PNM 2020-2039 Integrated Resource Plan

October 22, 2019

Distributed Generation, Energy Efficiency,

& Time-of-Day Rates

Agenda

- Welcome and Introductions
- Safety and Ground Rules
- Online Participation Instructions
- Energy Efficiency (EE)
- Distributed Generation (DG)
- Time of Day Rates (TOD)
- Outline of next meeting's topic

Nick Phillips
Director, Integrated Resource Planning

Mr. Phillips manages the PNM Resource Planning department and is responsible for developing PNM resource plans and the regulatory filings to support those resource plans.

Prior to joining PNM, Mr. Phillips was involved with numerous regulated and competitive electric service issues including resource planning, transmission planning, production cost analysis, electric price forecasting, load forecasting, class cost of service analysis, and rate design.

Mr. Phillips received the Degree of Master of Engineering in Electrical Engineering with a concentration in Electric Power and Energy Systems from Iowa State University of Science and Technology, and the Degree of Master of Science in Computational Finance and Risk Management from the University of Washington Seattle.

Safety and logistics

- In case of an emergency please exit to the right of the stage towards the main entrance.
- Restrooms: Exit door to the left make another left and restrooms will be on your left-hand side.

Meeting ground rules

01

- Questions and comments are welcome – One Person Speaks at a Time

02

- Reminder; today's presentation is not PNM's plan or a financial forecast, it is an illustration of the IRP process

03

- Please wait for the microphone to raise your question or make your comment so we can ensure you are clearly heard and recorded. ***Only Q&A are transcribed for our filing package***.
- Questions and comments should be respectful of all participants

04

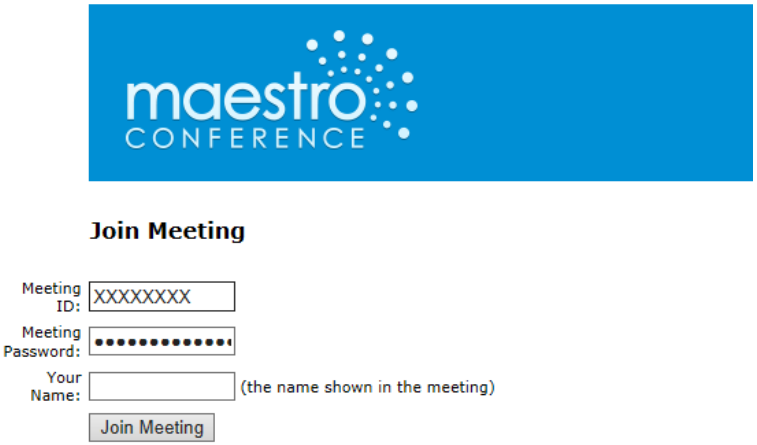
- These meetings are about the 2020 IRP, questions and comments should relate to this IRP. Any questions or comments related to other regulator proceedings should be directed towards the specific filing

Online Participation

Please follow these steps to join:

1) To view the presentation:
   a. Select the Screen Sharing hyperlink from the notification email
   b. Enter your name
   c. Select “Join Meeting”

2) Press 1 on your phone to ask a question or make a comment during the session.



Disclosure regarding forward looking statements

The information provided in this presentation contains scenario planning assumptions to assist in the Integrated Resource Plan public process and should not be considered statements of the company's actual plans. Any assumptions and projections contained in the presentation are subject to a variety of risks, uncertainties and other factors, most of which are beyond the company's control, and many of which could have a significant impact on the company's ultimate conclusions and plans. For further discussion of these and other important factors, please refer to reports filed with the Securities and Exchange Commission. The reports are available online at www.pnmresources.com.

The information in this presentation is based on the best available information at the time of preparation. The company undertakes no obligation to update any forward-looking statement or statements to reflect events or circumstances that occur after the date on which such statement is made or to reflect the occurrence of unanticipated events, except to the extent the events or circumstances constitute material changes in the Integrated Resource Plan that are required to be reported to the New Mexico Public Regulation Commission (NMPRC) pursuant to Rule 17.7.4 New Mexico Administrative Code (NMAC).

Energy Efficiency & Load Side Management

Zach Johnson

Manager of Energy Efficiency

Topic

1. Energy Efficiency in the 2019 IRP
2. Energy Efficiency Definitions
3. NM Efficient Use of Energy Act
4. PNM Program Highlights
5. Historic Costs and Savings
6. Energy Efficiency Forecast

Energy Efficiency in the 2019 IRP

EE in IRP Rule

- Description of demand-side resources
  - Energy efficiency and load management
- Expected capacity and energy impacts
- Explanation of impact on PNM's load forecast
- Include DSM on PNM loads and resources table

Load Forecast Impact

- One of many factors affecting future energy use
- EE impact is growing due to cumulative nature of savings
  - Measures continue to save year after year
- Program funding is significant – $24.8M in 2019
- Program savings = decrement to the PNM load forecast

Energy Efficiency Definitions

- **Conservation**
  - Using less energy
    - Ex: Higher/lower temps
- **Energy Efficiency (EE)**
  - Using less energy but keeping the same or better level of service
    - Ex: replace incandescent with LED
- **Load Management (LM)**
  - Actions that reduce peak demand or shift demand to off-peak
    - Ex: Ice storage – off-peak cooling
- **Demand Response (DR)**
  - A type of load management – utility control of load
    - Ex: PNM Power Saver
- **Demand Side Management (DSM)**
  - Term that covers all of the above

Energy Efficiency Definitions

Addressed in EE Forecast

PNM EE Programs

- Incentives cause faster uptake
  - Ex: Rebates on LED bulbs

Free Rider Savings

- Form of naturally occurring
- Participant in utility program that would have bought the equipment even without the incentive
- Reported savings = net of estimated free rider savings

Energy Efficiency Definitions

Addressed in Load Forecast

Naturally Occurring EE

- Natural productivity improvements – implicit in forecast
  - Ex: Upgrading equipment, home and business

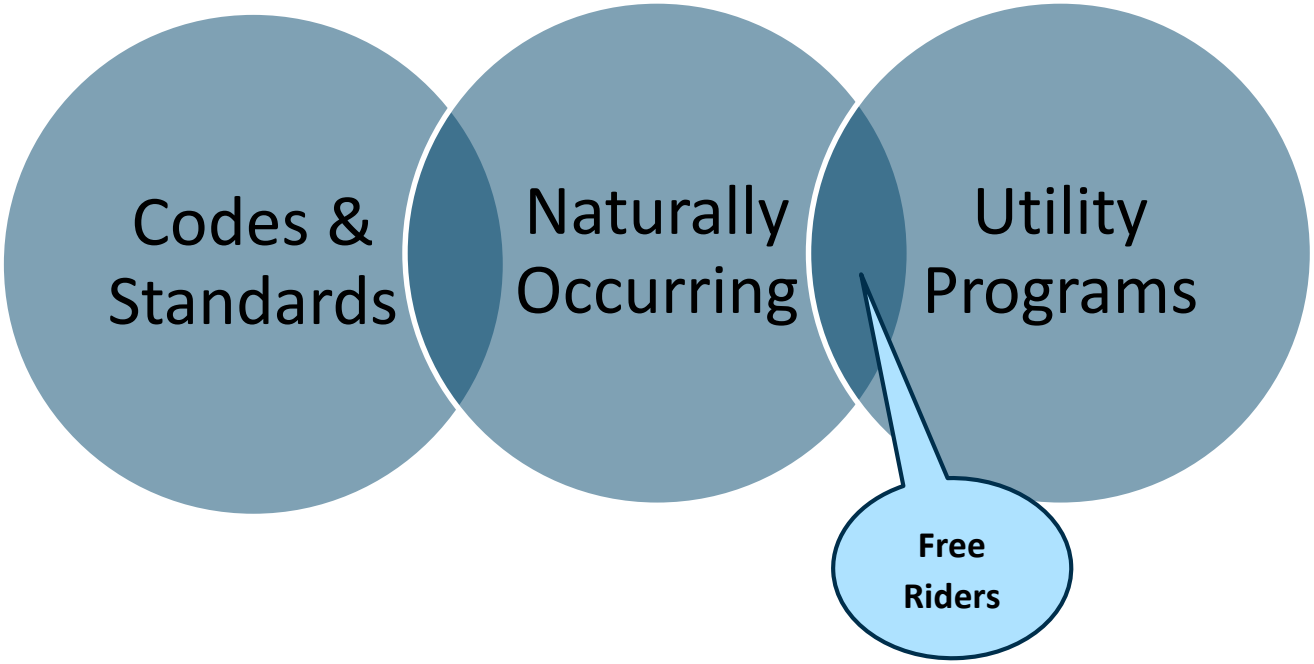
Persistence

- Also referred to as Market Transformation, as well as Codes & Standards. What happens to the savings of a measure after the effective useful life (EUL) of a measure expires.

Codes and Standards

- State building codes
  - Ex: NM code = 2009 IECC
- Federal appliance standards
  - Ex: Minimum SEER ratings

Energy Efficiency Definitions



Enabling Legislation – Efficient Use of Energy Act (EUEA)

- Enacted 2005 – amended in 2008 & 2019
- Requires utilities to offer cost-effective programs
  - Benefits must be greater than costs
  - Utility Cost Test (benefit/cost ratio)
- Independent verification of savings
  - PRC selected evaluator
- EE funding = 3-5% of retail revenues starting 2021
- Energy savings goals
  - 5% of 2020 retail sales by 2026 (5 years 2021 thru 2025)
- Solicit input from interested parties
  - PNM EE public advisory group
- Costs recovered through rate rider
  - PNM Rider 16

PNM Energy Efficiency Programs

- Program highlights

www.pnm.com/rebates

PNM Celebrates 10 years of Energy Efficiency

- Program highlights

❑ Residential Programs

❑ Low Income Programs

❑Business Programs

❑Demand Response

Since 2007: 3,800 GWh Saved		
Residential and business customers have saved enough energy to power more than 562,000 homes for a year	2,346,000 metric tons of total carbon emissions avoided=502,000 vehicles for a year	Total water use avoided 1,294 million gallons of water use avoided

Home Lighting Discount Program

- Residential
  - Point of purchase discounts on standard and specialty LED bulbs
    - Over 10 million bulbs have been incentivized to date
    - In 2018, over 900K LED bulbs were incentivized
    - As of 2018, Approximately 119 retailers are participating across the PNM service area

Cooling Rebate Program

- Residential program
  - Rebates for cooling equipment, smart t-stats and pool pumps

- Rebate amounts range from $100 to $400
- Over $4.5 million in rebates to date
- HVAC contractors promote and assist customers

Refrigerator Recycling

- Residential program

  The Refrigerator Recycling program is one of our longest running and most popular programs

  - Both PNM residential and business customers can participate
  - Over 7K fridges and freezers were recycled in 2018
  - Approximately 80K refrigerators and freezers have been recycled to date

Home Works and Energy Innovation

- Student school kit program

  The primary goal of the student school kit program is to teach and engage future generations about energy in general and the importance of being energy efficient.

  - "Home Works" program is geared towards 5th grade students
  - "Energy Innovation" program is geared towards all high school students including AP Science and Math students
  - The program provided over 9K kits to schools in 2018 in the PNM service area and over 26K to date

ENERGY$mart

- Low Income program

  PNM provides funding to supplement existing federal and state funds for weatherization services

  - PNM has worked with the NM Mortgage Finance Authority on various income-based weatherization type program initiatives since our programs began
  - MFA's sub-grantees administer the program across PNM's service area
  - Additional measures were added last year

MFA
Housing New Mexico

PNM

Easy Savings Kit

- **Income qualified**
  - Offered to select residential and qualified energy assistance customers.
  - Free Easy Savings kit is sent via mail order or through agency partners.
  - Includes energy efficient products for installation and tips on how to save energy and money.
  - In 2018, a total of 6,211 kits were distributed.

- **Program overview:**

Home Energy Checkup (HEC)

- Residential HEC / income qualified HEC

Package A- $15

- Up to 20 ENERGY STAR® LED dimmable bulbs (replacing incandescent bulbs)
- One LED night light
- Up to two efficient-flow showerheads*
- Two bathroom faucet aerators*
- One kitchen faucet aerator*
- One smart power strip

Package B-$30

- Up to 20 ENERGY STAR® LED dimmable bulbs (replacing incandescent bulbs)
- One LED night light
- Up to two efficient-flow showerheads*
- Two bathroom faucet aerators*
- One kitchen faucet aerator*
- One smart power strip

Package C $15 - Available add-on

for homes with refrigerated air

- Between May 1 and October 31add a professional AC diagnostic evaluation
- Checks airflow and equipment performance
- Available for up to two units per home, $15 per unit, additional half-hour per unit

Income qualified customers receive the HEC for free and may also may qualify for a free refrigerator

ENERGY STAR® Appliances Eligible for Rebate

Refrigerator	$125
Clothes Washer/Dryer	$75
Dishwasher	$50
Freezer	$50
Air Purifier	$50
Attic/Ceiling Insulation*	5-10% rebate

Refrigerated AC Customer Items Eligible for Rebate

Smart Thermostat	$50
Replace Refrigerated AC	$400
AC Tune-Up	$50

Program Co-Funded with NMGC*

PNM®

Commercial Customer Programs

- Business
  - **Retrofit and New Construction :** Pre-set and custom incentives to install energy-efficient equipment in their existing or new facilities
  - **Quick Saver Small Business:** A direct-install program for small business customers who have an annual peak electric demand of 200 kW or less. It offers pre-set incentives for installing qualifying lighting products and refrigeration in existing buildings.
  - **Advanced AC-Tune-up**: Trained professionals provide diagnostic and inspection services to improve the efficiency of commercial HVAC systems.
  - **Multifamily**: Rebates to participating trade allies and property owners to install energy efficiency upgrades in dwelling units and common areas.

Demand Response Programs

- Business and residential
- **Power Saver -** Residential and small commercial customers
  - A device is installed on refrigerated air conditioning units that reduces the compressor run time during an event

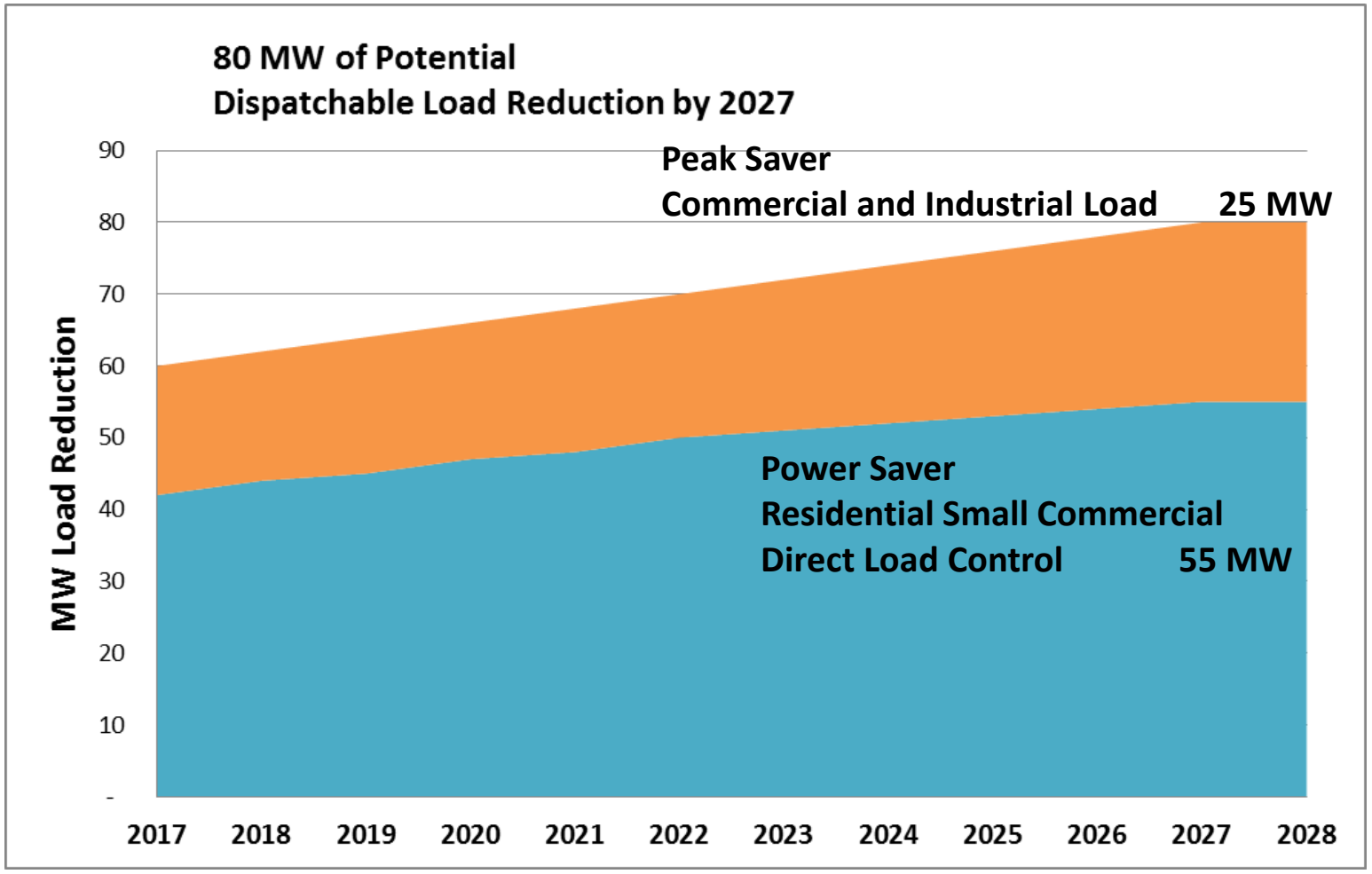
Demand Response Programs

- **Peak Saver** – Larger businesses
  - Customers agree to control non-essential loads during events

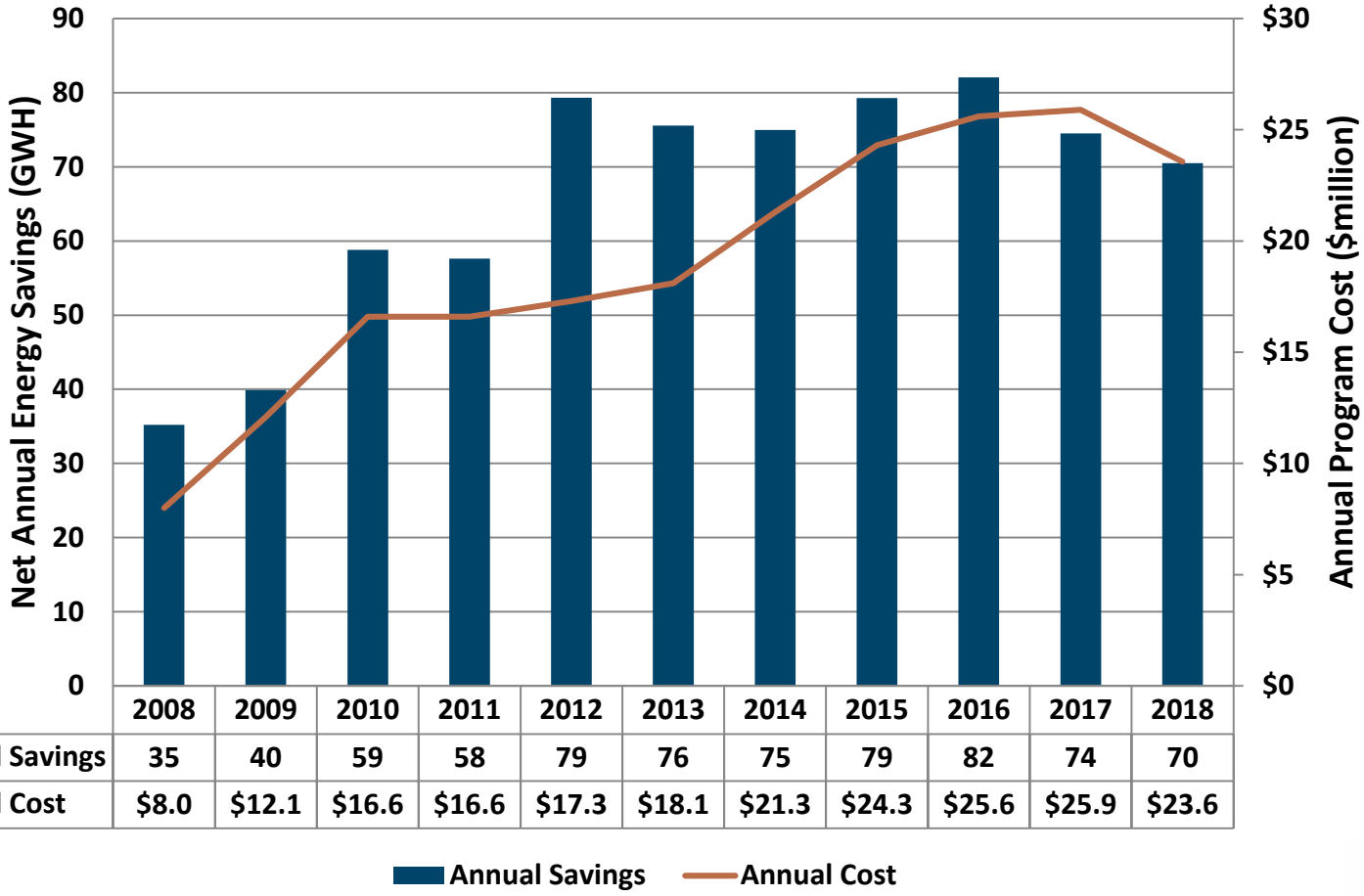
- Load reduction capacity is “dispatched” by PNM system operators
- Utilized on hot summer days to help relieve system peak demand
- 3 “events” in 2019 with average capacity of 48.5 MW
- Currently, about 46,100 customers participate

2017 IRP Demand Response forecast

Peak Demand Reduction illustrated 2018 & 19 are tracking

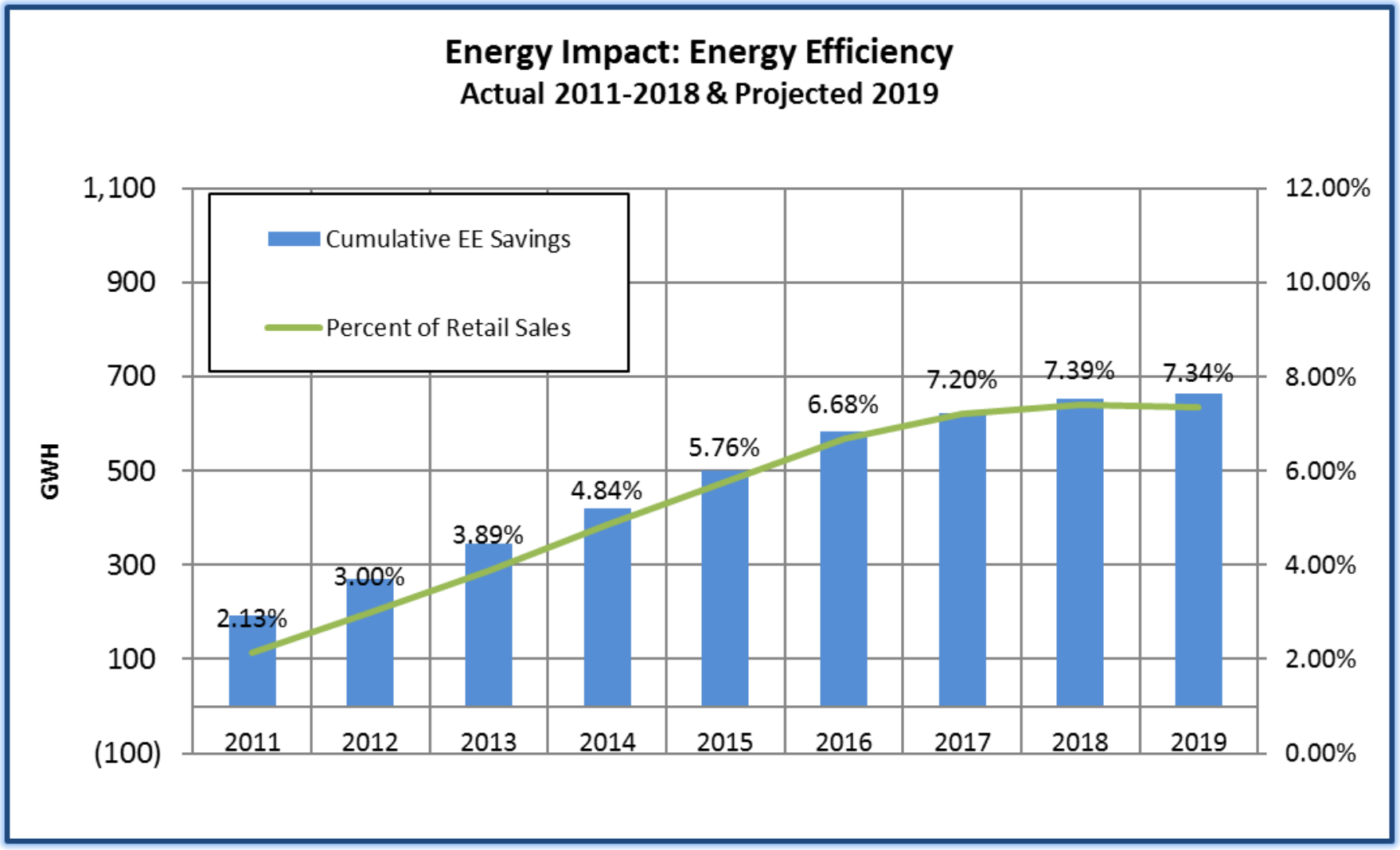


Annual Energy Savings & Program Costs



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Annual Savings	35	40	59	58	79	76	75	79	82	74	70
Annual Cost	$8.0	$12.1	$16.6	$16.6	$17.3	$18.1	$21.3	$24.3	$25.6	$25.9	$23.6

Energy Efficiency as a percentage of PNM retail sales



Energy Efficiency Forecast Assumptions

Factors Impacting EE Forecast

1. Total Portfolio Funding Forecast
2. Program Mix Projections
3. Program Cost Assumptions – $/kWh Saved

Other Assumptions

EE Usage Profiles

- Converts annual savings to hourly

Customer Participation

- *Assumed to continue participating as long as programs are attractive*

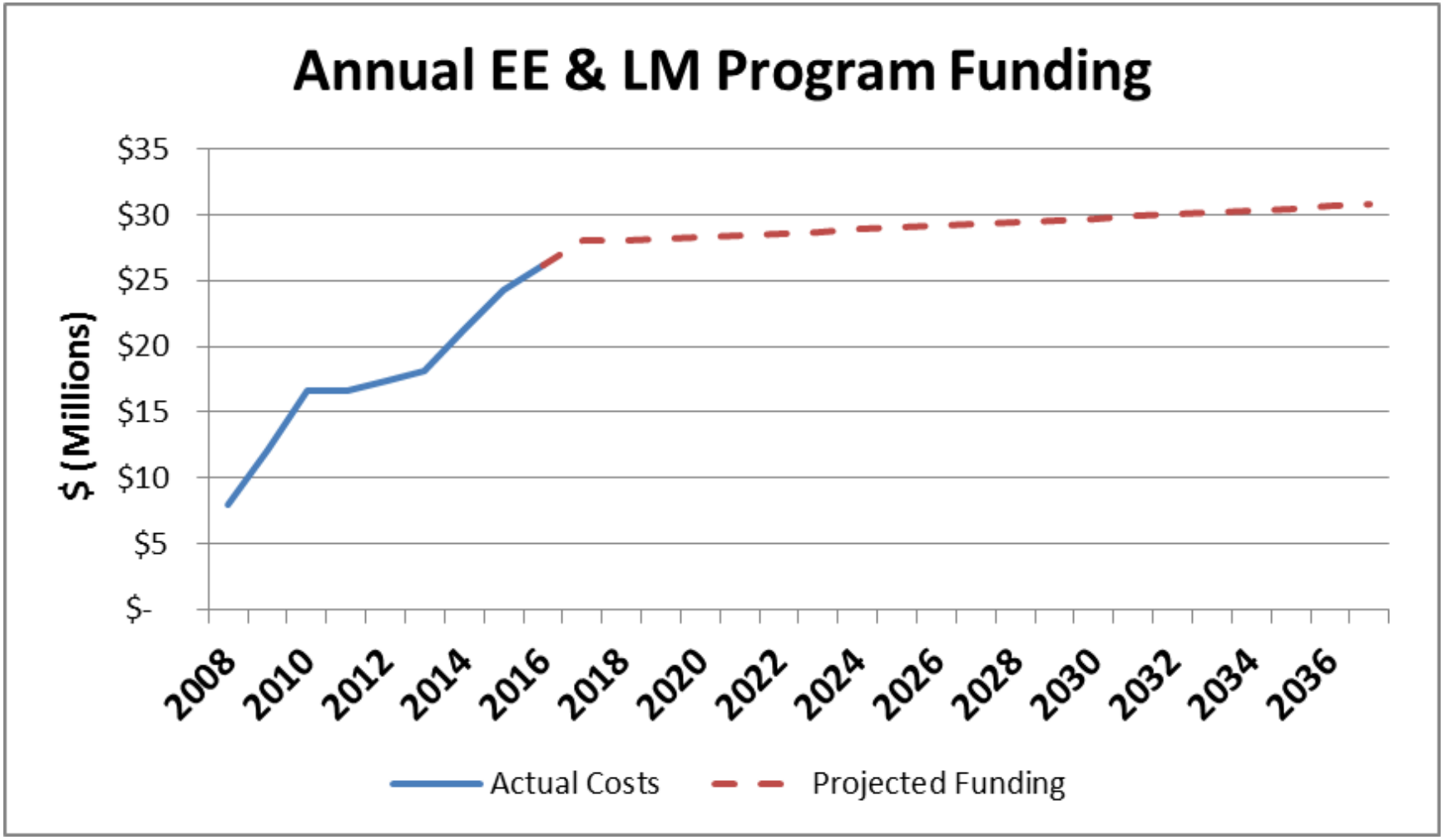
Energy Efficiency Forecast Assumptions

Total Portfolio Funding Assumptions

1. Forecast period aligned with IRP: 2019 – 2039
2. Funding level as defined by EUEA
   - 3-5% of retail revenues continues through forecast period
3. Projected 2020 funding based on latest EE/LM Plan filing
   - Filed April 2016
   - Based on approval of rates as filed in Case 15-00261-UT
   - Proposed budget = $28M
   - Actual budget to be adjusted per Final Order
4. Future EE/LM funding
   - Annual funding escalates at ½% beginning 2019

Energy Efficiency Forecast Assumptions

2017 IRP values, new forecast coming soon



Energy Efficiency Forecast Assumptions

Program Mix Assumptions

1. Existing EE programs
   - Individual forecasts over near term (4 to 6 years)
   - Effective useful life varies by program (historical average = 9 yr.)

2. Future EE programs
   - Generic – 50/50 split between residential/commercial programs
   - Forecast increased to match the EUEA goals by 2025

3. Load management programs (DR)
   - Individual programs forecasted through planning period

Energy Efficiency Forecast Assumptions

Program Cost Assumptions

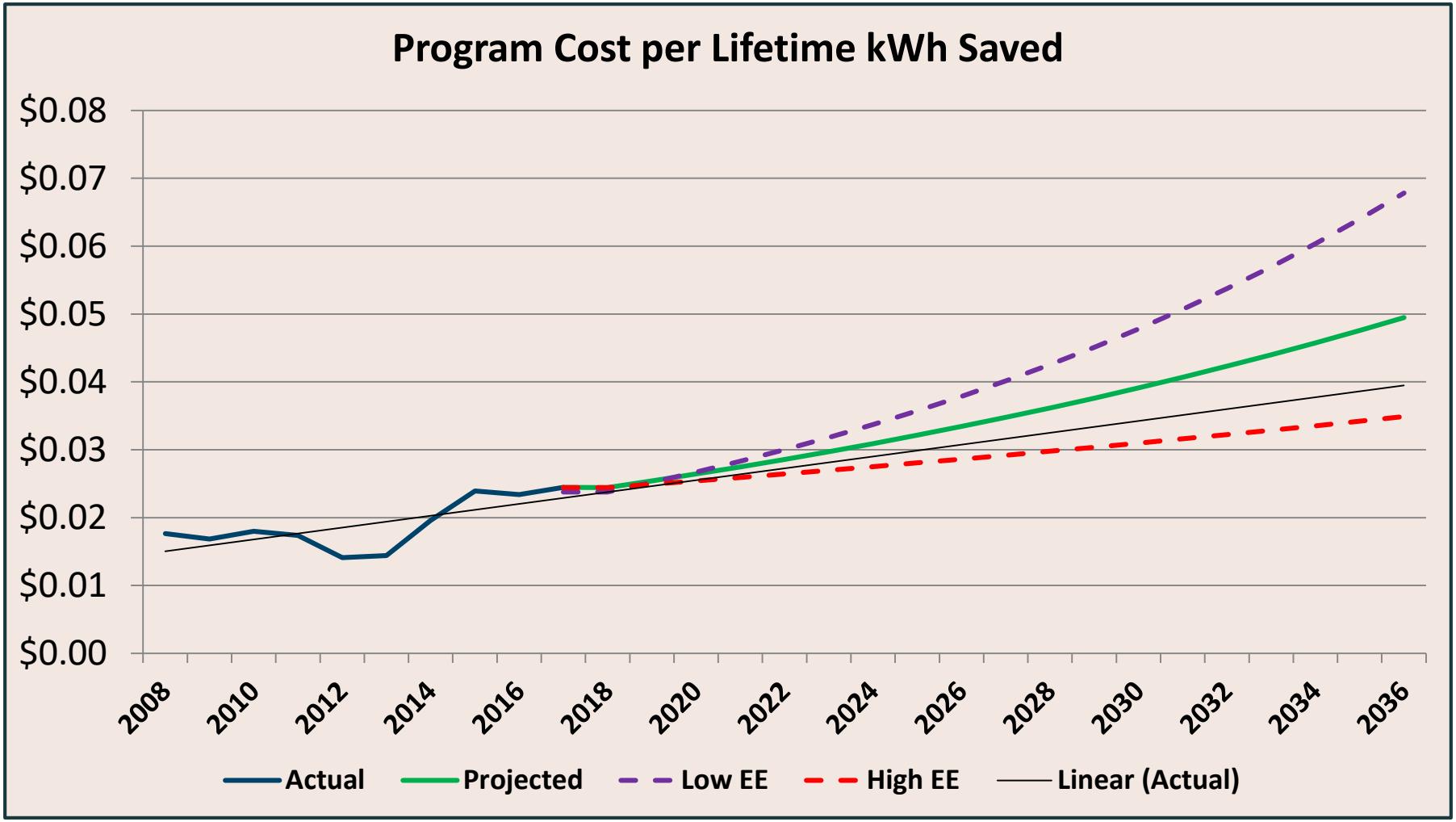
1. Program incentives and costs are increasing
   - Ratio of program cost per kWh saved is increasing
   - 2013 ($0.136/kWh) vs. 2018 ($.248/kWh) average escalation rate = 13%/yr.
   - Note: Costs were flat between 2017 and 2018

2. Base case escalation assumption – $/kWh saved
   - 4% beginning 2019

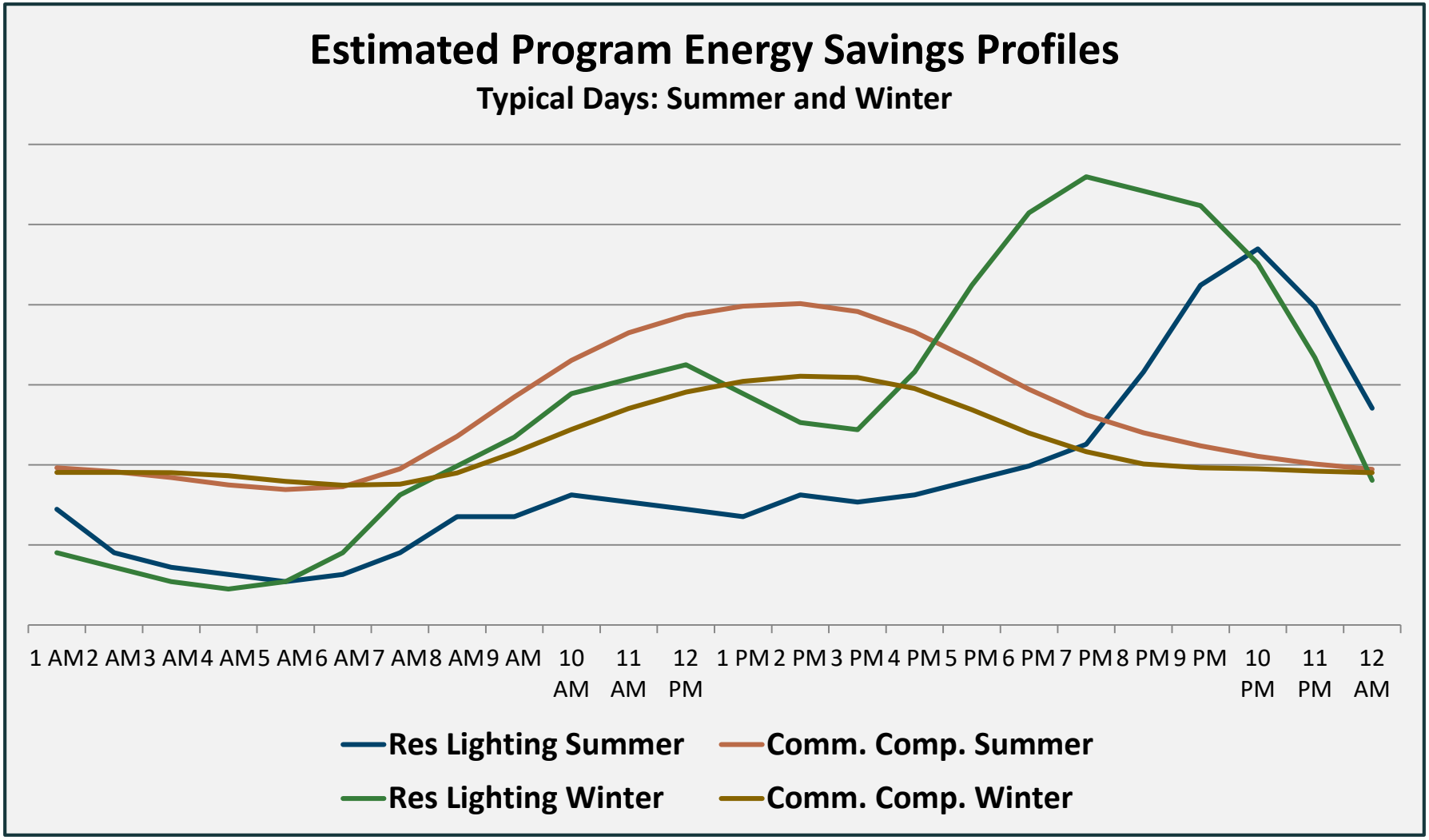
3. Higher savings sensitivity assumption
   - 2% escalation rate beginning in 2019
   - Lower escalation = more savings at given budget

Energy Efficiency Forecast Assumptions

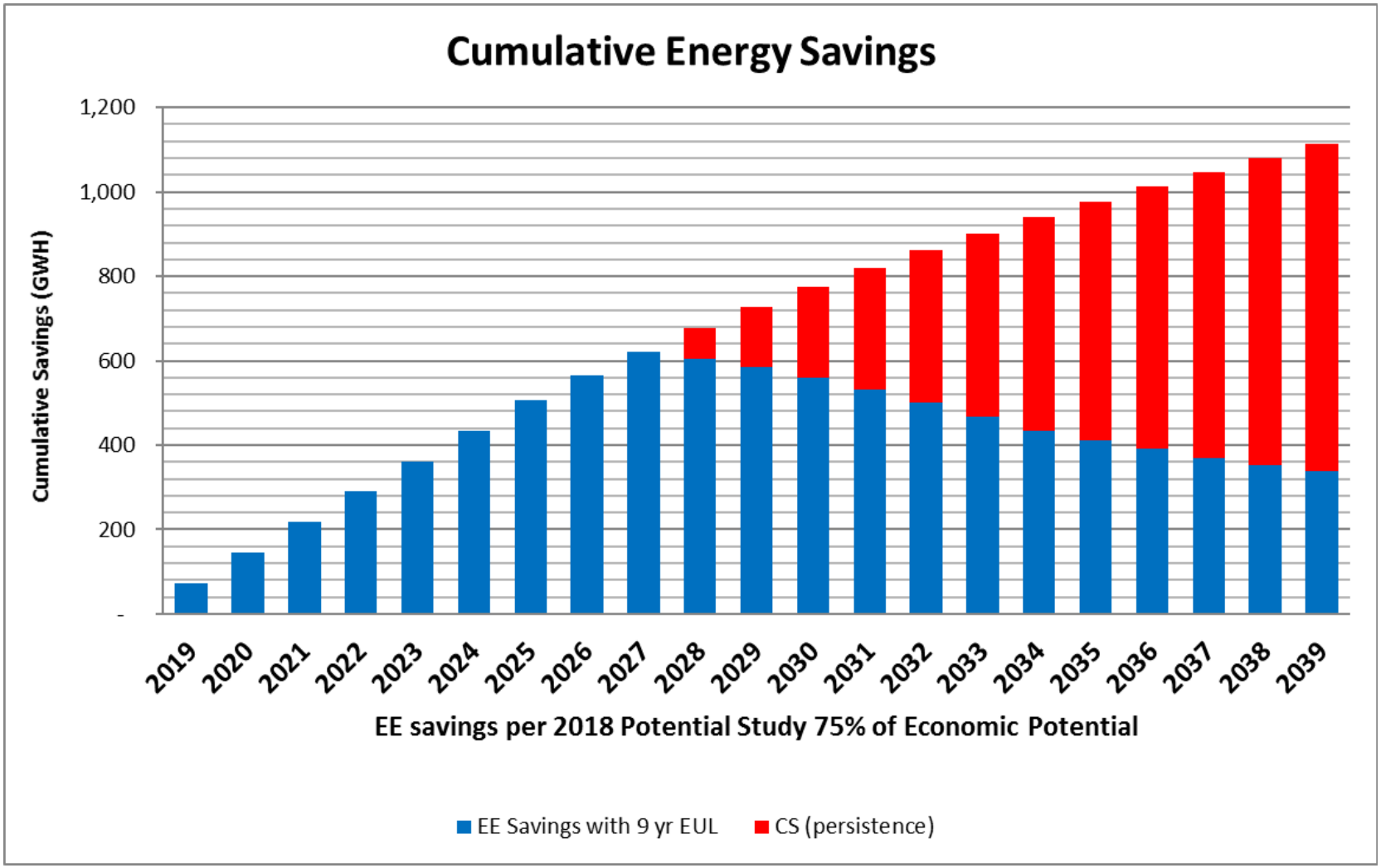
2017 IRP values, new forecast coming soon



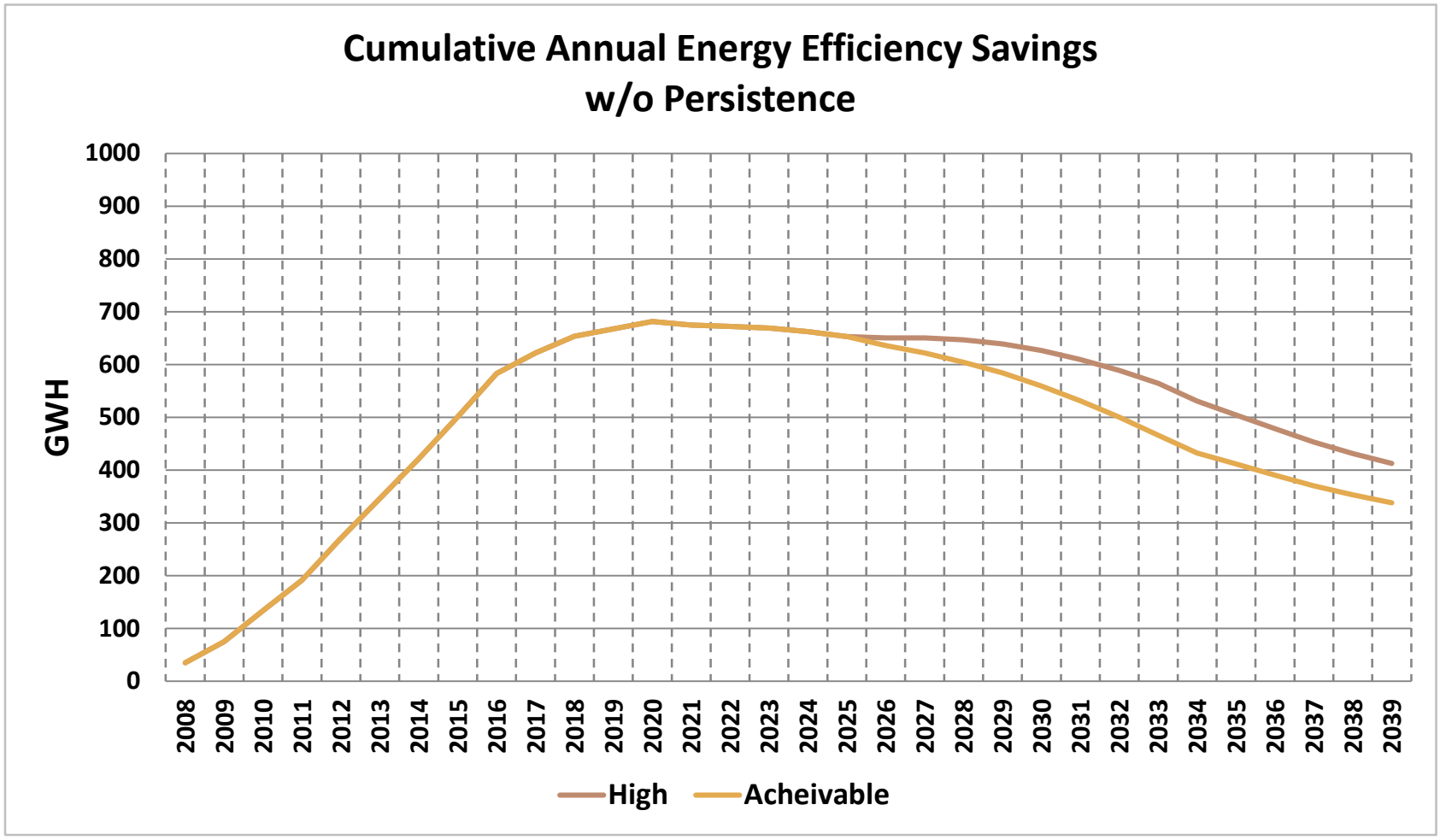
Energy Efficiency Forecast Assumptions



Energy Efficiency Forecast

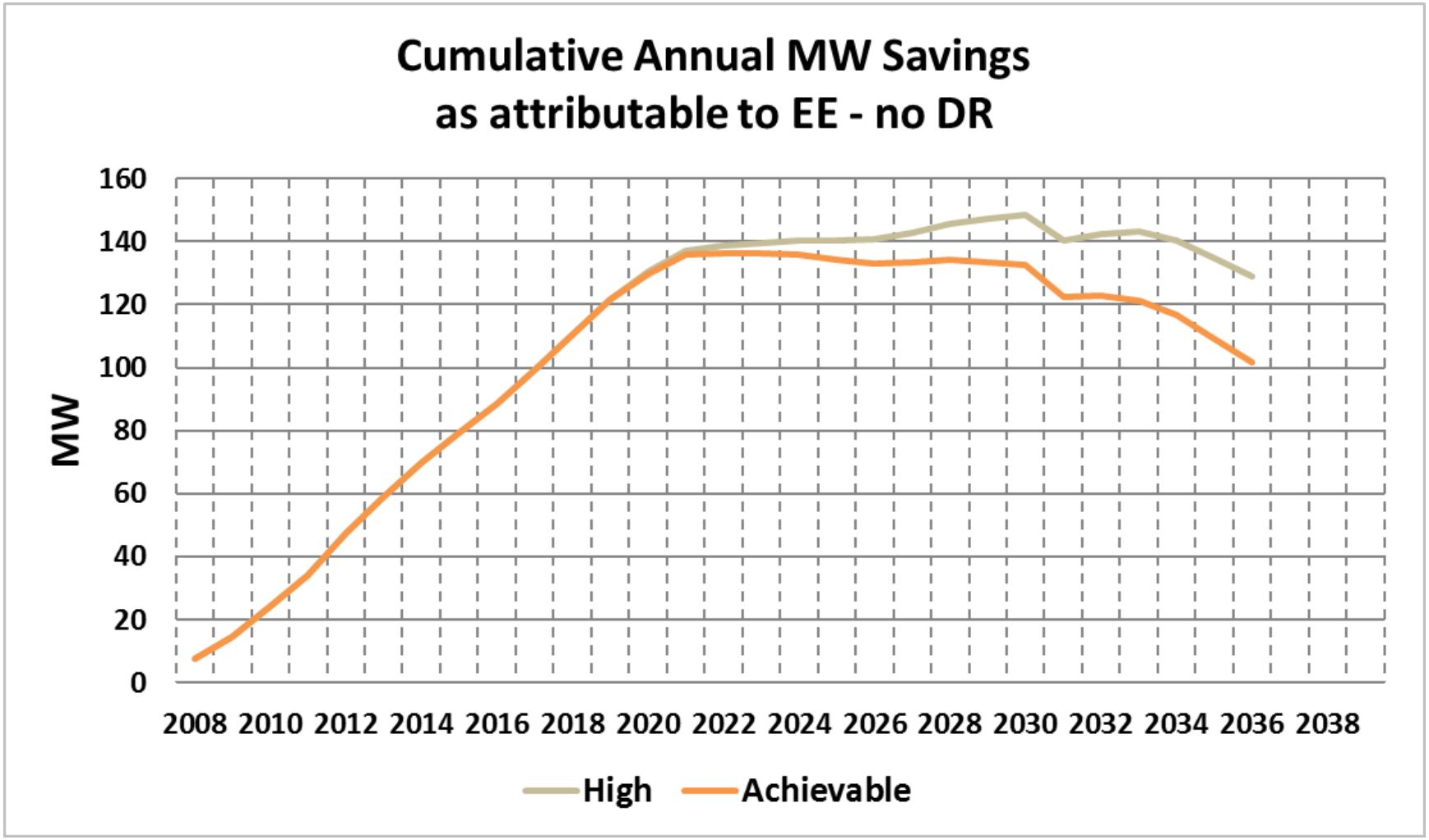


Energy Efficiency Forecast



High is Economic Potential, Achievable is assumed to be 75% of Economic Potential

Energy Efficiency Forecast

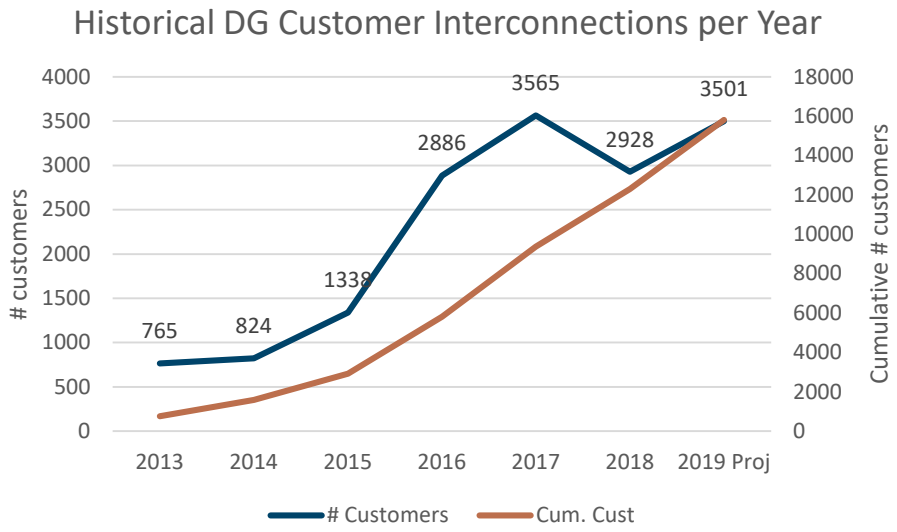


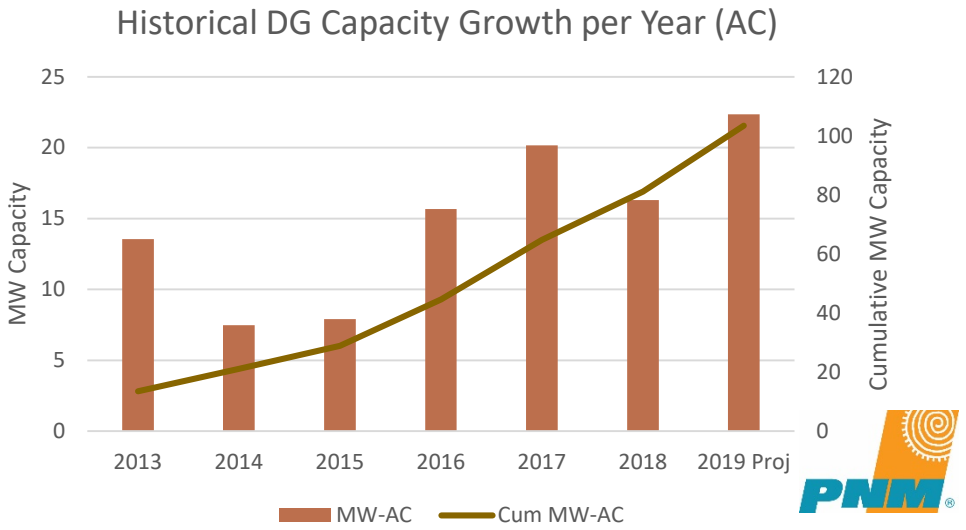
Distributed Generation (DG) Forecast

Kathleen Larese

Director of Customer Operations

Historical Distributed Generation (DG) Capacity & Interconnections



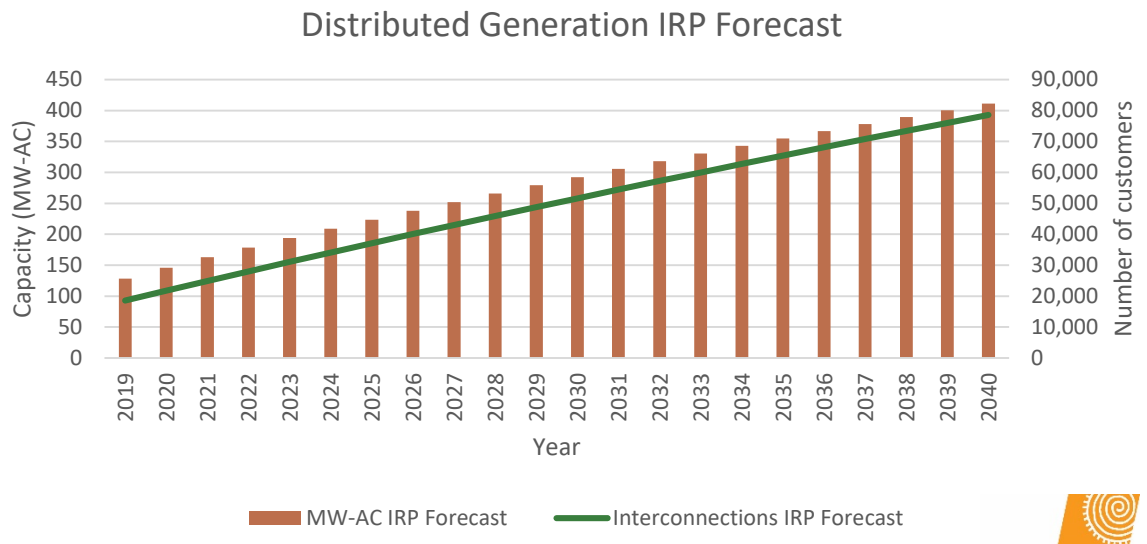


DG Forecast

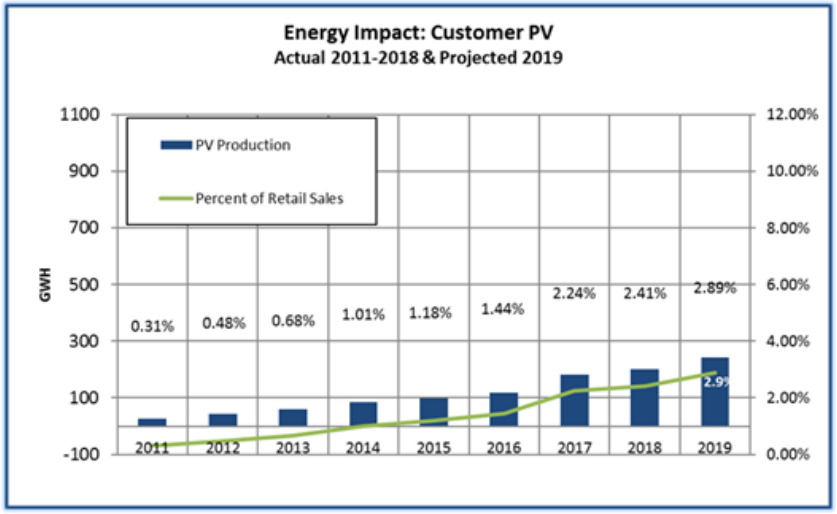
Year	MW-AC Forecast	Interconnections Forecast
2019	128	18,600
2020	146	21,789
2021	163	24,859
2022	179	27,974
2023	194	31,036
2024	209	34,056
2025	223	37,061
2026	238	40,029
2027	252	42,967
2028	266	45,878
2029	279	48,758
2030	292	51,610
2031	305	54,433
2032	318	57,228
2033	331	59,994
2034	343	62,733
2035	355	65,445
2036	367	68,129
2037	378	70,786
2038	389	73,417
2039	400	76,021
2040	411	78,599

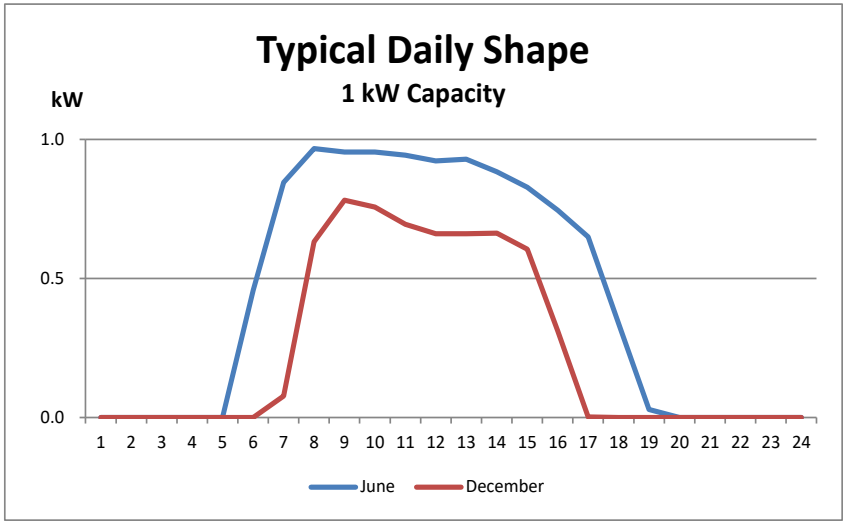
Assumptions

- 2020 Base Year calculated from 2017-2019 average capacity
- DC to AC conversion 0.78 based on actual DG applications
- 5% capacity growth decline in DG due to ITC elimination (2020-2022)
- 2% capacity growth decline in DG due to customer saturation (2023-2040)

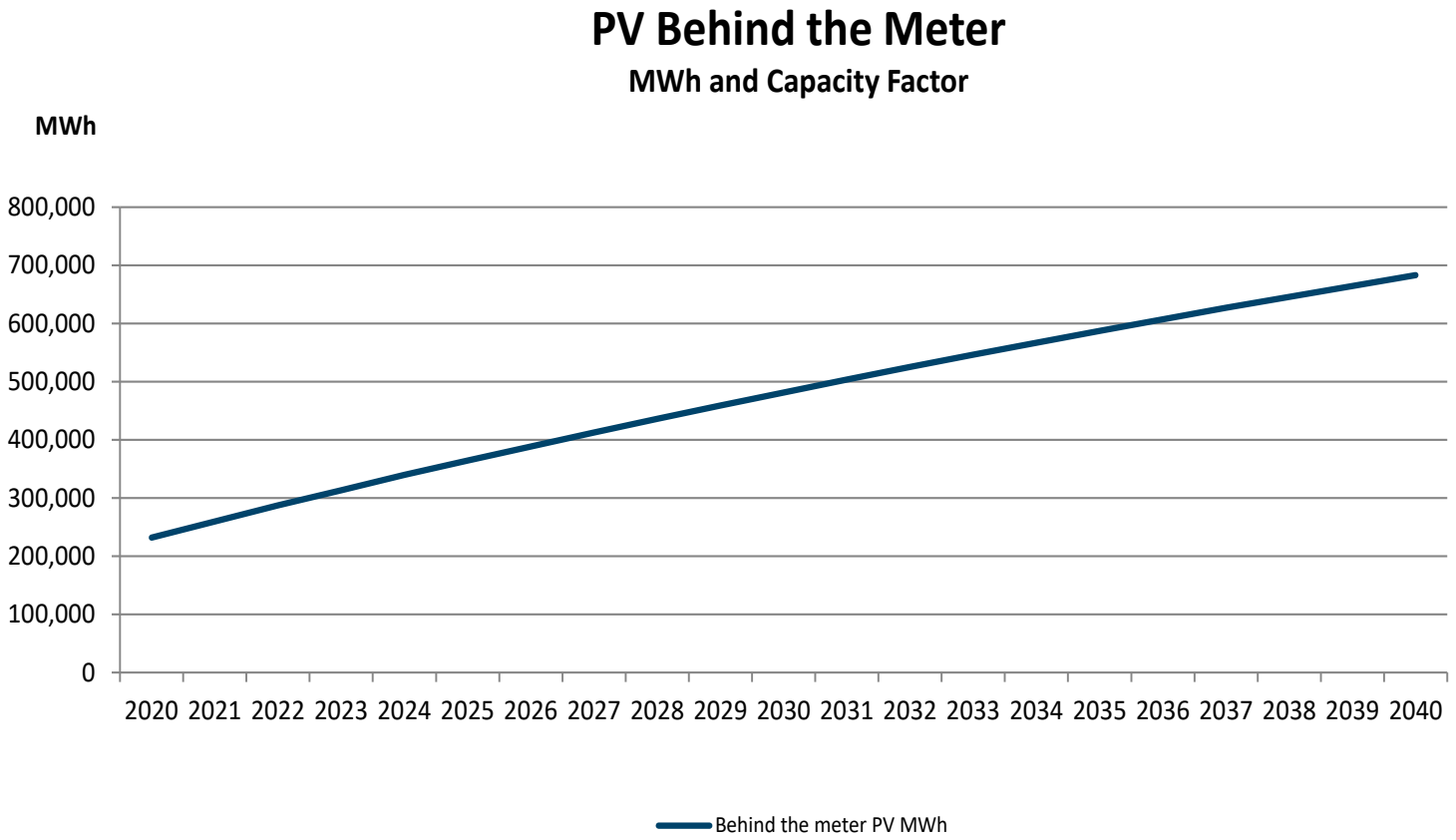


DG Energy Impact





Projected Energy with DG

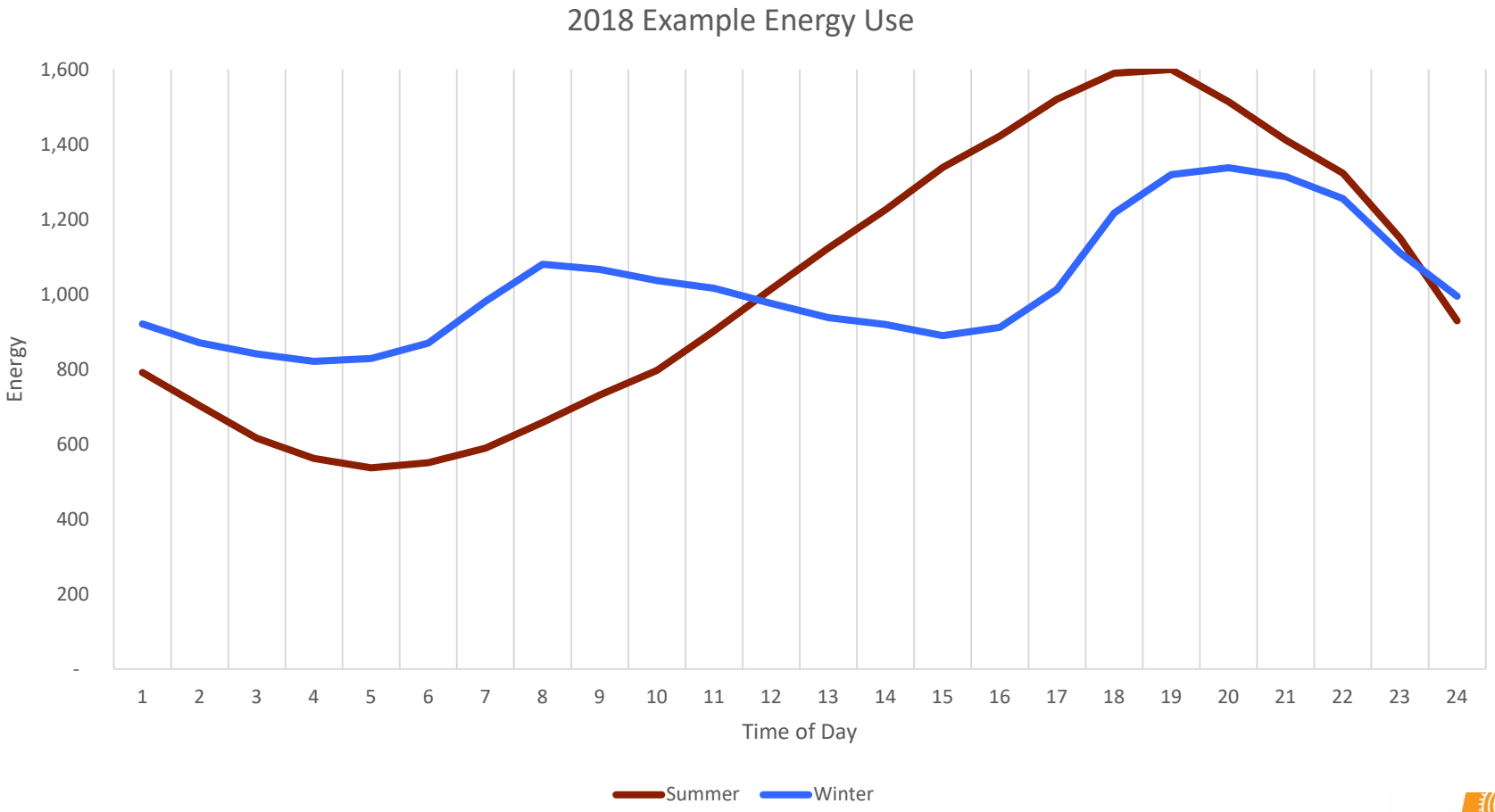


Time of Day Rates

Michael Settlage

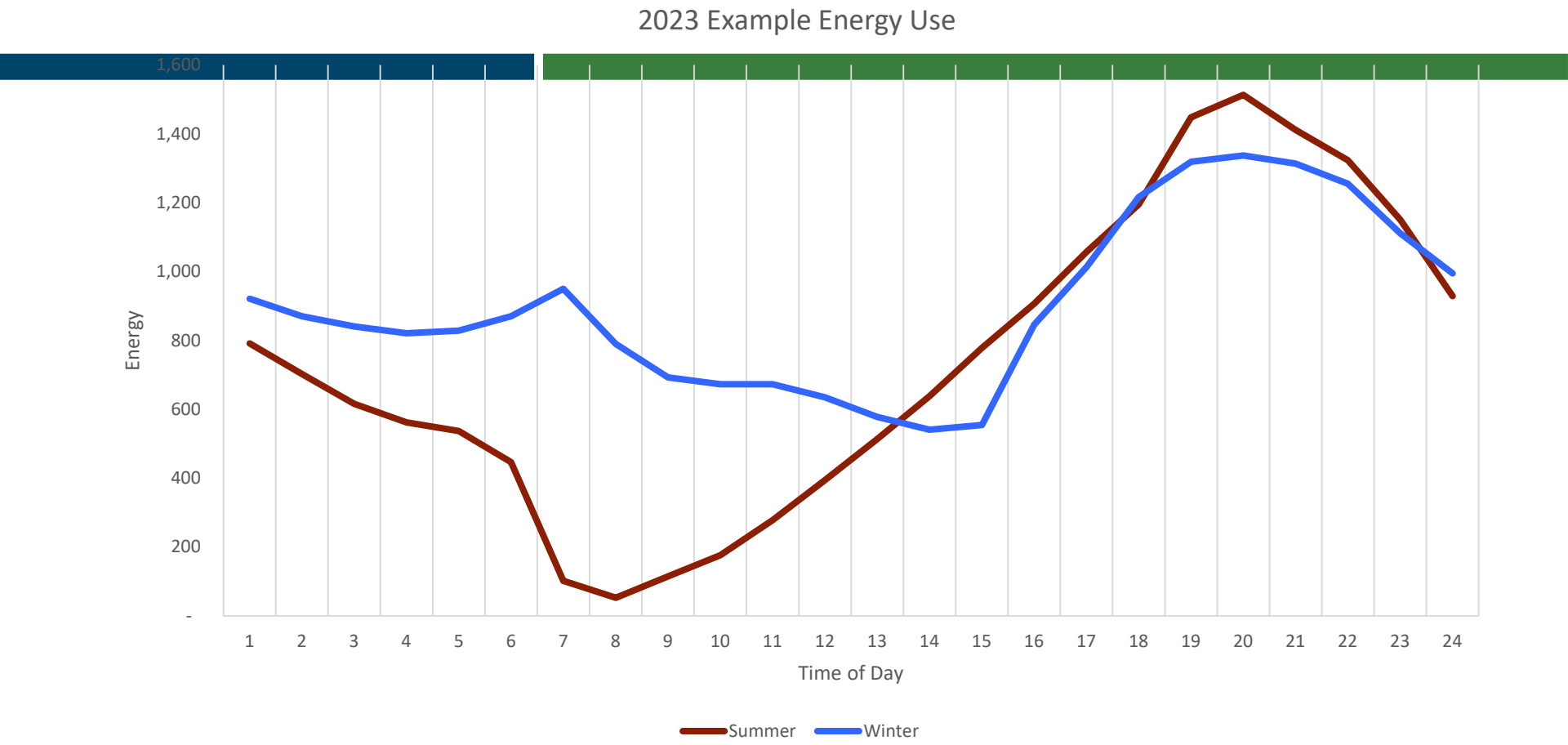
Lead Pricing Analyst

Energy Use during the day - Historical



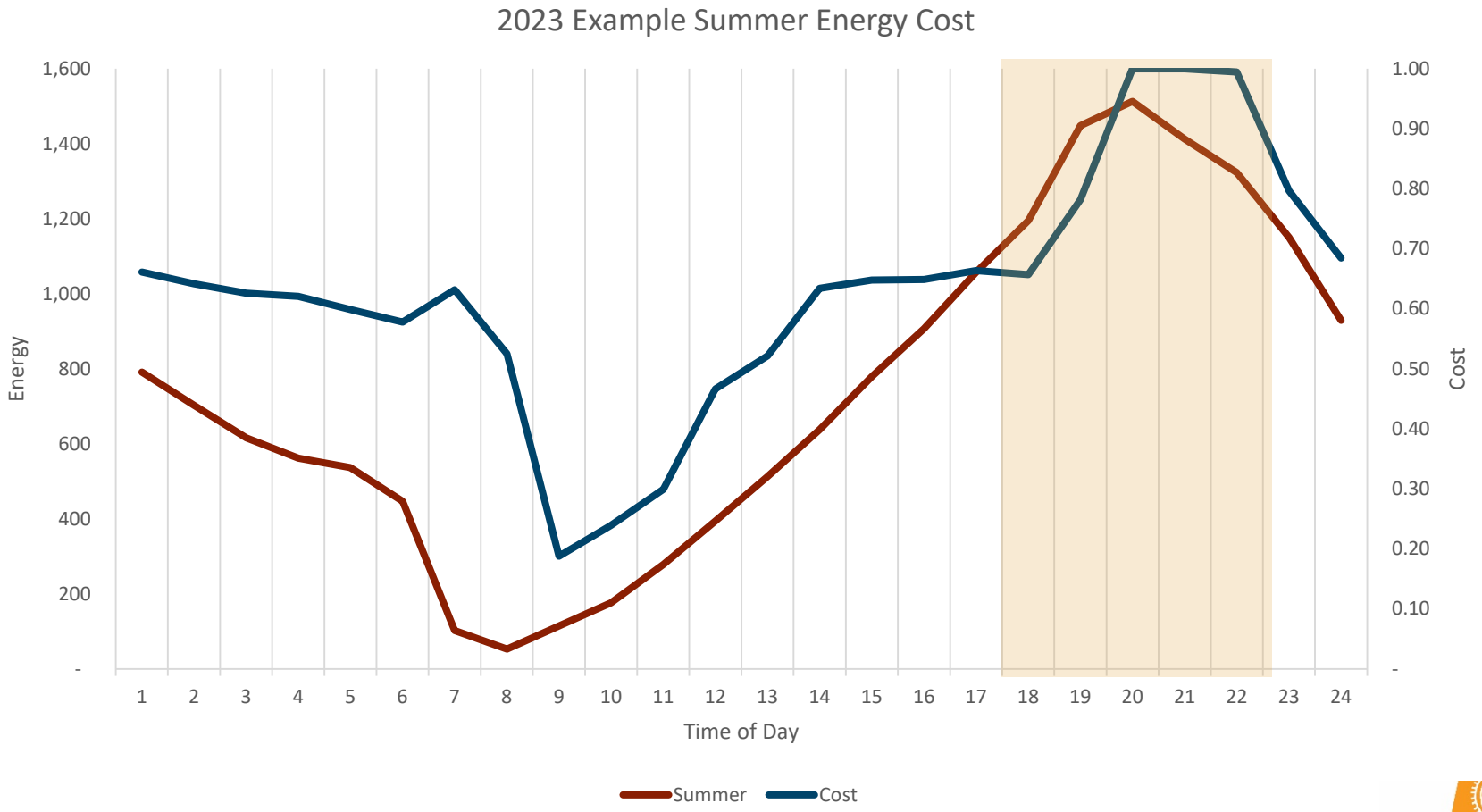
Historical energy use changed more gradually.

Energy Use during the day – Moving Forward



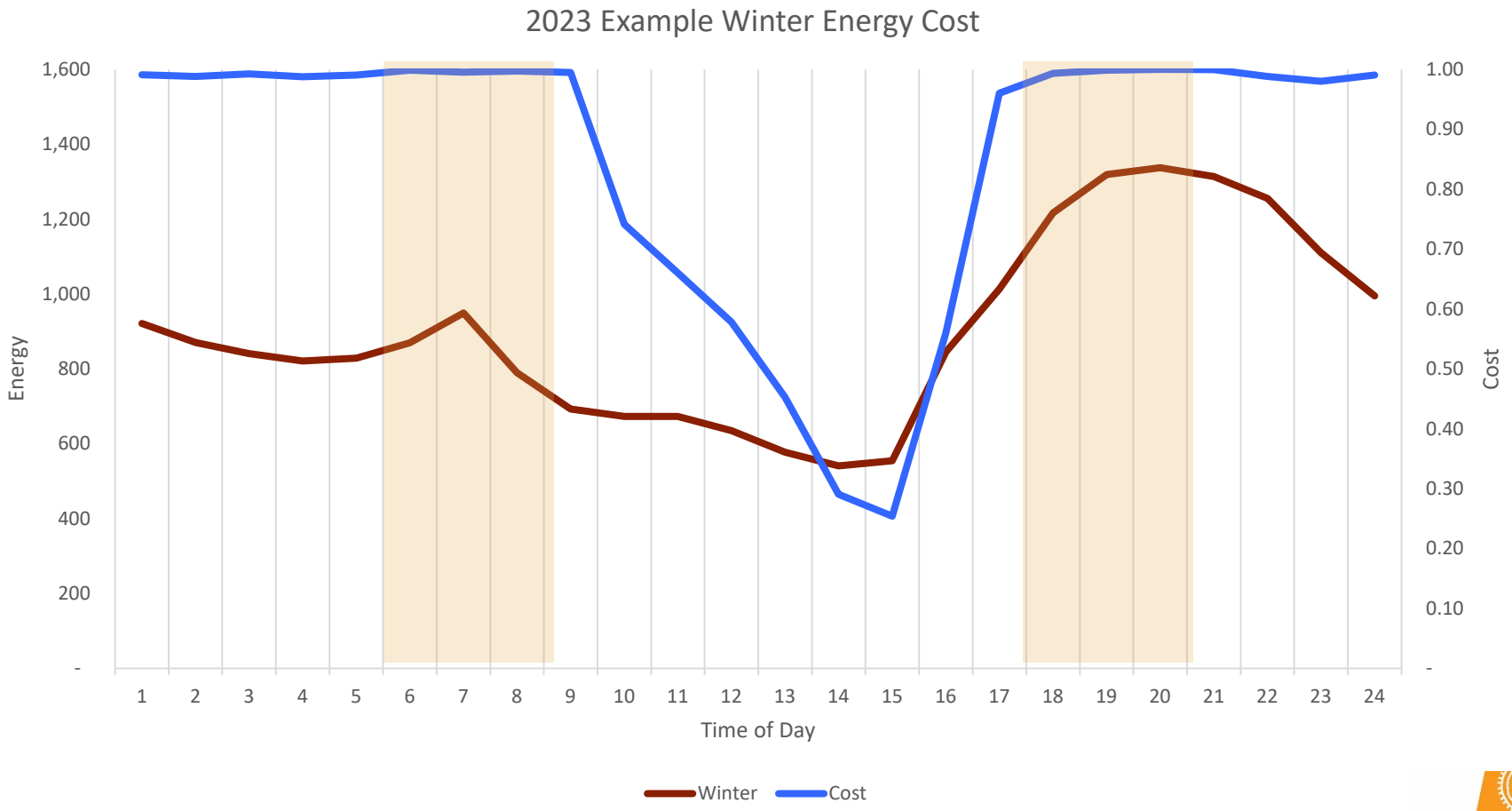
Future net energy use drops during the day due to customer solar.

Energy Cost during the day – Moving Forward



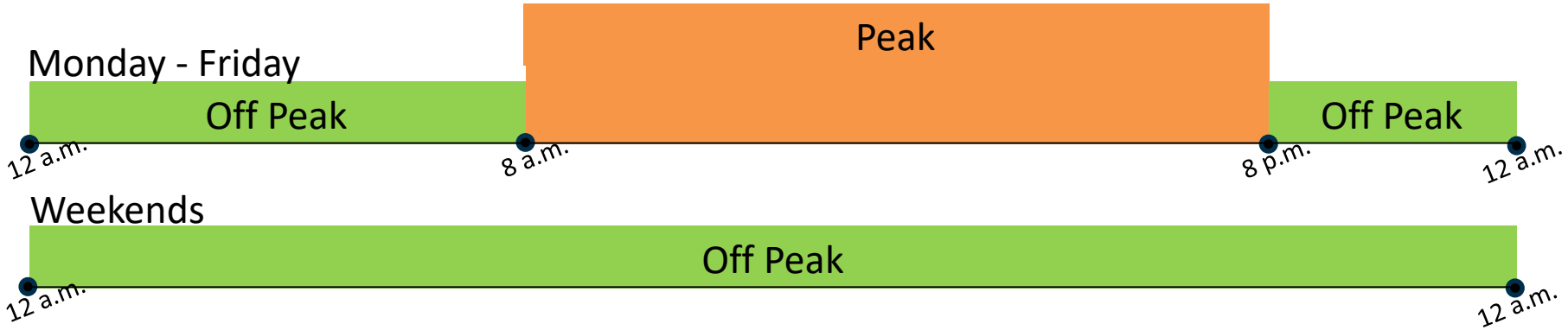
Future costs will be lowest during daylight hours.

Energy Cost during the day – Moving Forward



Future costs will be lowest during daylight hours.

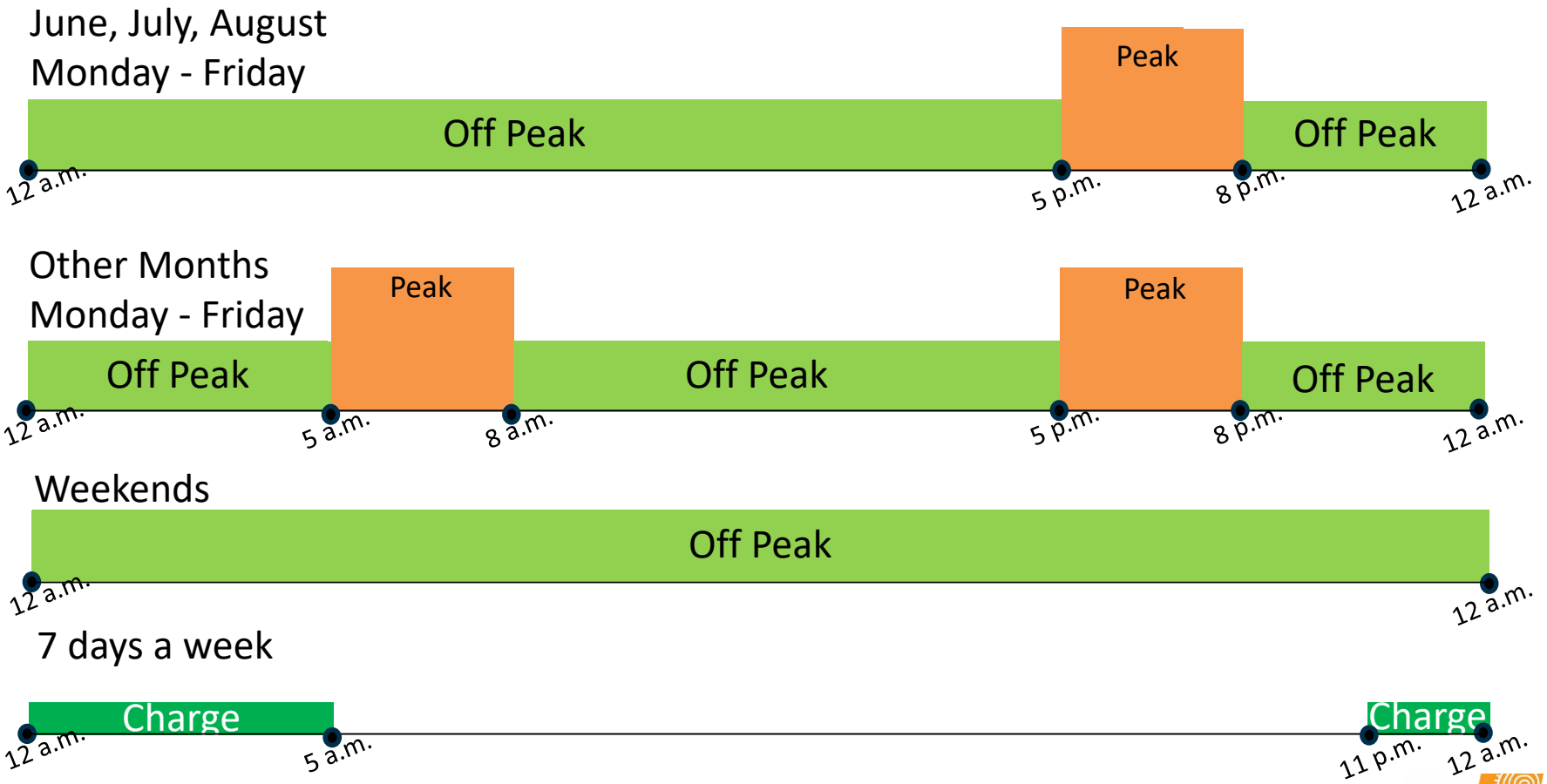
Time Of Use Pricing - Historical



Historical Time Of Use pricing doesn't reflect the cost of energy with renewables.

Time of Day Pricing – Moving Forward

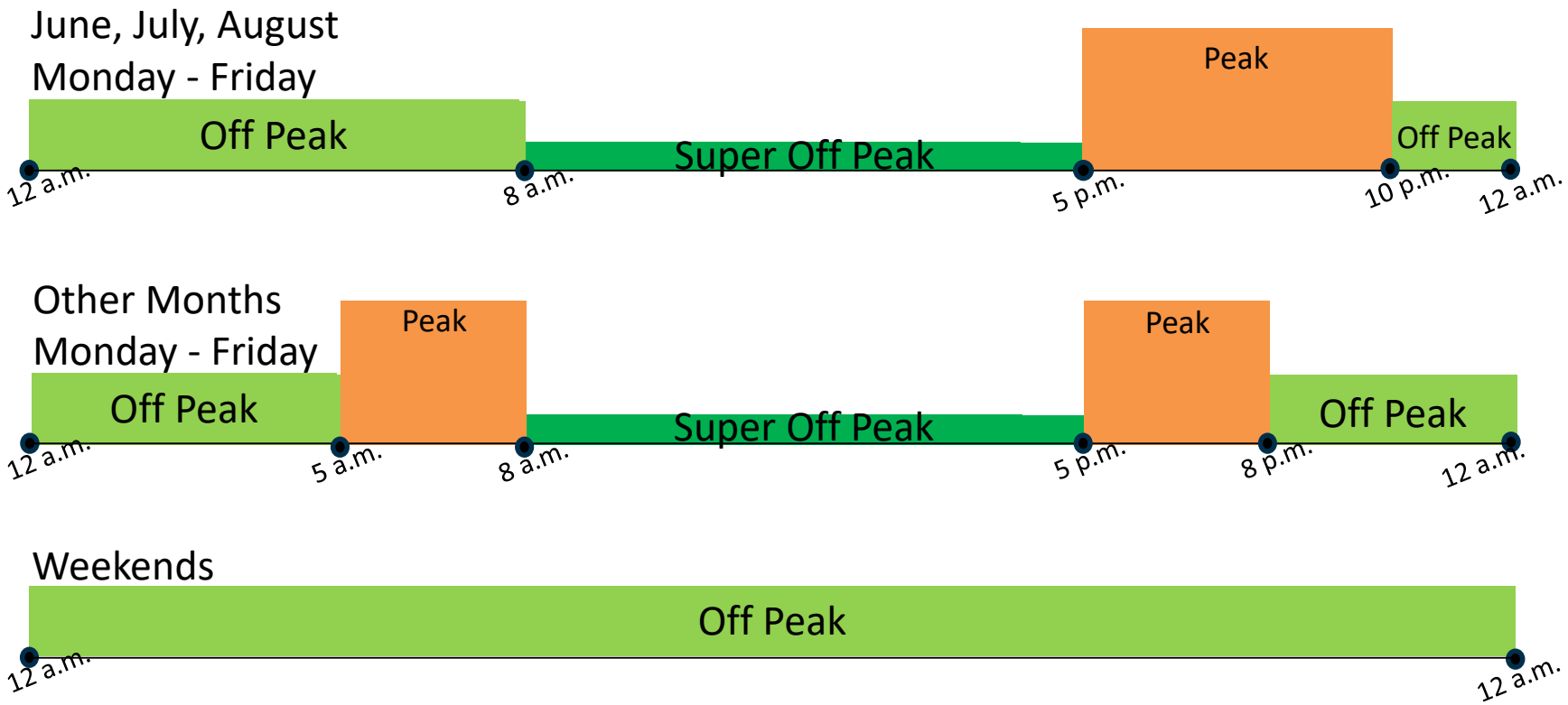
Residential and Electric Vehicle (EV) charging rates



Proposed Time Of Day rates balance customer convenience and energy cost.

Time of Day Pricing – Moving Forward

Non-residential Time Of Day rates



Proposed Time Of Day rates reflect energy cost and encourage smart energy use.

Audience Scenario Ideas

- Online Participants – please feel free to enter scenario suggestions in the Chat window. They will be read out loud and capture.
- In-Person Participants – please utilize the flipcharts that are available to write up your scenario suggestions and discuss when called upon

Tentative Meeting Schedule Through May 2020

July 31:	Kickoff, Overview and Timeline
August 20:	The Energy Transition Act & Utilities 101
August 29:	Resource Planning Overview: Models, Inputs & Assumptions
September 6:	Transmission & Reliability (Real World Operations)
September 24:	Resource Planning “2.0”
October 22:	Demand Side/EE/Time of Day
November 19:	Load & CO2 Forecast*
December 10:	Initial Scenarios**
January 14:	Technology Review / Finalize scenarios**
March 10, 2020:	Process Update
April 14, 2020:	Process Update/Public Draft
May 12, 2020:	Advisory Group Comments

*NOTE: Date Change

** NOTE: Topic Change

Registration for Upcoming Sessions

Please register for each upcoming session separately. You will receive a reminders two days in advance and the day of the event.

To access documentation presented so far and to obtain registration links for upcoming sessions, go to:

www.pnm.com/irp

Other contact information:

irp@pnm.com for e-mails

THANK YOU