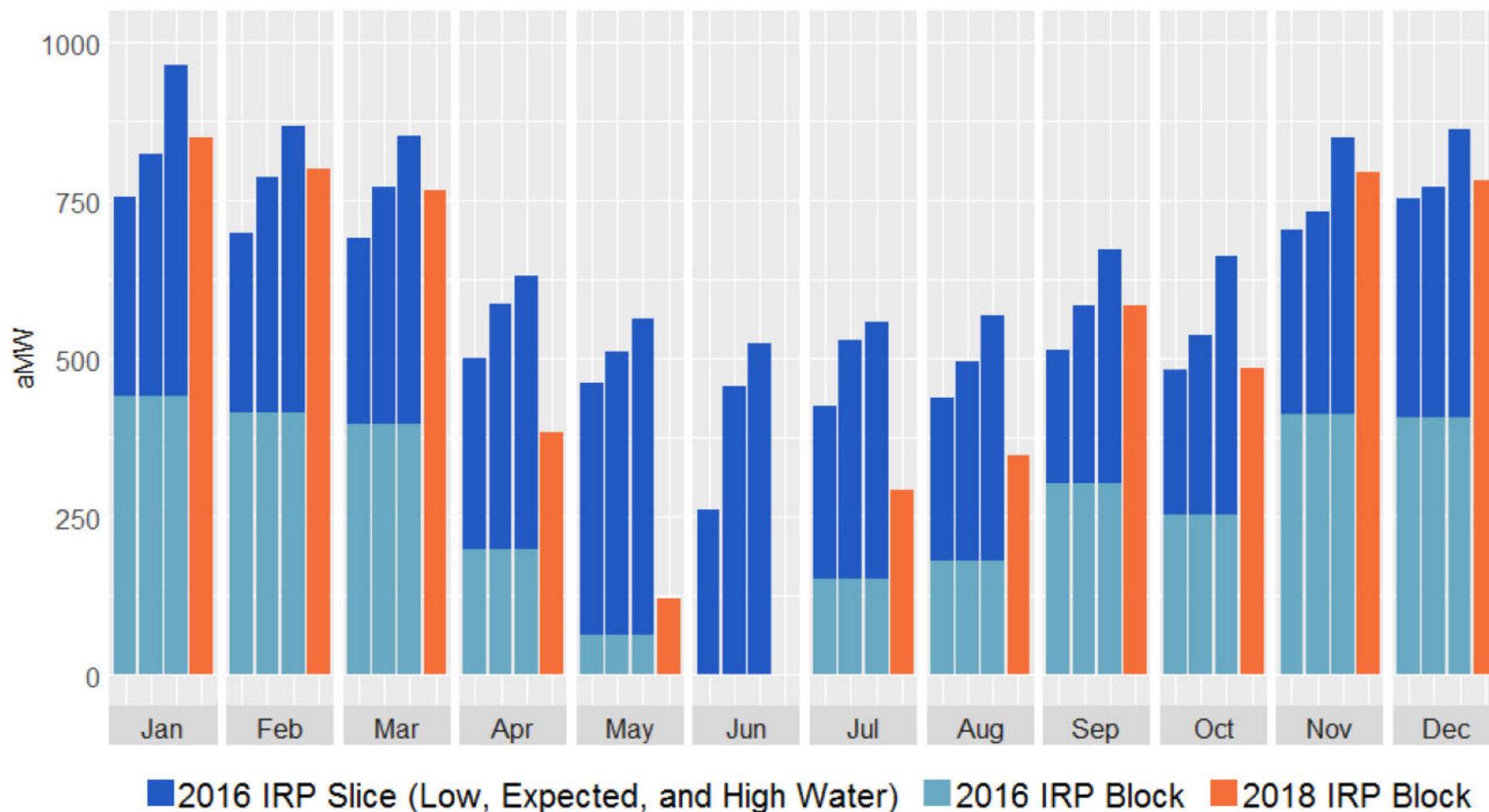
# MAP OF CITY LIGHT RESOURCES AND CONTRACTS



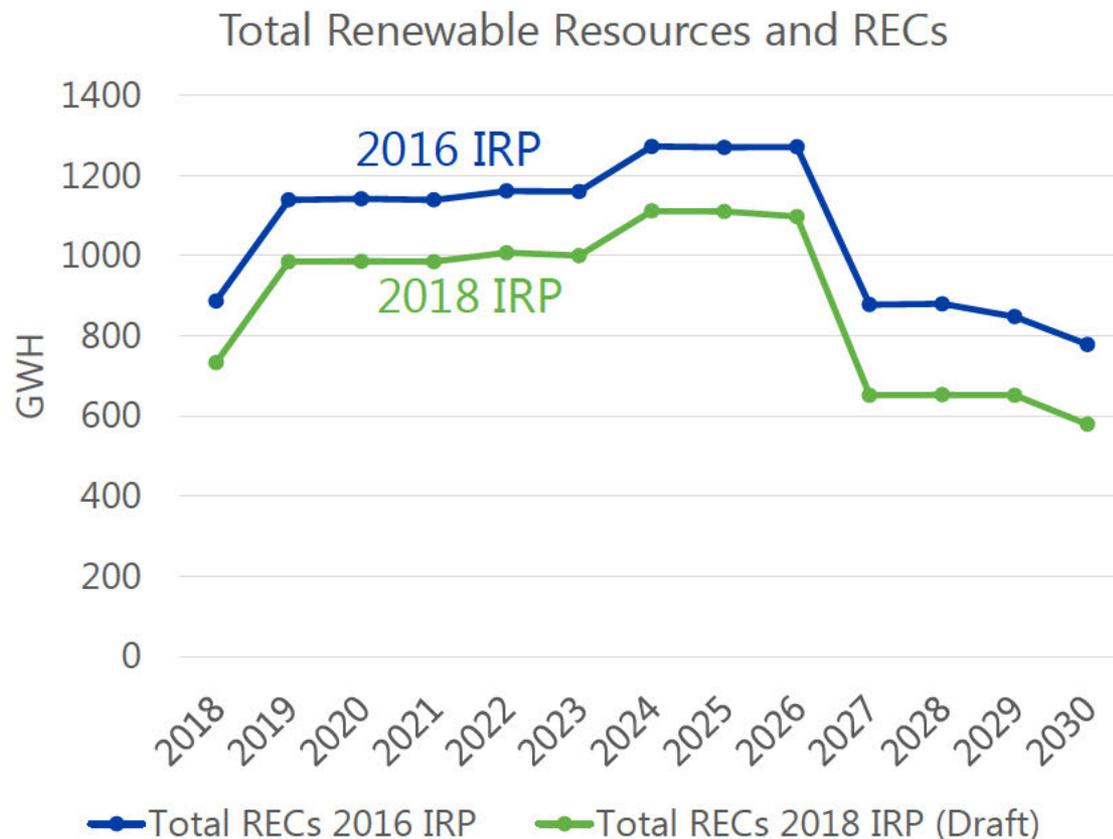
# BPA CONTRACT SLICE VS BLOCK MONTHLY



# REDUCED VARIABILITY IN BPA CONTRACT

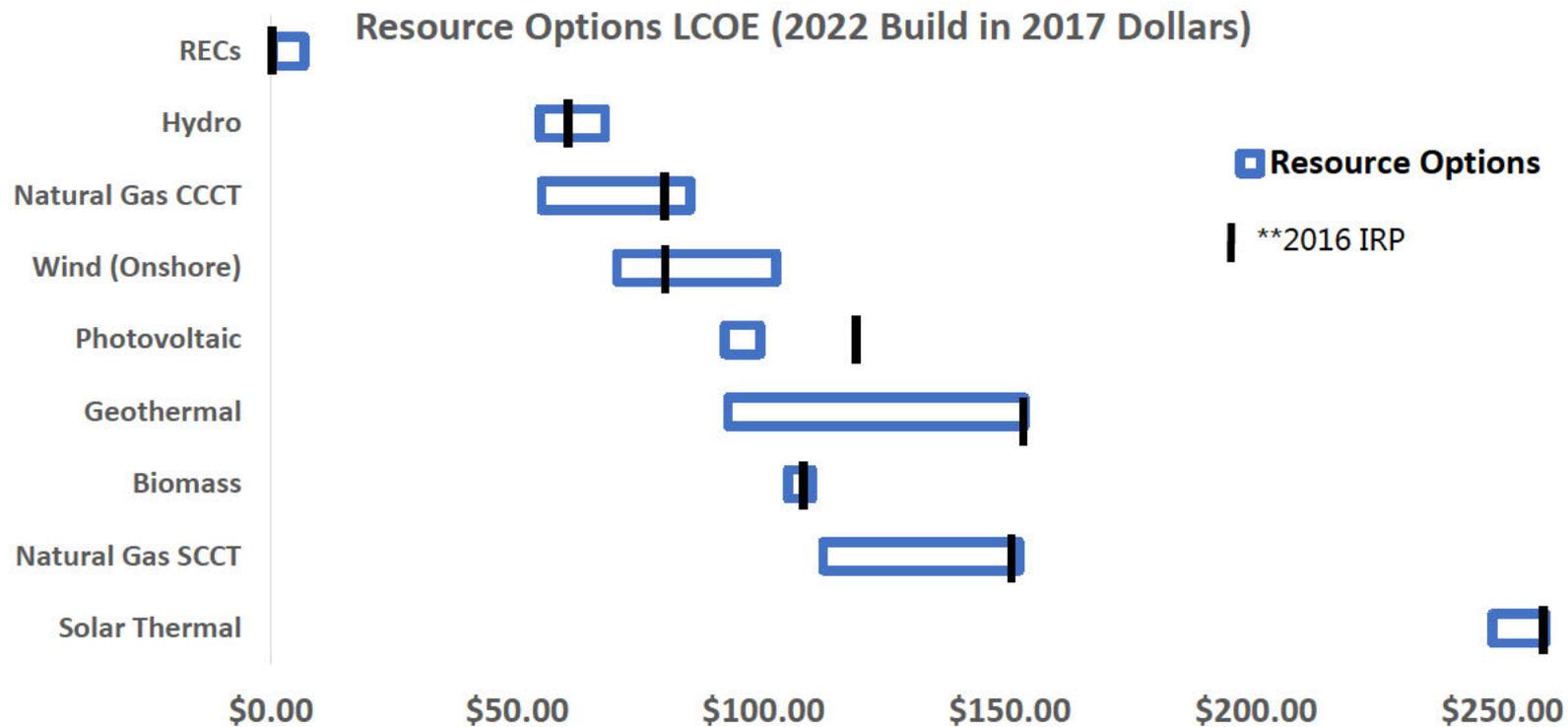


# 2016 IRP VS 2018 IRP: CITY LIGHT RPS RESOURCES



- Main reductions:
- Boundary Units #55 & #56 (39 GWh)
  - 3 Exergy Projects (150 GWh)

# 2018 RESOURCE OPTIONS COST PRELIMINARY OUTLOOK



# 2018 IRP SCENARIOS

Name	Description
Expected	Expected conditions
High Demand	High SCL demand
Low Demand	Low SCL demand
High NG	High natural gas market prices
Low NG	Low natural gas market prices
CO <sub>2</sub> Market	CO <sub>2</sub> Market Scenario
High Water	Abundant water conditions
Low Water	Scarce water conditions
????	<b>New scenarios can be modeled in 2020 IRP</b>

## NEXT STEPS

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- Complete updates of inputs and assumptions
- Perform resource adequacy assessment based on variations in load (demand) and hydro conditions (supply)
- Update candidate portfolios with new contract information and to meet new resource adequacy and renewable portfolio standard requirements
- Design scenarios for portfolio testing



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BREAK





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# 2018 IRP ENERGY AND PEAK FORECAST FOR IRP

Finance

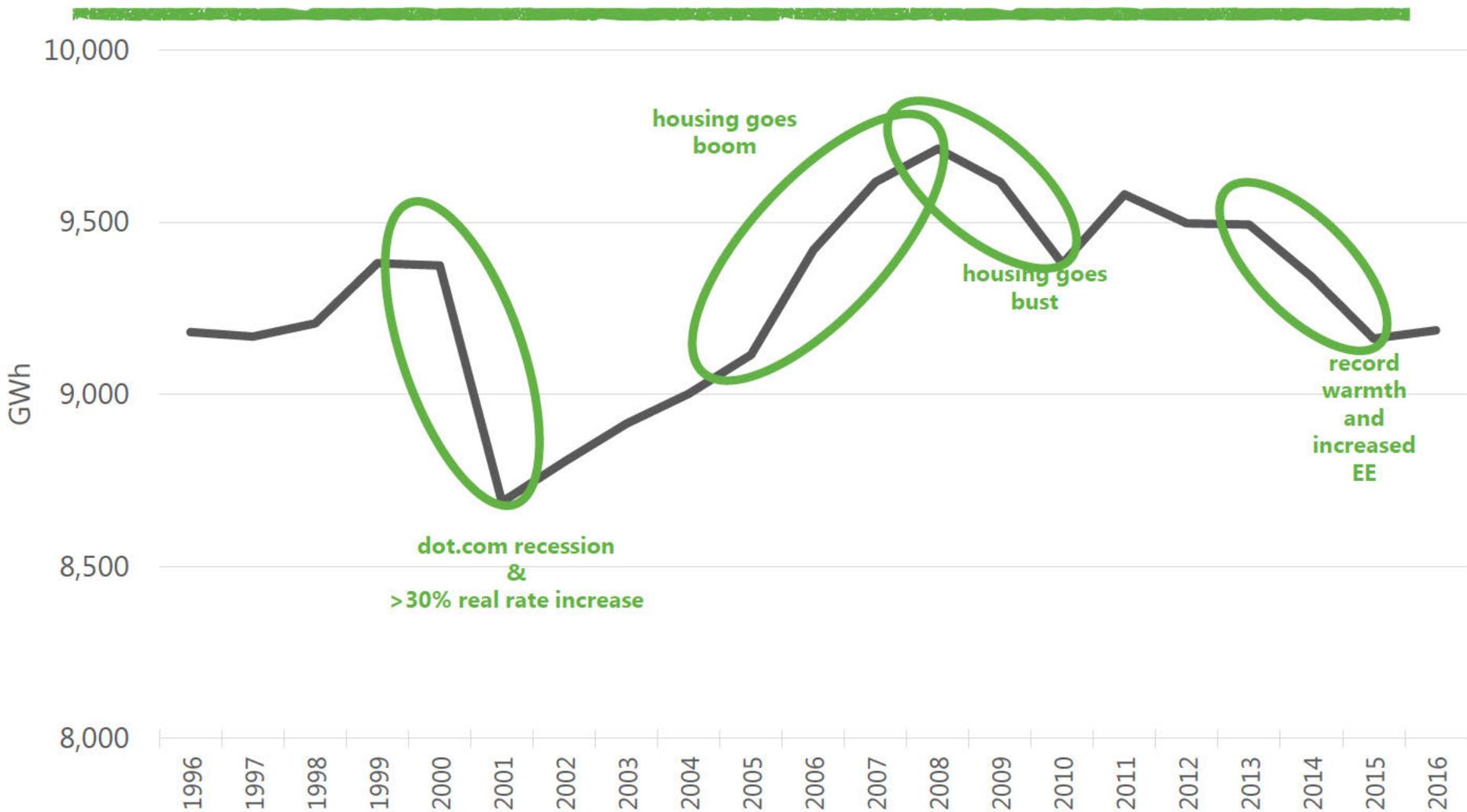


## LOAD FORECAST TOPICS

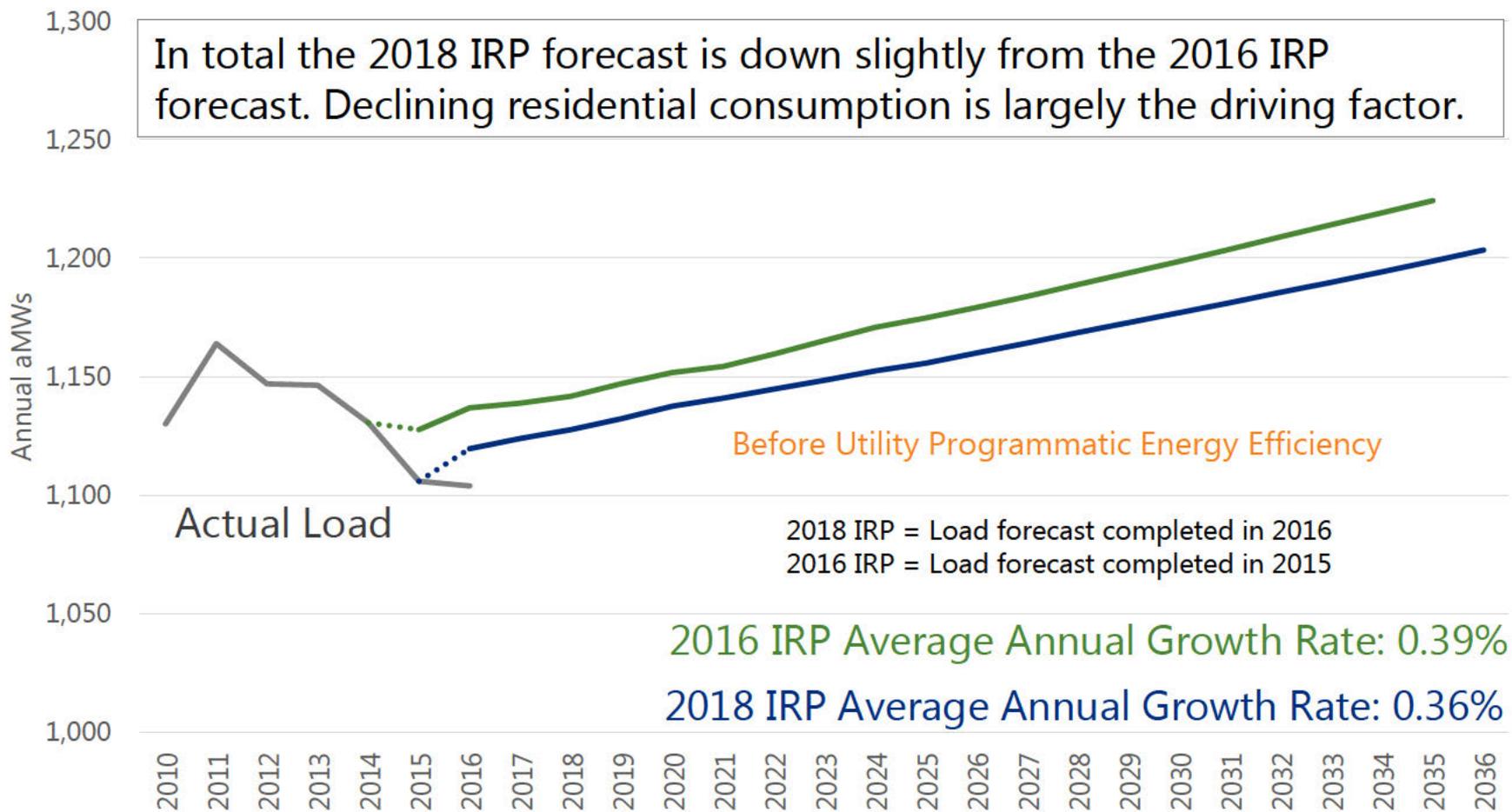
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- 2018 IRP Energy Forecast and Economic Outlook
- 2018 IRP Peak Load Forecast
- New Load Forecasting Methodology Overview

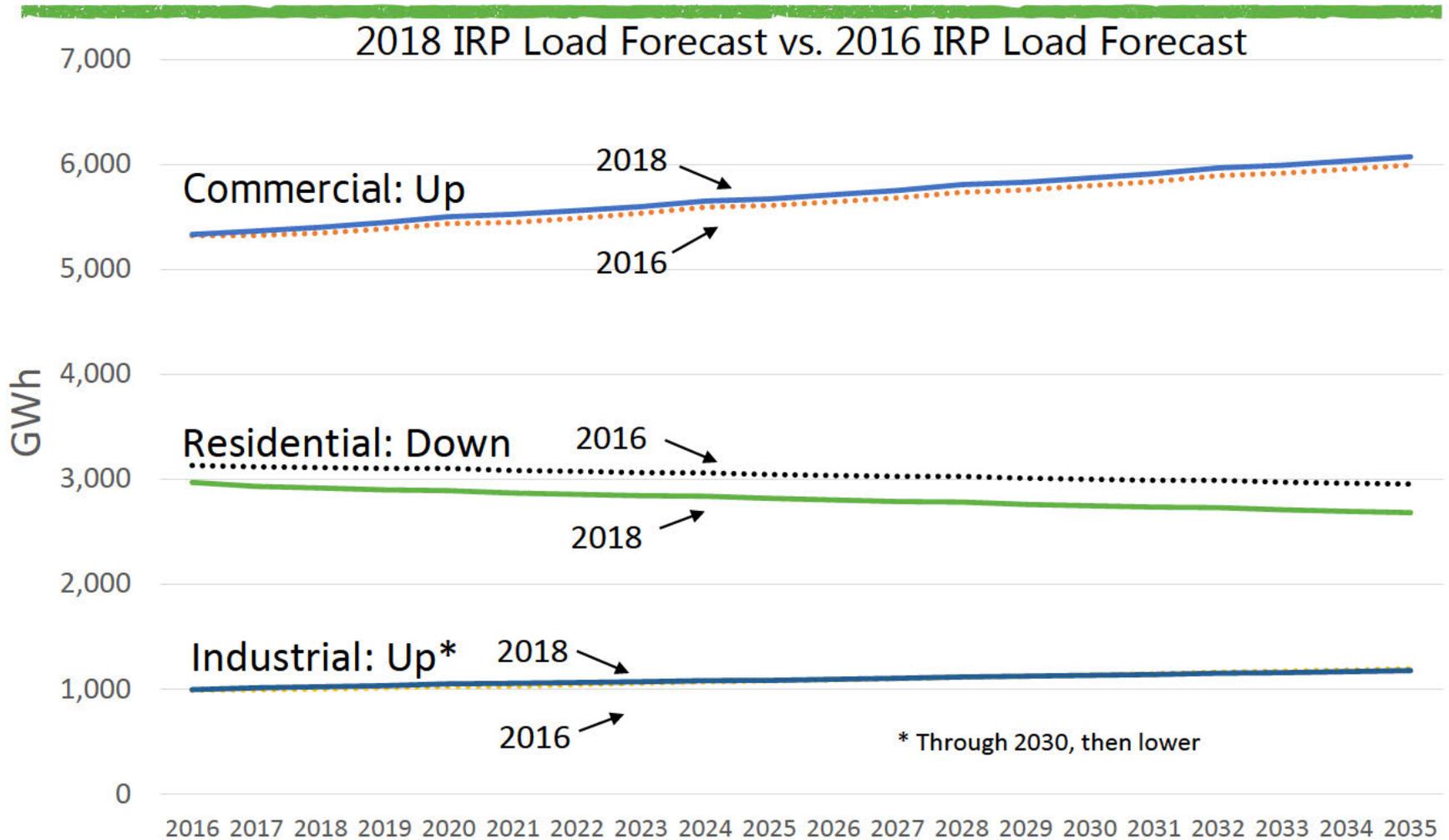
# SEATTLE CITY LIGHT RETAIL LOAD HISTORY



# 2018 IRP VS. 2016 IRP LOAD FORECAST

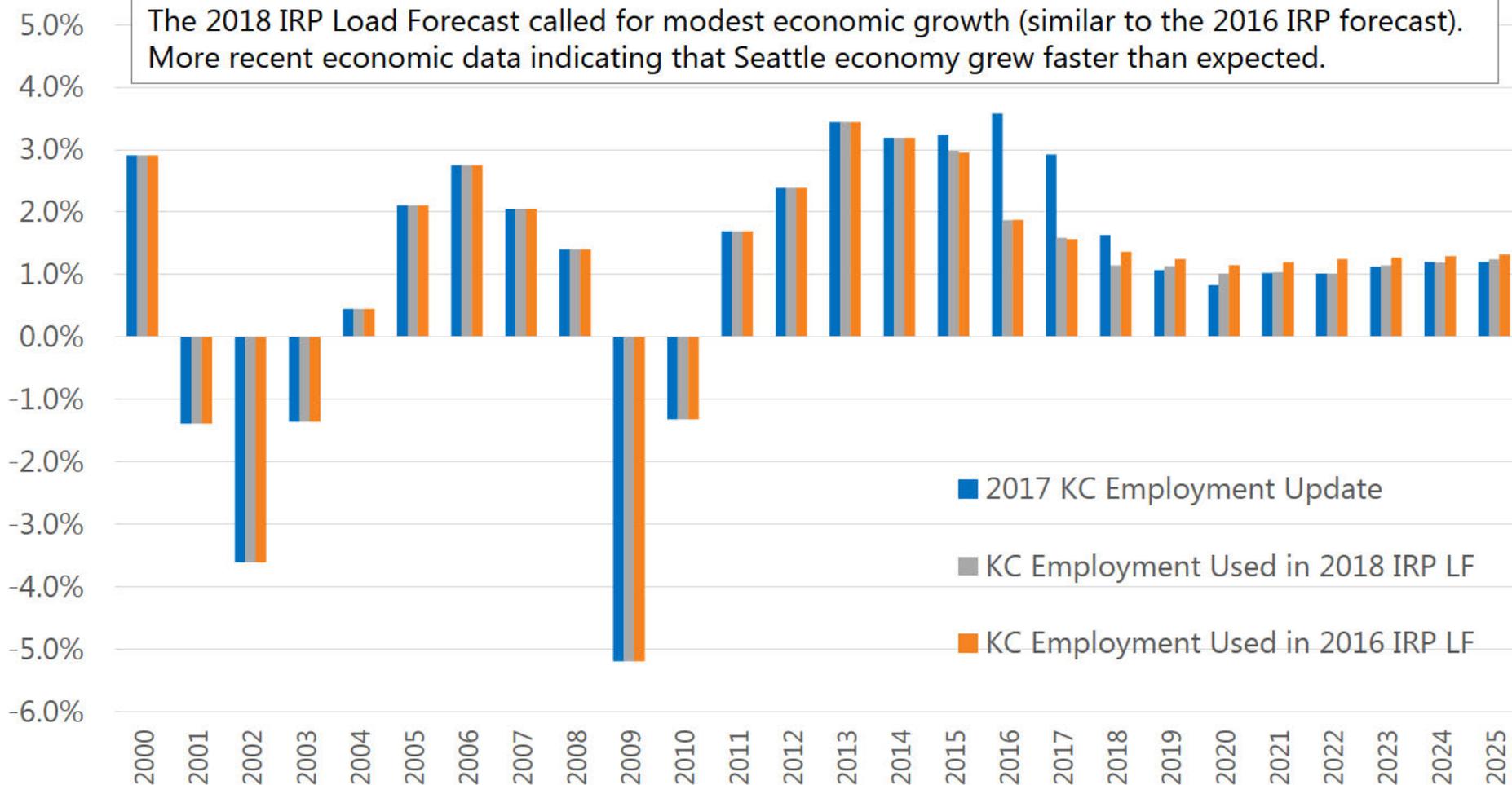


# 2016 IRP LOAD FORECAST: CUSTOMER CLASS BREAKOUT



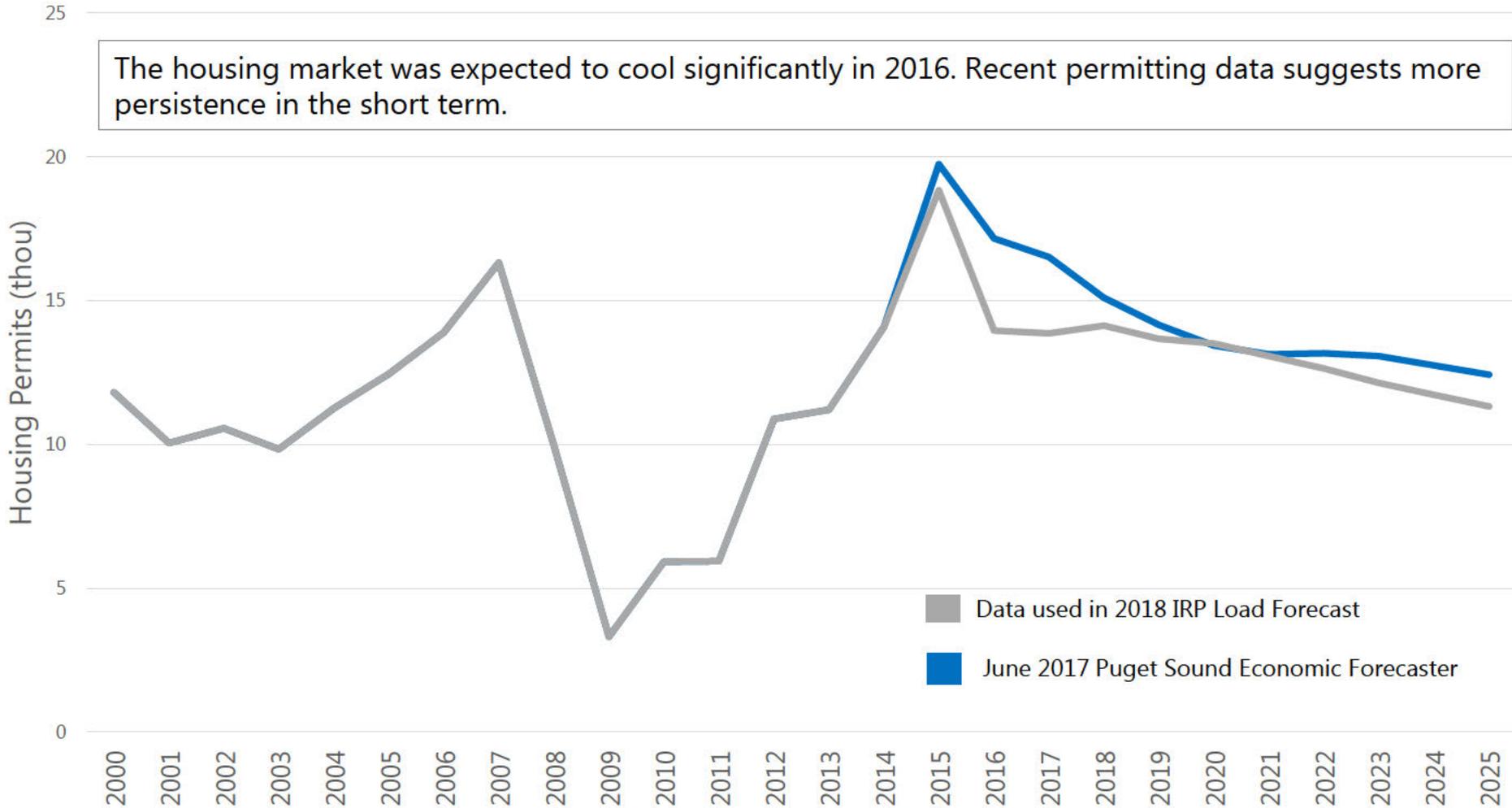
# ECONOMIC OUTLOOK - LOCAL LABOR MARKETS

The 2018 IRP Load Forecast called for modest economic growth (similar to the 2016 IRP forecast). More recent economic data indicating that Seattle economy grew faster than expected.

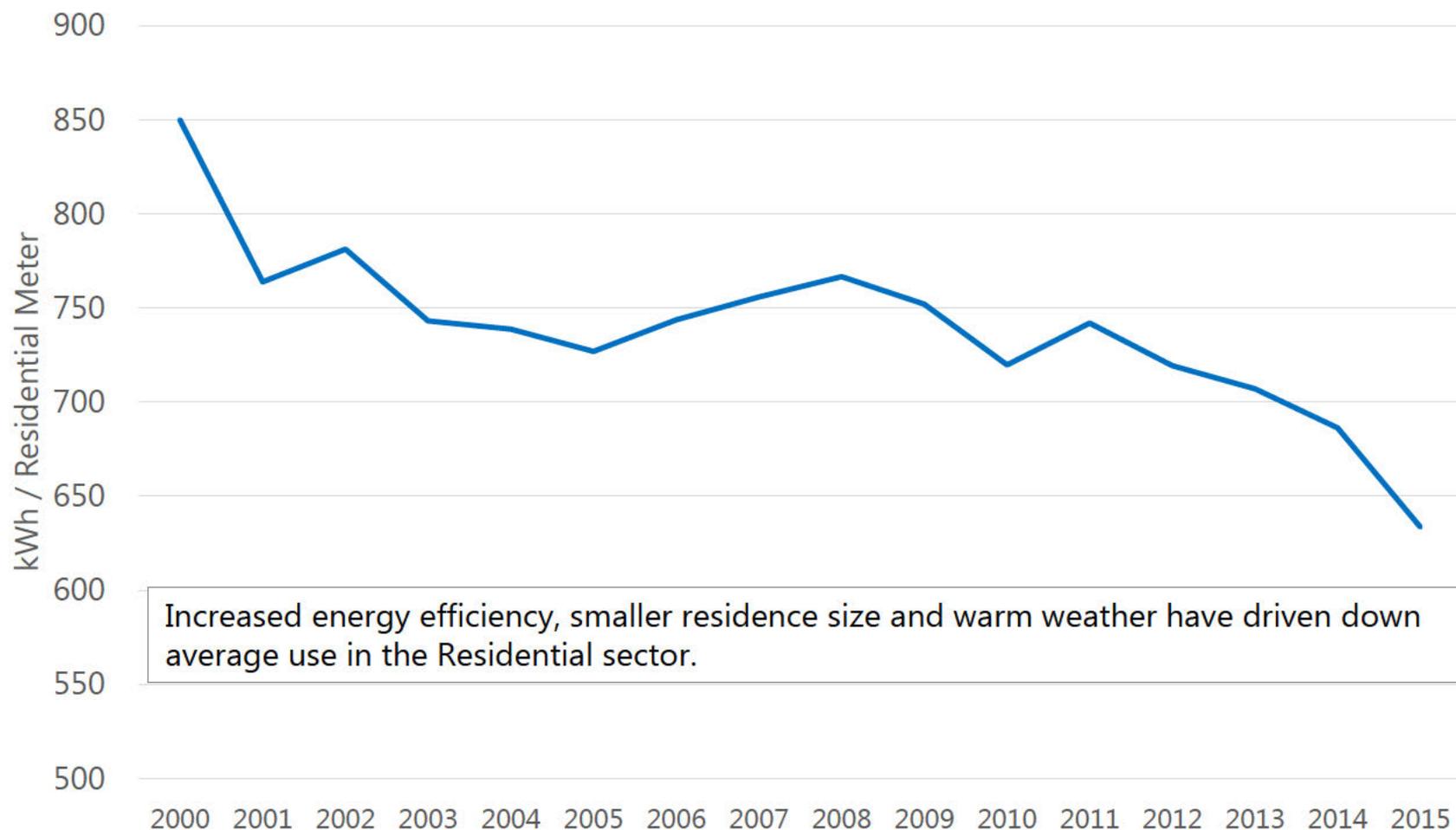


# ECONOMIC OUTLOOK - HOUSING MARKET

The housing market was expected to cool significantly in 2016. Recent permitting data suggests more persistence in the short term.



# MORE EFFICIENCY IN THE RESIDENTIAL SECTOR

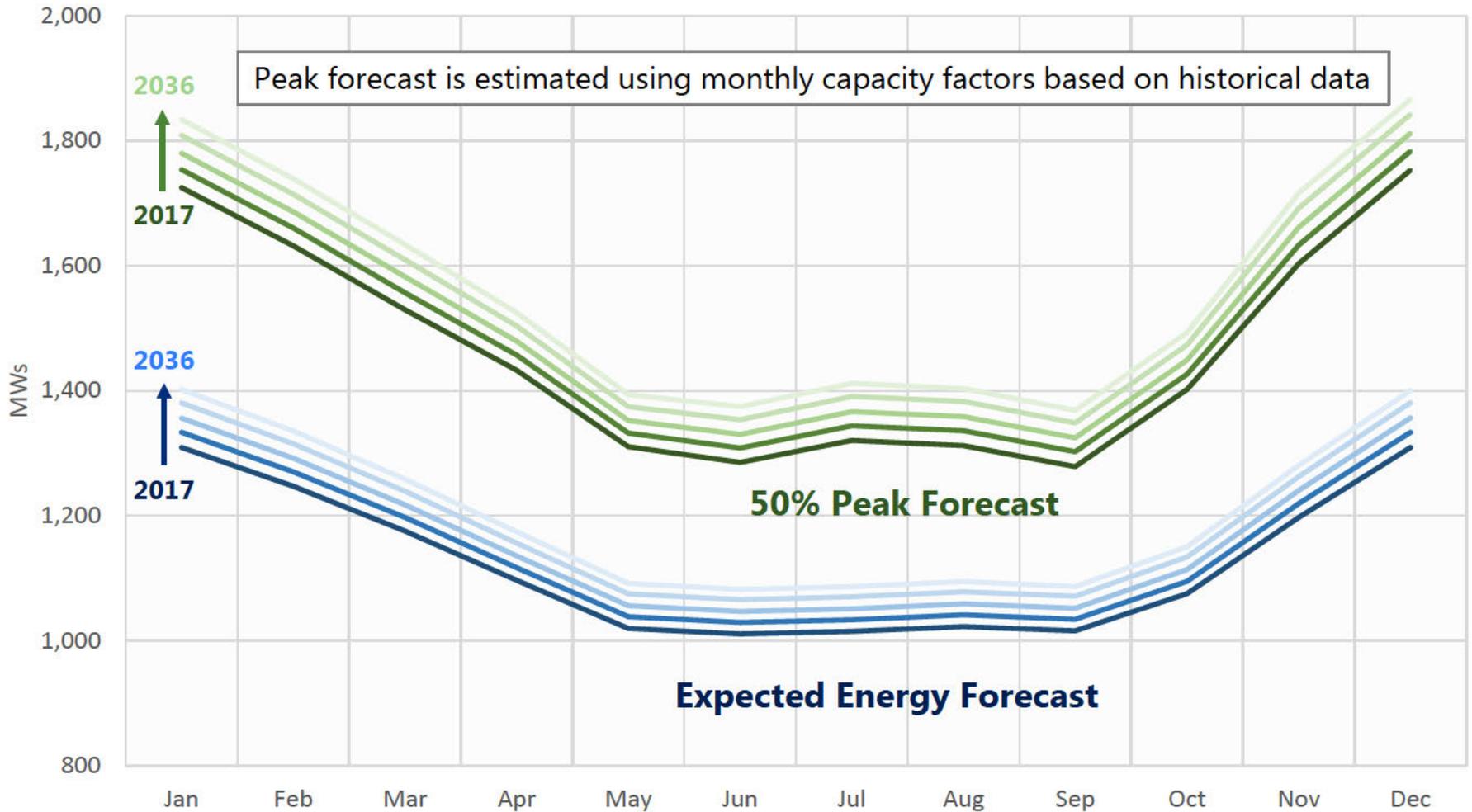


## 2018 IRP LOAD FORECAST TAKEAWAYS

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- Total system load down slightly from 2016 IRP load forecast
  - Residential sales are lower
  - Commercial and Industrial sales are higher
- Total load forecast still predicts mild growth before programmatic energy efficiency
  - Average Annual Growth Rate = 0.36%

# 2018 IRP PEAK LOAD FORECAST



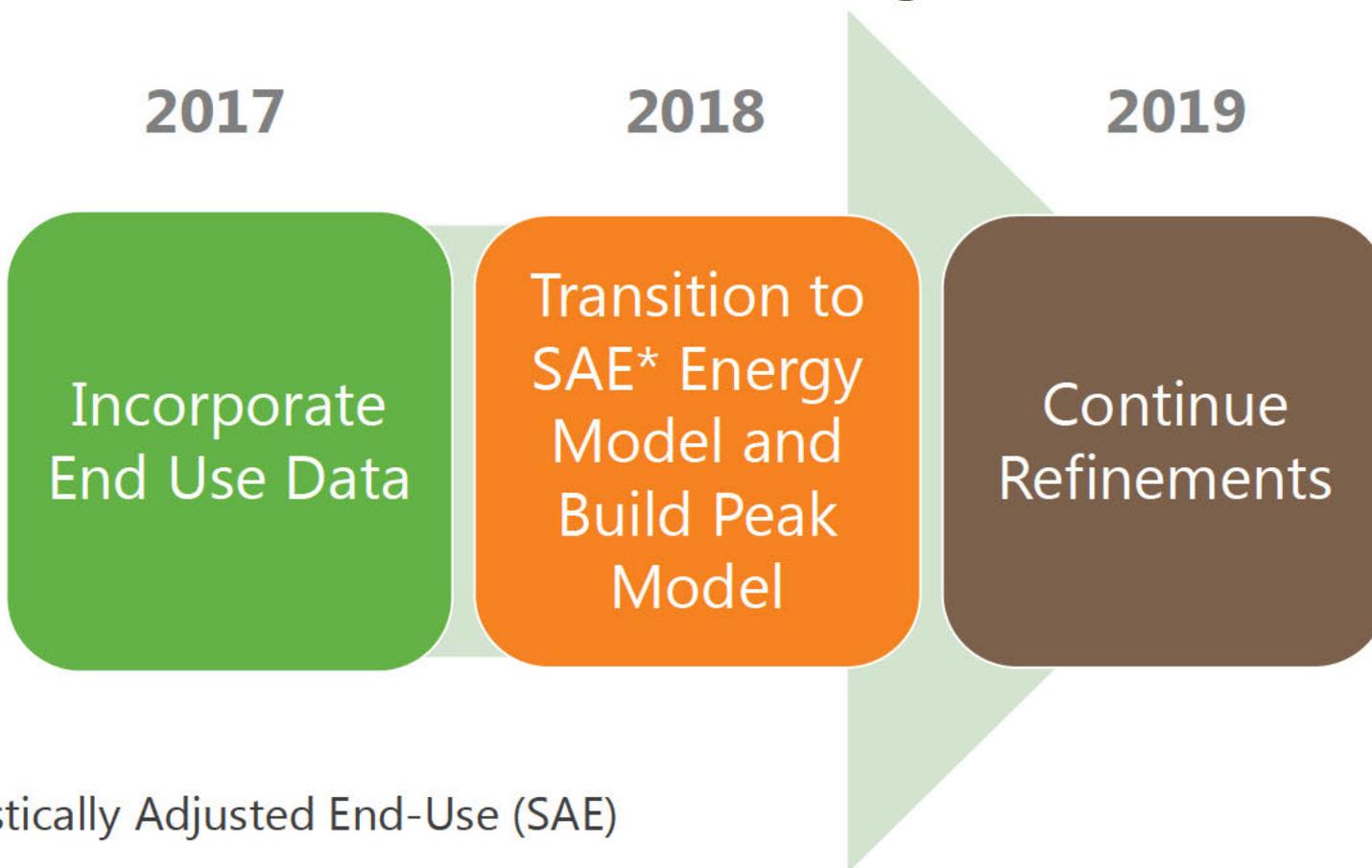
## NEW LOAD FORECAST METHODOLOGY

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- In order to address a myriad of forecast drivers, including demand-side resources and codes and standards, new techniques are now being used
  - to incorporate trends in end uses in addition to weather and economic drivers
- There are several “best-practice” approaches:
  - **Hybrid** approaches start with an econometric model and include end-use factors not typically included in econometric models
  - **Statistically-adjusted end-use (SAE) models** are a specific type of hybrid model (example: ITRON’s model)

# NEW LOAD FORECAST METHODOLOGY – CONT

## Load Forecast Model Going Forward



\*Statistically Adjusted End-Use (SAE)

## NEW LOAD FORECAST METHODOLOGY - CONT

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- Traditional Residential Modeling Variables
  - Real Electricity Price, Unemployment Rate, HDD, Time Series Component
- Example of Variables in a basic SAE
  - (Appliance Stock)x(Real Income)
  - (Appliance Stock)x(Real Electric Price)
  - (HDD)x(Heating Equip Efficiency)x(Shell Integrity)
  - (CDD)x(Cooling Equip Efficiency)x(Shell Integrity)



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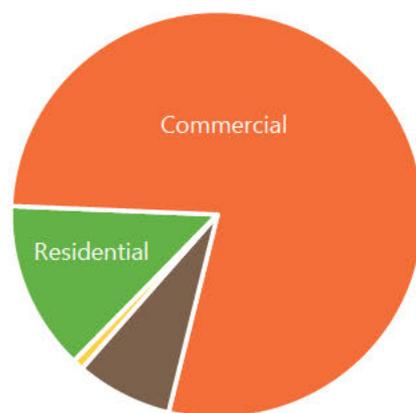
# CONSERVATION POTENTIAL ASSESSMENT

Customer Energy Solutions



## ACHIEVABLE POTENTIAL (AMW)

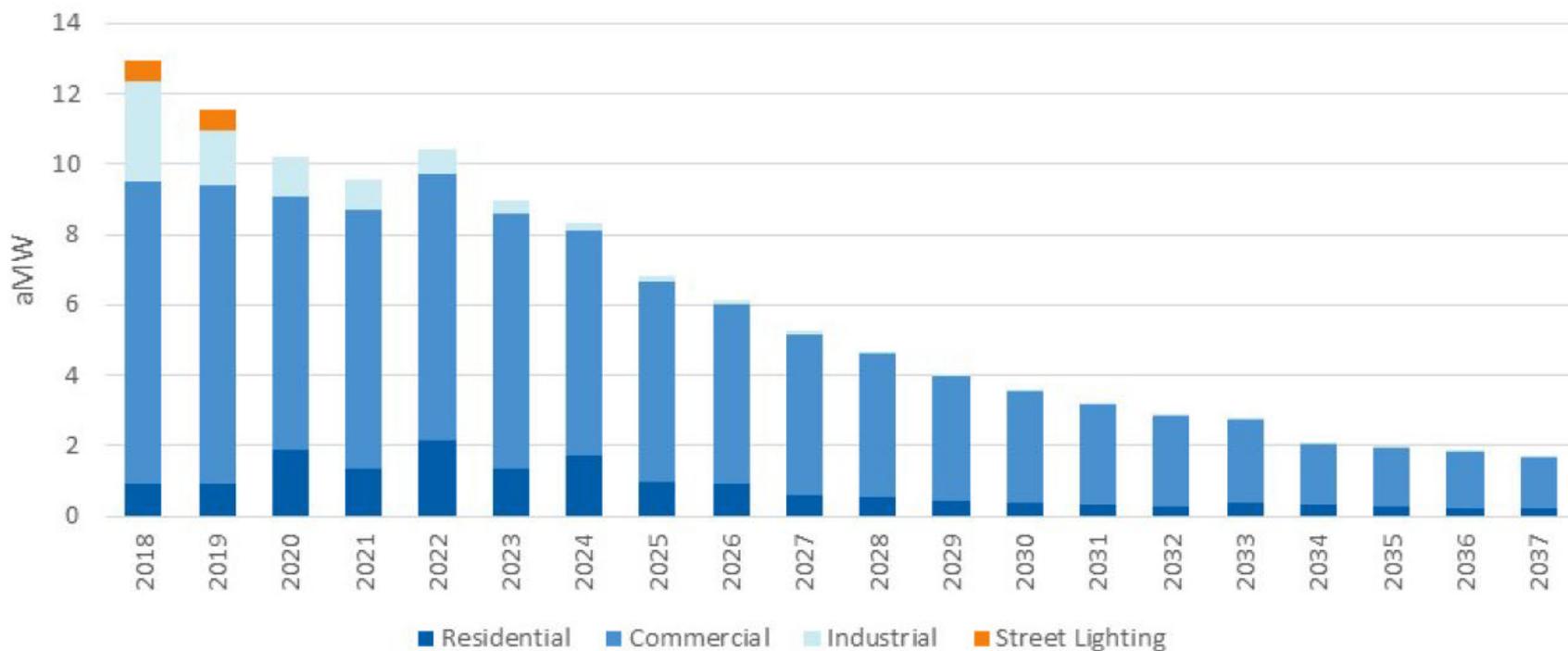
	Two Year	Ten Year	20 Year	20% of Ten-Year Potential
<b>2016 CPA</b>	25.6	128.1	204.8	25.6
<b>2018 CPA</b>	24.5	90.3	119.0	18.1



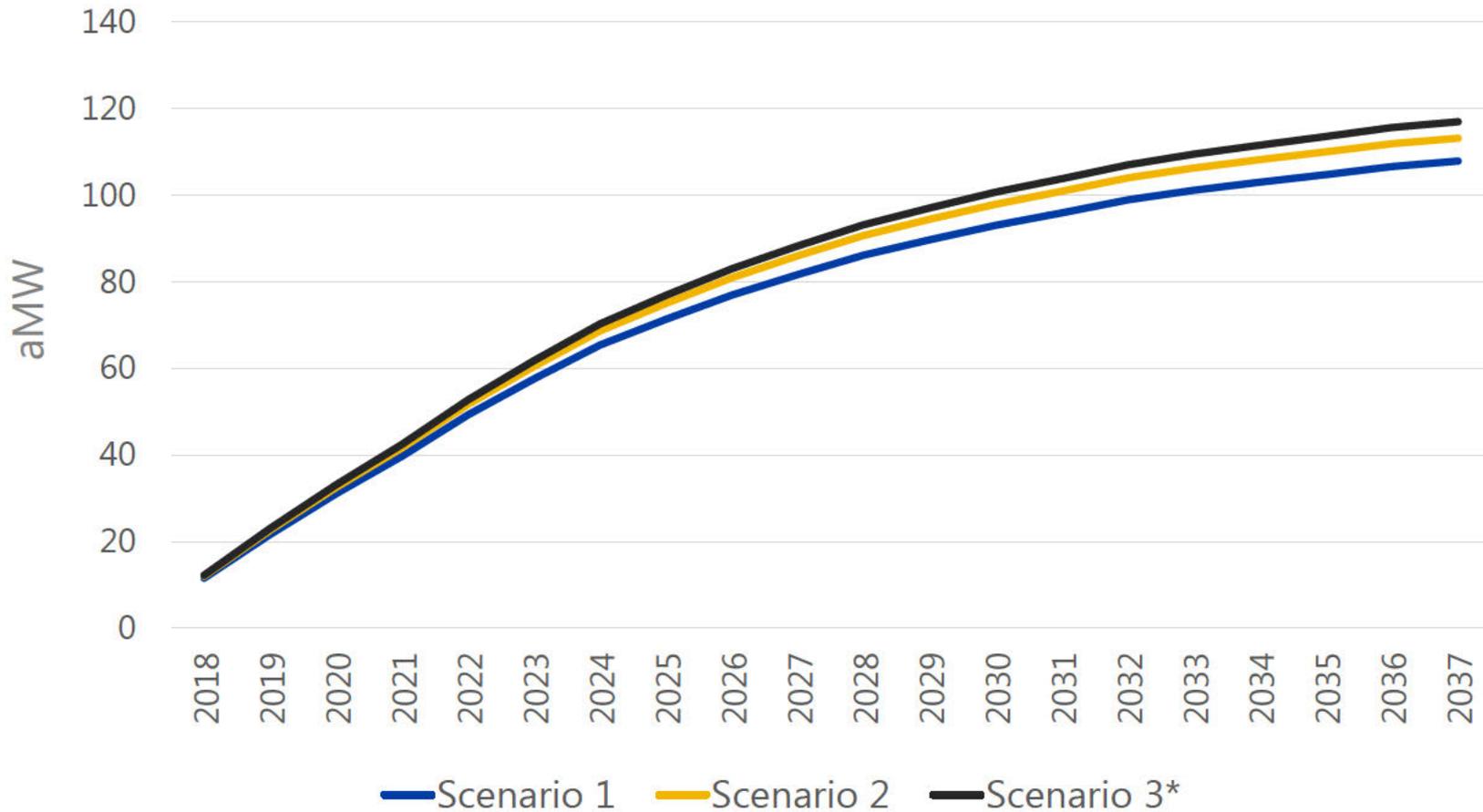
**Residential:** 14% (2.6 aMW)  
**Commercial:** 78% (13.6 aMW)  
**Industrial:** 7% (1.6 aMW)

\*2018 20-year achievable potential

# INCREMENTAL ACHIEVABLE POTENTIAL (CURRENT CPA)



# IRP SCENARIOS (DRAFT)





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WRAP UP



## OCTOBER TOPICS

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How will we reassess City Light's IRP strategy?

- ✓ What do we have? (resources and contracts)
- ✓ How much do we need? (to meet peak demand and renewable portfolio standards)
- ✓ How can we fill that need? (portfolio options)
- ❑ Which options are robust? (scenario testing)
- ❑ Where's the best value? (reliability, cost, risk, and environmentally responsible)

# POTENTIAL 2018 IRP DISCUSSION TOPICS & PLANNING FOR 2020

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- Western Energy Imbalance Market participation
- Environmental policy changes (federal vs state)
- BPA Focus 2028
- Recent climate change studies
- Demand response and battery storage resource options
- Load forecast and distribution planning processes
- Solar microgrid for resilience pilot
- RSJI efforts at City Light and IRP
- City of Seattle's carbon neutral by 2050
- Other

## Integrated Resource Plan information

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[www.seattle.gov/light/irp](http://www.seattle.gov/light/irp)

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Manager

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# CITY LIGHT

## OUR MISSION

Seattle City Light is dedicated to delivering customers affordable, reliable and environmentally responsible electricity services.

## OUR VISION

We resolve to provide a positive, fulfilling and engaging experience for our employees. We will expect and reinforce leadership behaviors that contribute to that culture. Our workforce is the foundation upon which we achieve our public service goals and will reflect the diversity of the community we serve.

We strive to improve quality of life by understanding and answering the needs of our customers. We aim to provide more opportunities to those with fewer resources and will protect the well-being and safety of the public.

We aspire to be the nation's greenest utility by fulfilling our mission in an environmentally and socially responsible manner.

## OUR VALUES

Safety, Environmental Stewardship, Innovation, Excellence, Customer Care

