



# Conservation Potential Update

2021 IRP Public Input Meeting – Technical Workshop  
August 28, 2020



# Agenda



August 28, 2020

- Introductions
- 2021 CPA Process Review
- Energy Efficiency Potential – Draft Results
- Demand Response Potential – Draft Results
- Wrap-Up/ Next Steps



# 2021 CPA Process Review



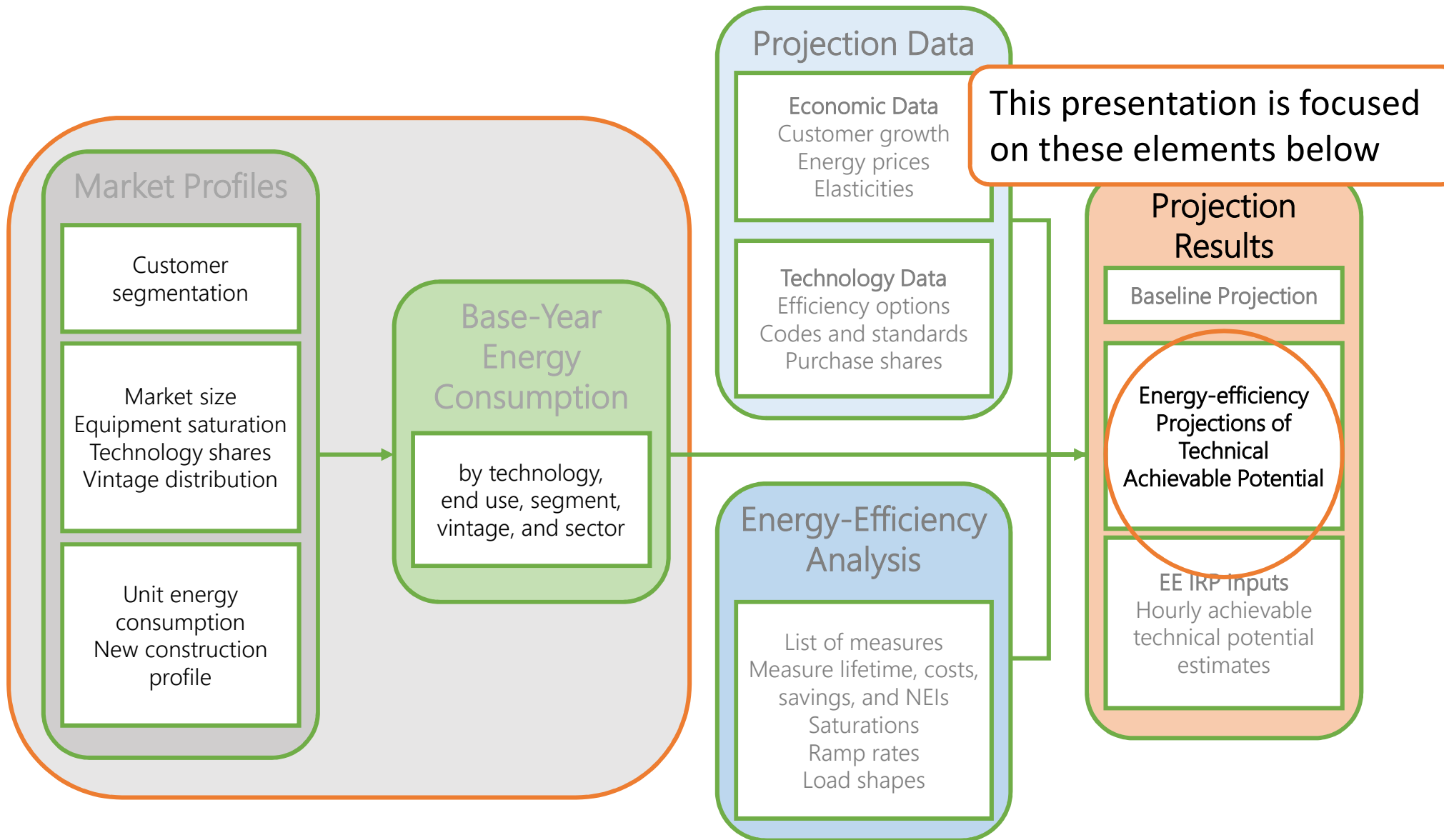
# CPA Stakeholder Process To-Date



- **December 2019:** [Draft CPA Work Plan](#) provided to stakeholders for review and comment
- **January 2020:** [CPA Workshop #1](#). CPA overview and planned changes from 2019 CPA.
  - Study methodology
  - EE source data hierarchy
- **February 2020:** [Draft Resource List](#), [CPA Workshop #2](#).
  - Major measures identification
  - Baseline development, regional and state variation
  - Savings and cost variation drivers
- **April 2020:** [Draft Measure List](#), [CPA Workshop #3](#).
  - Technical drivers of differences between states
  - Load and potential differences
  - Market profiles, incentive and administrative costs posted
- **August 2020:** Presentation of Draft Results



# CPA Methodology (Except OR)





# Energy Efficiency Draft Results



# 2021 CPA Analysis Themes



## CPA Forecasting is Dynamic

- CPA forecasting is dynamic and markets change quickly
- Analysis every two years to capture these changes

## Lighting Changes

- LED adoption has been significant since the last CPA
- EISA 2020 & Market baseline assumptions

## Ramp Rates

- Refresh of ramp rates to NWPCC 2021 Plan assumptions
- Adjusted ramp rates by state based on participation analysis

## State Specificity

- Regional measure and market data sourcing
- State specific codes, standards and lighting assumptions



# Energy Efficiency Drivers of Change



# Key Changes Relative to the 2019 CPA

| Change Area                | Detail   |
|----------------------------|--|
| State-Specific Adjustments | RMP and PP specific measure* and market data sourcing                    |
|                            | Updated residential survey and load forecast data by state               |
|                            | Major market profile data sourcing overhaul                              |
|                            | Codes & Standards  |
| Forecasting Methodology    | Ramp Rates – Refreshed to 2021 Plan and participation analysis results   |
|                            | Treatment of equipment measures for technical potential                  |
|                            | Max achievability (some measures above 85%)                              |
|                            | No Streetlighting Model – market is transformed in the Load Forecast     |
|                            | Residential Low Income segments added for WA                             |
| Other                      | Lighting savings methods (market baseline and EISA)                      |
|                            | Other updated secondary sources (AEO purchase shares and trends)         |
|                            | New emerging technologies (higher SEER AC, more HP Dryer options)        |
|                            | Applicability and Saturation Sourcing Updates (RBSA II, CBSA, 2021 Plan) |
|                            | Incremental HERs for all states, including OR***                         |

\* State-specific measure adjustments are for weather-dependent and major measures only

\*\* Ramp Rates were refreshed based on the 2021 Power Plan then adjusted based on the Participation Analysis

\*\*\* Incremental HERs to existing program savings are still being finalized and will be included in the final results

# State Specific Adjustments



- Region Specific Measure Sourcing
- Updated load research and savings from PacifiCorp
- WA: Residential Low Income rate
- Codes and Standards:
  - WA: Adheres to HB1444
  - CA: Title 24
  - Federal Codes & Standards included
- Oregon results will change with savings before final results in October

## State Specific Measure Sourcing

|         |   |
|---------|---|
| WA & ID | 1) RTF UES Measures<br>2) 2021 Power Plan<br>3) Idaho Power TRM<br>4) Other                   |
| UT & WY | 1) Rocky Mt. Power Measures*<br>2) Xcel Energy CO TRM<br>3) RTF with Adjustments†<br>4) Other |
| CA      | 1) Non-DEER Workpapers<br>2) DEER<br>3) RTF with Adjustments†<br>4) Other                     |
| OR      | 1) ETO Measure Approval Documents<br>2) RTF UES Measures<br>3) 2021 Plan<br>4) Other          |

# Lighting Baselines and EISA 2020 by State



- The 2019 CPA utilized a **frozen efficiency baseline** and **accounted for impacts of the EISA 2020 45 lumen/Watt Backstop Provision**
- Since that time:
  - US DOE rolled back the 2020 backstop provision
  - Washington HB 1444 codified the 45 lm/W standard for bulbs sold in the state
  - California lighting measures were aligned to the approved statewide work papers in DEER.
- The 2021 CPA incorporates current state-specific standards and requirements for screw-in lighting standards and RTF market baselines where applicable

| State      | Lighting Baseline Condition Modeled | EISA 2020 Standard Included? |
|------------|-------------------------------------|------------------------------|
| California | 100% LED Baseline                   | In 2019                      |
| Idaho      | RTF Market Baseline                 | Not Included                 |
| Utah       | 2018 Frozen Baseline                | Not Included                 |
| Washington | RTF Market Baseline                 | In 2020                      |
| Wyoming    | 2018 Frozen Baseline                | Not Included                 |
| Oregon     | RTF Market Baseline                 | Not Included                 |

# Commercial Lighting Differences by State

- Commercial LPDs were updated to better align with 2021 Power Plan LPDs and be as regionally specific as possible
  - WA, CA & OR utilized the 2021 Plan LPDs outright
    - OR utilized the 7<sup>th</sup> plan baseline with saturation adjustments in the 2019 CPA
  - UT and ID utilize an average of CBSA 2014 and 2021 Plan – *About 15% higher*
  - WY utilizes CBSA 2014 outright – *About 30% higher*

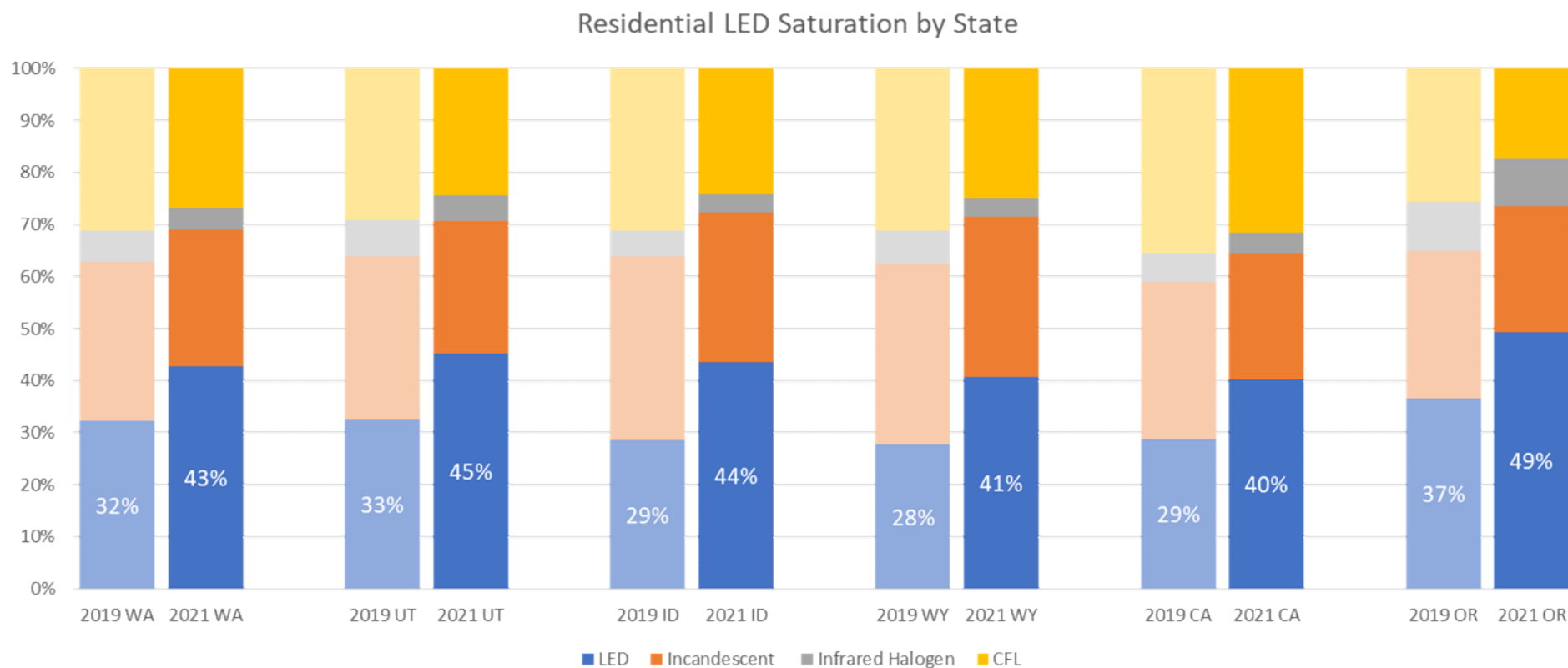
Commercial Lighting Baseline LPD Comparison by State (Watts/1000 SqFt)

| CPA Year              | State               | Large Office | Small Retail | Warehouse | School | Lodging | Misc. |
|-----------------------|---------------------|--------------|--------------|-----------|--------|---------|-------|
| 2019 CPA Baseline LPD | All States (ex. OR) | 1,399        | 1,193        | 772       | 988    | 993     | 885   |
|                       | California          | 801          | 872          | 454       | 771    | 552     | 693   |
|                       | % Difference        | -43%         | -27%         | -41%      | -22%   | -44%    | -22%  |
|                       | Idaho               | 901          | 1,006        | 541       | 846    | 677     | 776   |
|                       | % Difference        | -36%         | -16%         | -30%      | -14%   | -32%    | -12%  |
|                       | Utah                | 901          | 1,006        | 541       | 846    | 677     | 693   |
| 2021 CPA Baseline LPD | % Difference        | -36%         | -16%         | -30%      | -14%   | -32%    | -22%  |
|                       | Washington          | 801          | 872          | 454       | 771    | 552     | 693   |
|                       | % Difference        | -43%         | -27%         | -41%      | -22%   | -44%    | -22%  |
|                       | Wyoming             | 1,002        | 1,140        | 629       | 921    | 801     | 859   |
|                       | % Difference        | -28%         | -4%          | -18%      | -7%    | -19%    | -3%   |
|                       |                     |              |              |           |        |         |       |
| Oregon                | 2019 CPA Baseline   | 970          | 1,016        | 495       | 885    | 736     | 855   |
|                       | 2021 CPA Baseline   | 801          | 872          | 454       | 771    | 552     | 693   |
|                       | % Difference        | -17%         | -14%         | -8%       | -13%   | -25%    | -19%  |

# And LED Residential Lighting Shares are Increasing



- PacifiCorp residential customer surveys suggested a 10-15% increase in LED saturation over the past two years



Source: Internal PacifiCorp Survey Data

# Forecasting Methodology Changes

- C&I Lighting
  - Updated stock turnover model to force more turnover in early years
    - Accounts for the fact that retrofits of additional fixtures often happen when fixtures burn out.
  - Aligns with DOE SSL Methodology
- Max Achievability
  - NWPCC 2021 Plan allows some measures max achievability to reach up to 100% of technical potential
  - 7th Power Plan and 2019 CPA had a max achievability of 85%
  - AEG has aligned assumptions with the 2021 Plan and measures such as lighting reach greater than 85%
  - Oregon follows this methodology as well
- No Streetlighting model in this CPA
  - Market becomes 100% LED in the Load Forecast
  - Transformation happens quickly for most states (by 2030)

Measures examples over 85% Achievability:

- All Lighting
- Washers/Dryers
- Dishwashers
- Refrigerators/Freezers
- Circulation Pumps
- Thermostats
- C&I Fans

# Other Notable CPA Changes



- Large UT Res increase
- COVID-19 Impacts
- EVs and Electrification

## Load Forecast

- Market Profile Sourcing Updates
- EIA Annual Energy Outlook 2019

## Secondary Source Updates

## Emerging Techs

- New Emerging Technologies
- More Efficient Options (HP Dryer UCEF 8.0, SEER 24 AC)

## Applicability & Saturation Updates

- NWPCC 2021 Power Plan
- RBSA II / CBSA 2014
- Expand sourcing for UT and WY



# State-Level Administrative, Incentive & Participation Analysis Results



# Administrative Cost Analysis



| 2021 CPA Administrative Cost as Percent of Incremental Customer Costs |     |     |     |     |     |     |                                |
|---|-----|-----|-----|-----|-----|-----|--------------------------------|
| Program Year  | UT  | WA  | CA  | ID  | WY  | OR  | Notes                          |
| 2014  | 17% | 34% | 54% | 60% | 49% | n/a |                                |
| 2015  | 19% | 34% | 35% | 36% | 41% | n/a |                                |
| 2016  | 19% | 37% | 48% | 36% | 27% | n/a |                                |
| 2017  | 22% | 45% | 83% | 44% | 37% | n/a |                                |
| 2018  | 24% | 43% | 67% | 64% | 43% | n/a |                                |
| 5-year Average to Utilize   | 20% | 38% | 54% | 46% | 37% | 28% | OR based on 2019 Program Data* |

| 2019 CPA Administrative Cost as Percent of Incremental Customer Costs |     |     |     |     |     |     |  |
|---|-----|-----|-----|-----|-----|-----|--|
| Program Year  | UT  | WA  | CA  | ID  | WY  | OR  | Notes                                    |
| 2014  | 17% | 34% | 54% | n/a | n/a | n/a | Excluded ID & WY as outliers in 2019 CPA |
| 2015  | 19% | 34% | 35% | 36% | n/a | n/a | Excluded WY as outlier in 2019 CPA       |
| 2016  | 19% | 37% | 48% | 36% | 27% | n/a |  |
| Utilized 3-year average   | 18% | 35% | 44% | 36% | 27% | 20% | OR utilized 7th Plan assump. in 2019 CPA |

| 2019 CPA to 2021 CPA Administrative Cost % of Customer Cost Comparison |     |     |     |     |     |     |  |
|--|-----|-----|-----|-----|-----|-----|--|
| CPA Year   | UT  | WA  | CA  | ID  | WY  | OR  | Notes  |
| 2019 CPA   | 18% | 35% | 44% | 36% | 27% | 20% | ID & WY identified as outliers in some years |
| 2021 CPA   | 20% | 38% | 54% | 46% | 37% | 28% | Include all years in 2021 CPA                |
| % Change from 2019 CPA   | 10% | 10% | 21% | 27% | 36% | 40% |  |

\* 2019 Program Data not available in time for analysis for all other states



# Incentive Cost Analysis

- First time this analysis has been performed in the CPA process
- Affects UT and ID, which utilize the UCT as the primary cost-effectiveness criterion, rather than TRC

| 2021 CPA Incentive Cost as Percent of Incremental Customer Costs |     |     |     |     |     |       |
|--|-----|-----|-----|-----|-----|-------|
| Program Year   | UT  | WA  | CA  | ID  | WY  | Notes |
| 2014   | 41% | 41% | 33% | 45% | 35% |       |
| 2015   | 40% | 42% | 32% | 41% | 47% |       |
| 2016   | 33% | 44% | 29% | 39% | 28% |       |
| 2017   | 38% | 39% | 35% | 44% | 40% |       |
| 2018   | 37% | 44% | 38% | 46% | 52% |       |
| 5-year Average to Utilize  | 38% | 42% | 33% | 43% | 40% |       |

## 2019 CPA Incentive Cost as Percent of Incremental Customer Costs

This incentive analysis was not part of the 2019 CPA.

The 2019 CPA utilized 70% of customer incremental cost for all states and all measures except Non-Res Lighting, which utilized 50%.

# Participation Analysis Overview



Utilized the 2017/2018 annual report cost-effectiveness workbooks at the measure level to estimate participation for all states except OR, which has its own participation calibration

Compared kWh savings from the annual to the 2019 CPA technical potential at the measure category level

Informs ramp rates and beginning saturations of potential – akin to Energy Trust’s program forecast calibration, but looking at program history

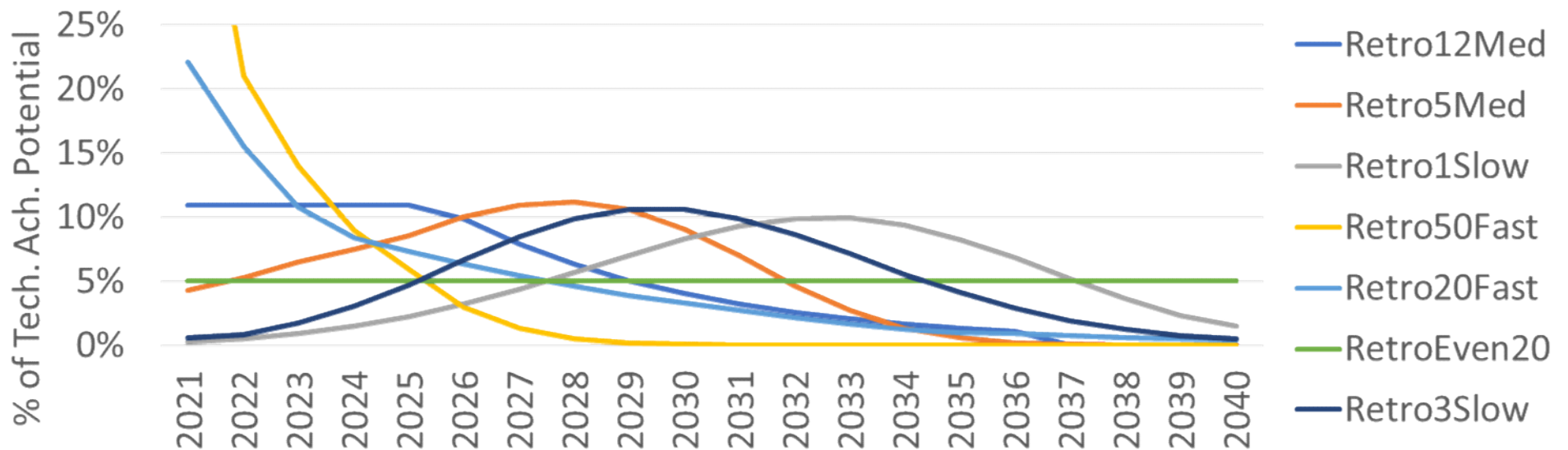
Results for all states except OR were used to determine which Ramp Rate from the NWPCC 2021 Power Plan is most appropriate for the analysis. This did not create new Ramp Rates

Several Ramp Rates were adjusted from the 2021 Power Plan base ramp rate based on the participation analysis (discussed on next slides)

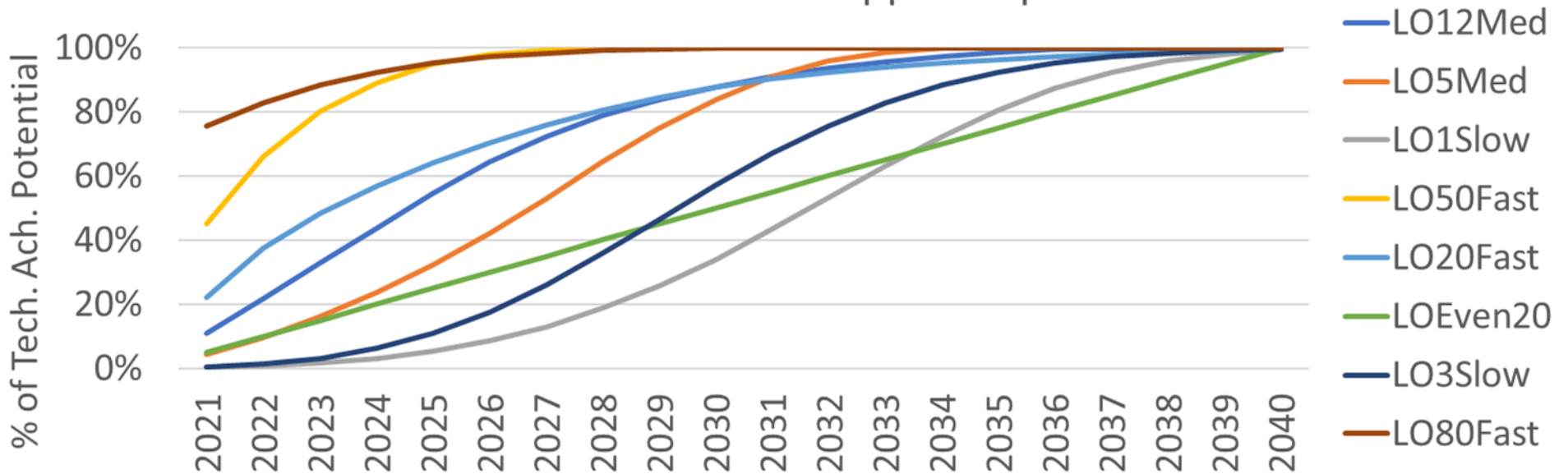
# NWPCC 2021 Plan Ramp Rates



## NWPCC 2021 Plan Retrofit Ramp Rates



## NWPCC 2021 Plan Lost Opp. Ramp Rates



# Residential Ramp Rate Adjustments by State

| Sector(s) | Measure Category | Equipment or Non-Equip | 2019 CPA Ramp Rate                         | 2021 Plan Ramp Rate                       | CA         | WA  | UT                                    | ID                                     | WY   |
|-----------|------------------|------------------------|--|---|------------|---|---------------------------------------|--|--|
| Res       | Appliances       | Equipment              | LO1Slow                                    | LO12Med                                   | NA         | LO1Slow   | LO1Slow                               | NA                                     | LO1Slow  |
| Res       | Building Shell   | Non-Equipment          | Retro12Med                                 | NA  | Retro1Slow | Retro1Slow  | Retro1Slow                            | Retro1Slow                             | Retro1Slow   |
| Res       | Energy Kits      | Non-Equipment          | Aerators<br>Retro3Slow, SH<br>Ret12Med     | Retro3Med                                 | Retro12Med | Retro12Med  | Aerator<br>Retro3Slow, SH<br>Ret12Med | Aerators<br>Retro3Slow, SH<br>Ret12Med | Retro12Med   |
| Res       | HVAC             | Equipment              | LO5Med CAC,<br>LO1Slow RAC                 | LO5Med CAC,<br>LO12Med RAC                | LO5Med     | LO12Med   | LO12Med                               | LO5Slow                                | LO5Med CAC,<br>LO12Med RAC                             |
| Res       | HVAC             | Non-Equipment          | Thermostat<br>Retro5Med, DHP<br>Retro3Slow | Thermostat<br>Retro5Med, DHP<br>Retro5Med | Retro5Med  | Thermostats at<br>Retro5Med, DHP<br>to Retro3Slow | Tstat<br>Retro5Med, DHP<br>Retro3Slow | Tstat<br>Retro5Med, DHP<br>Retro3Slow  | DHP to<br>Retro3Slow, no<br>Tstat mapped in<br>program |
| Res       | Lighting         | Equipment              | LO12Med &<br>LO20 Fast                     | LO20Fast                                  | LO50Fast   | LO80Fast  | LO80Fast                              | LO50Fast                               | LO50Fast   |
| Res       | Water Heating    | Equipment              | LO3Slow                                    | LO5Med                                    | LO3Slow    | LO5Med  | LO1Slow                               | LO1Slow                                | LO1Slow  |
| Res       | Whole Home       | Non-Equipment          | LOEven20                                   | NA  | -          | LOEven20  | LO20Even                              | LOEven20                               | NA   |
| Res       | Electronics      | Non-Equipment          | Retro3Slow                                 | Retro3Slow                                | NA         | NA  | NA                                    | Retro5Med                              | Retro5Med  |

- Many residential categories were adjusted to faster ramp rates
  - Residential programs have already transitioned away from lighting
- NWPCC 2021 Plan Ramp Rates included for reference

## Legend:

Faster Ramp

Slower Ramp

No Change

\*compared to 2019  
CPA Ramps



# Commercial & Industrial Ramp Rate Adjustments by State

| Sector(s) | Measure Category       | Equipment or Non-Equip | 2019 CPA Ramp Rate                              | 2021 Plan Ramp Rate          | Ramp Rate Updates Implemented in 2021 CPA |                              |                    |                    |                    |
|-----------|------------------------|------------------------|---|------------------------------|---|------------------------------|--------------------|--------------------|--------------------|
|           |                        |                        |   |                              | CA  | WA                           | UT                 | ID                 | WY                 |
| C&I       | Building Shell         | Non-Equipment          | RetroEven20                                     | <i>Retro1Slow</i>            | NA  | <i>Retro1Slow</i>            | <i>Retro1Slow</i>  | <i>Retro1Slow</i>  | <i>Retro1Slow</i>  |
| C&I       | Compressed Air         | Both                   | Retro5Med, Retro12Med                           | <i>Retro5Med, Retro12Med</i> | NA  | <i>Retro3Slow, Retro5Med</i> | <i>Retro3Slow</i>  | <i>Retro5Med</i>   | <i>Retro3Slow</i>  |
| C&I       | Energy Management      | Non-Equipment          | Retro12Med                                      | <i>Retro5Med</i>             | <i>Retro5Med</i>                          | <i>Retro5Med</i>             | Retro12Med         | <i>Retro5Med</i>   | <i>Retro5Med</i>   |
| C&I       | Food Service Equipment | Equipment              | LO5Med, LO12Med                                 | <i>LO3Slow, LO1Slow</i>      | NA  | <i>LO3Slow, LO1Slow</i>      | LO5Med, LO12Med    | <i>LO12Med</i>     | LO5Med, LO12Med    |
| C&I       | HVAC                   | Equipment              | LO5Med, LO20Fast                                | <i>LO5Med, LO12Med</i>       | NA  | <i>LO5Med, LO12Med</i>       | LO5Med, LO20Fast   | LO5Med, LO20Fast   | LO5Med, LO20Fast   |
| C&I       | HVAC                   | Non-Equipment          | RetroEven20, Retro12Med, Retro3Slow, Retro1Slow | <i>Retro12Med, Retro5Med</i> | Retro12Med, Retro5Med                     | <i>Retro1Slow</i>            | <i>Retro3Slow</i>  | <i>Retro5Med</i>   | <i>Retro3Slow</i>  |
| C&I       | Irrigation             | Non-Equipment          | Retro12Med mostly                               | <i>RetroEven20</i>           | <i>RetroEven20</i>                        | <i>RetroEven20</i>           | <i>RetroEven20</i> | <i>RetroEven20</i> | <i>RetroEven20</i> |
| C&I       | Lighting               | Equipment              | LO20Fast/LO50 Fast                              | <i>LO80Fast</i>              | <i>LO80Fast</i>                           | <i>LO80Fast</i>              | <i>LO80Fast</i>    | <i>LO80Fast</i>    | <i>LO80Fast</i>    |
| C&I       | Motors                 | Non-Equipment          | Retro12Med                                      | <i>Retro12Med</i>            | <i>Retro5Med</i>                          | <i>Retro5Med</i>             | <i>Retro12Med</i>  | <i>Retro5Med</i>   | <i>Retro12Med</i>  |
| C&I       | Refrigeration          | Both                   | Retro12Med                                      | <i>Retro5Med</i>             | <i>Retro3Slow</i>                         | <i>Retro12Med</i>            | <i>Retro5Med</i>   | <i>Retro3Slow</i>  | <i>Retro3Slow</i>  |

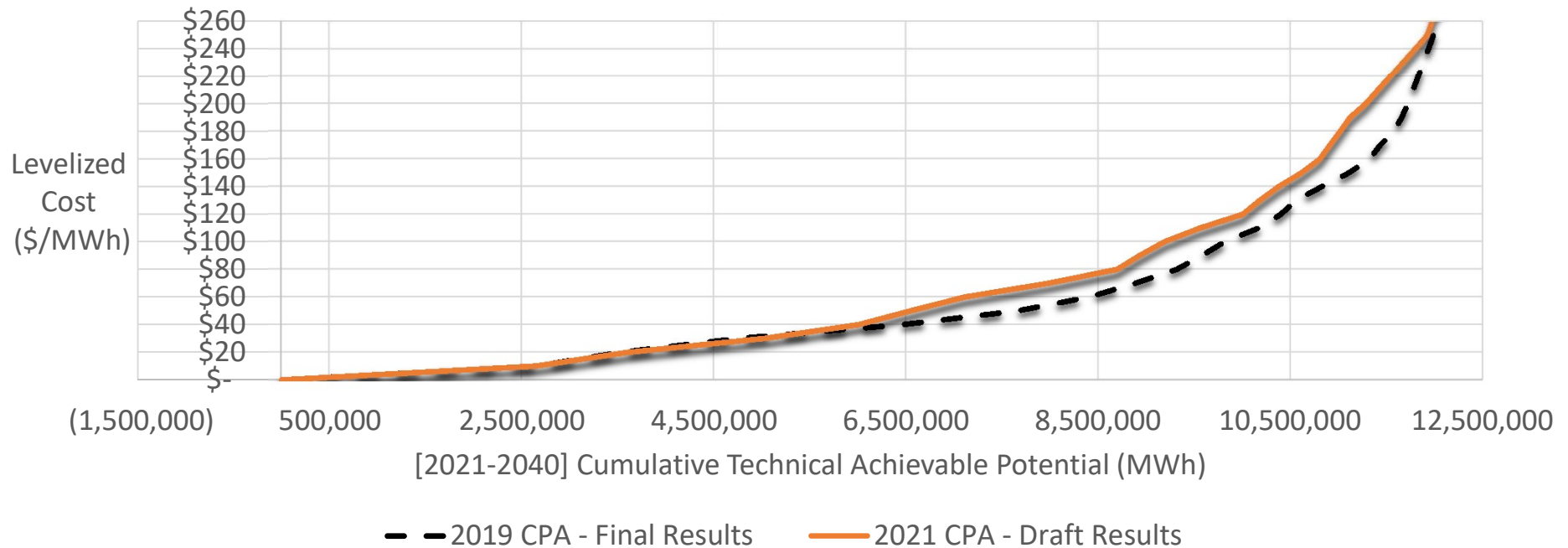
- In general, only the C&I Lighting category went to a faster ramp rate
- Many Retrofit measures slowed compared to the 2019 Ramp Rates
- NWPCC 2021 Plan Ramp Rates included for reference

Legend:  
*Faster Ramp*  
*Slower Ramp*  
 No Change or NA  
 \*compared to 2019  
 CPA Ramps



# 2021 CPA Results

# Technical Achievable Potential Supply Curve Comparison (All States – Cumulative MWh)



| Total Cumulative 20-year Potential Comparison (MWh) |            |              |
|---|------------|--------------|
| 2021 CPA  | 2019 CPA   | % Difference |
| 13,516,192  | 13,163,531 | +2.7%        |

Total 20-year cumulative potential is slightly higher than the previous study, but savings are more expensive because of the decrease in cheaper lighting savings

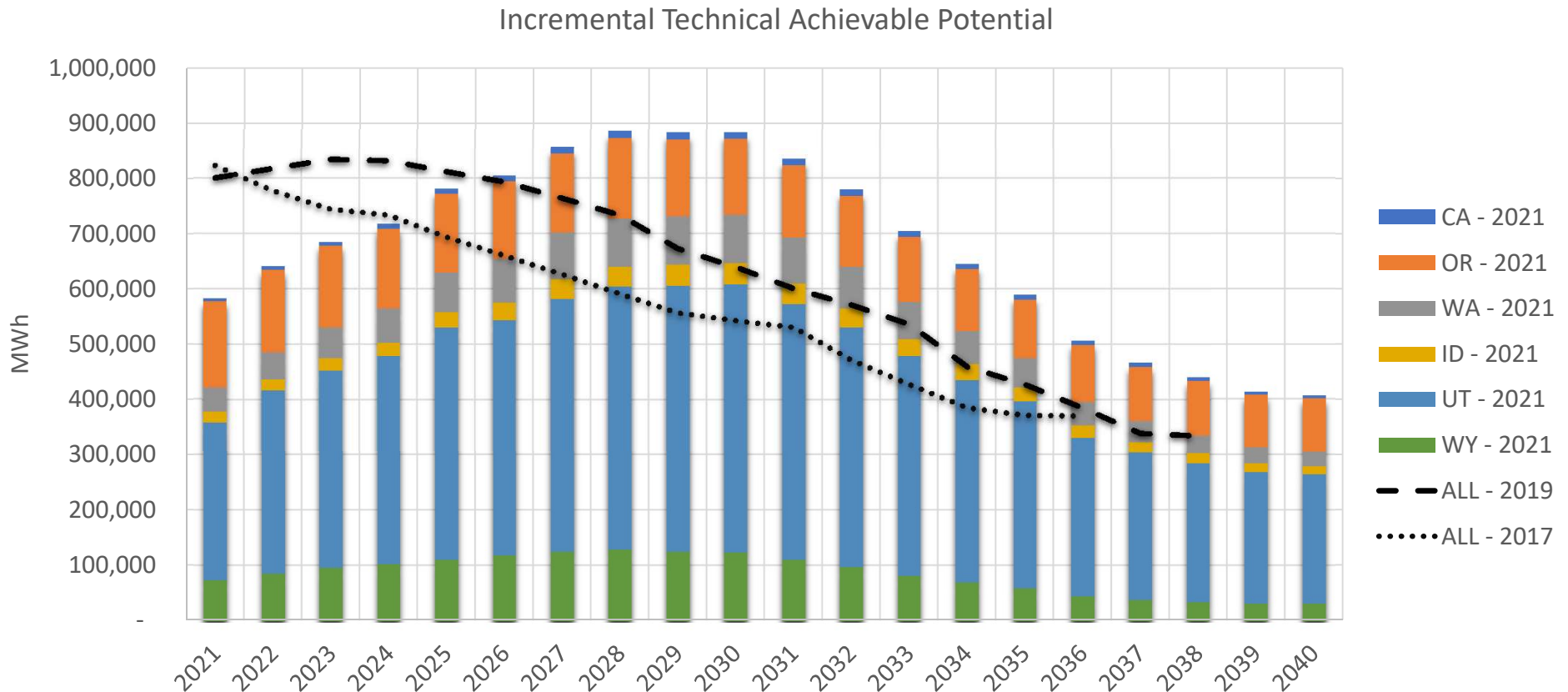
Cost bundles represent the technical achievable potential, ***not economic potential***

Each cost bundle represents a different weighted average load shape based on the measures within it.

Cost bundles are selected in the IRP based on economics and their ability to contribute to the system in competition with all other supply-side resources.



# Technical Achievable Potential Comparison (All States - Incremental MWh)

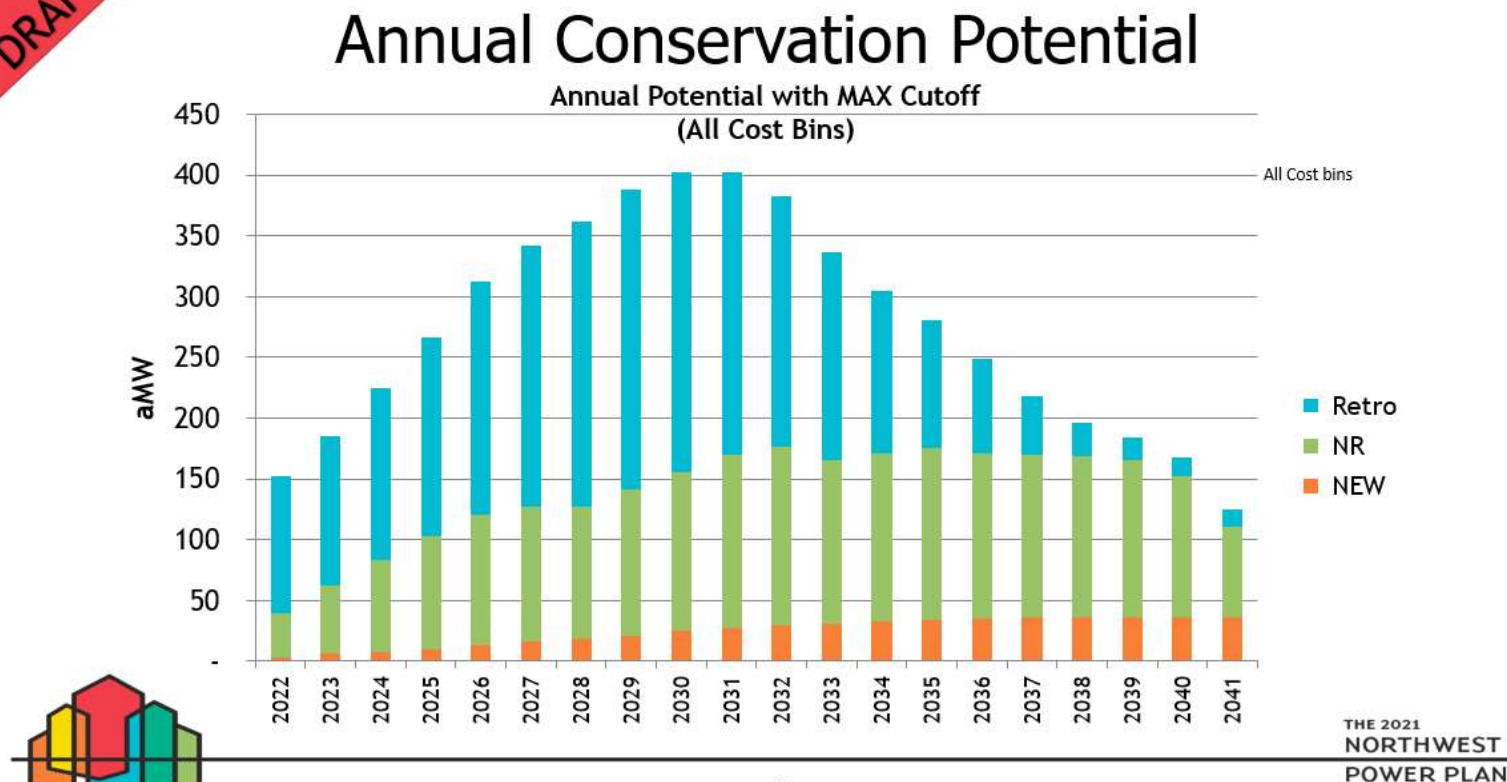


- Incremental savings opportunities have been moved out in time
  - Lighting savings decreases and ramp rate adjustments
- LEDs have a large impact on early year savings opportunities compared to previous
  - Similar trend in NWPCC 2021 Plan (next slide)
- Graph illustrates the dynamic nature of energy efficiency and forecasting

# Comparison to NWPCC 2021 Power Plan Incremental MWh Tech. Ach. Results

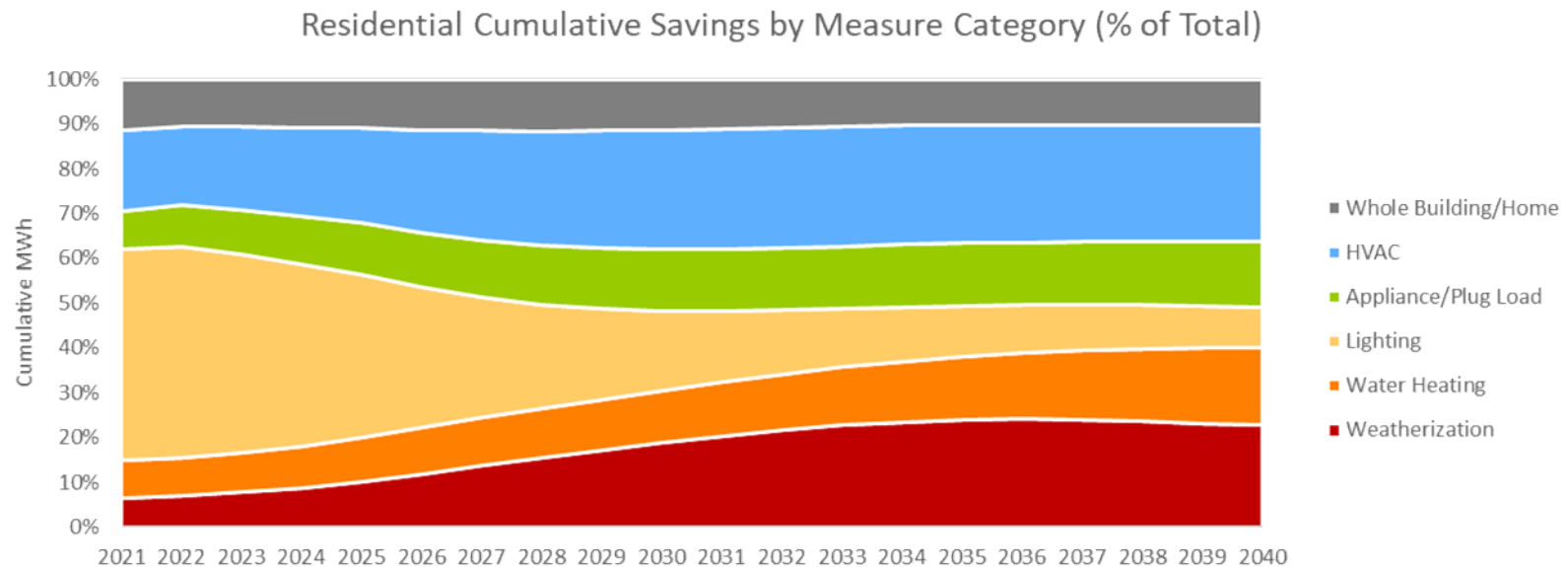
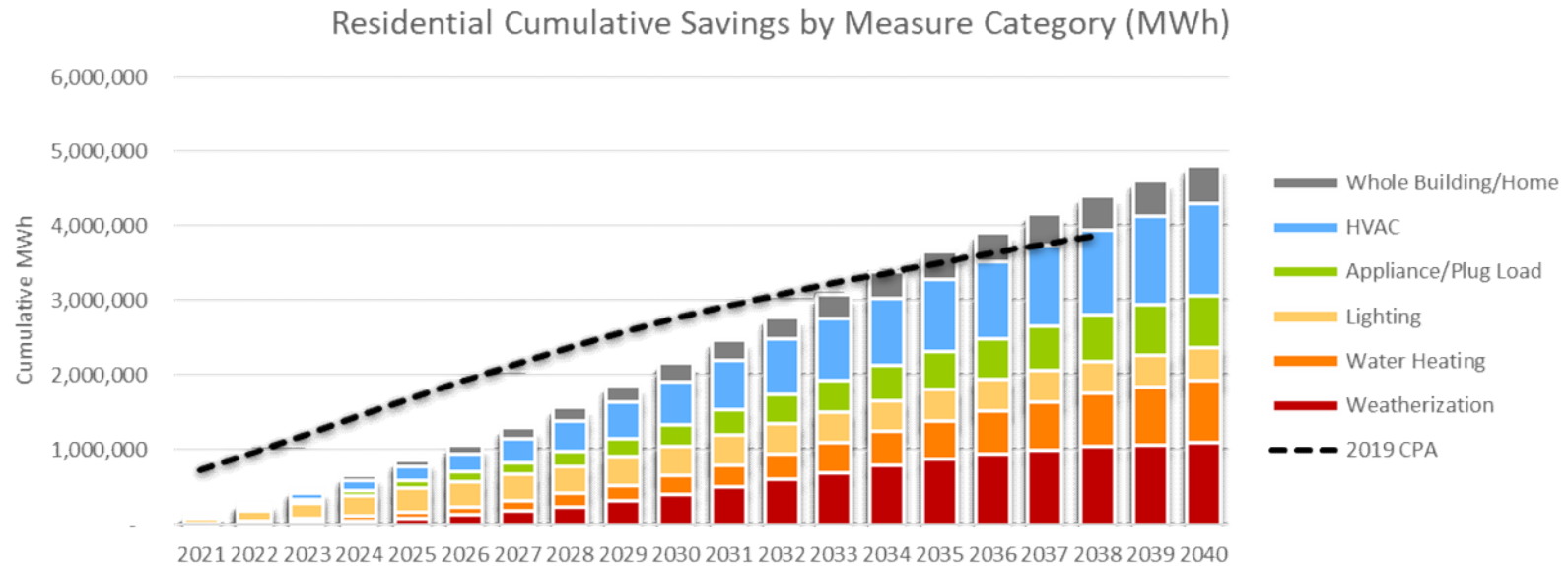


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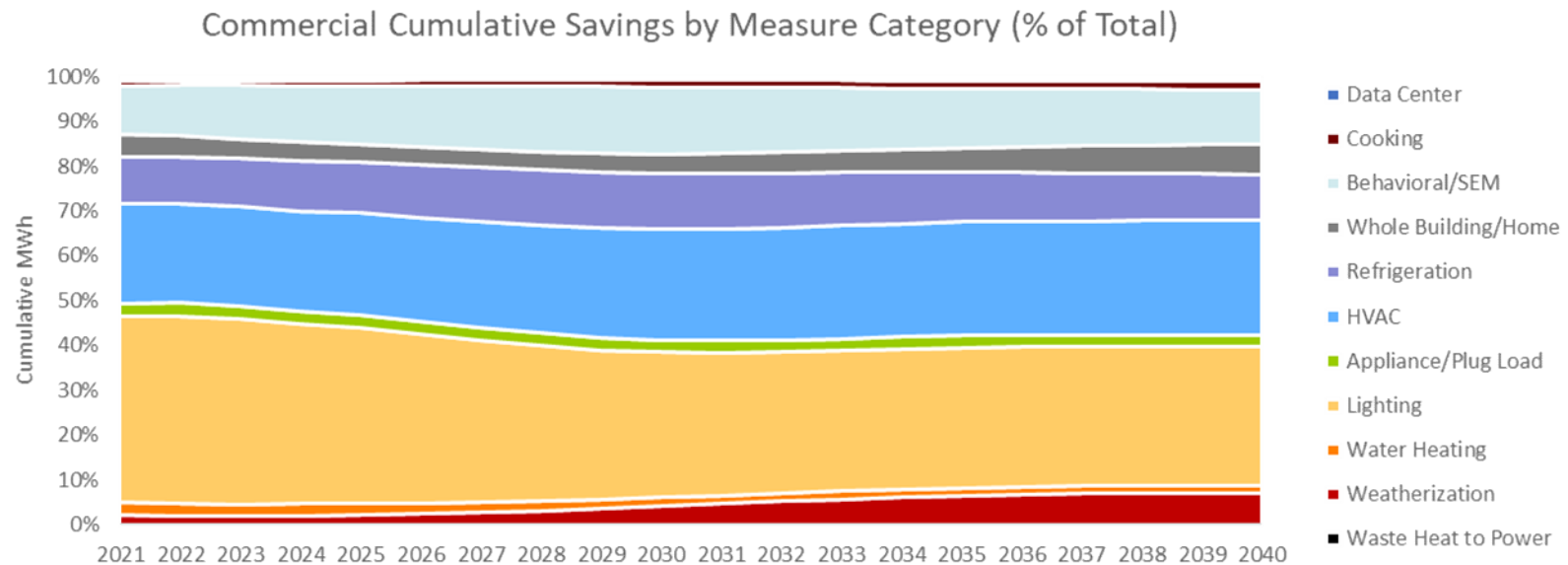
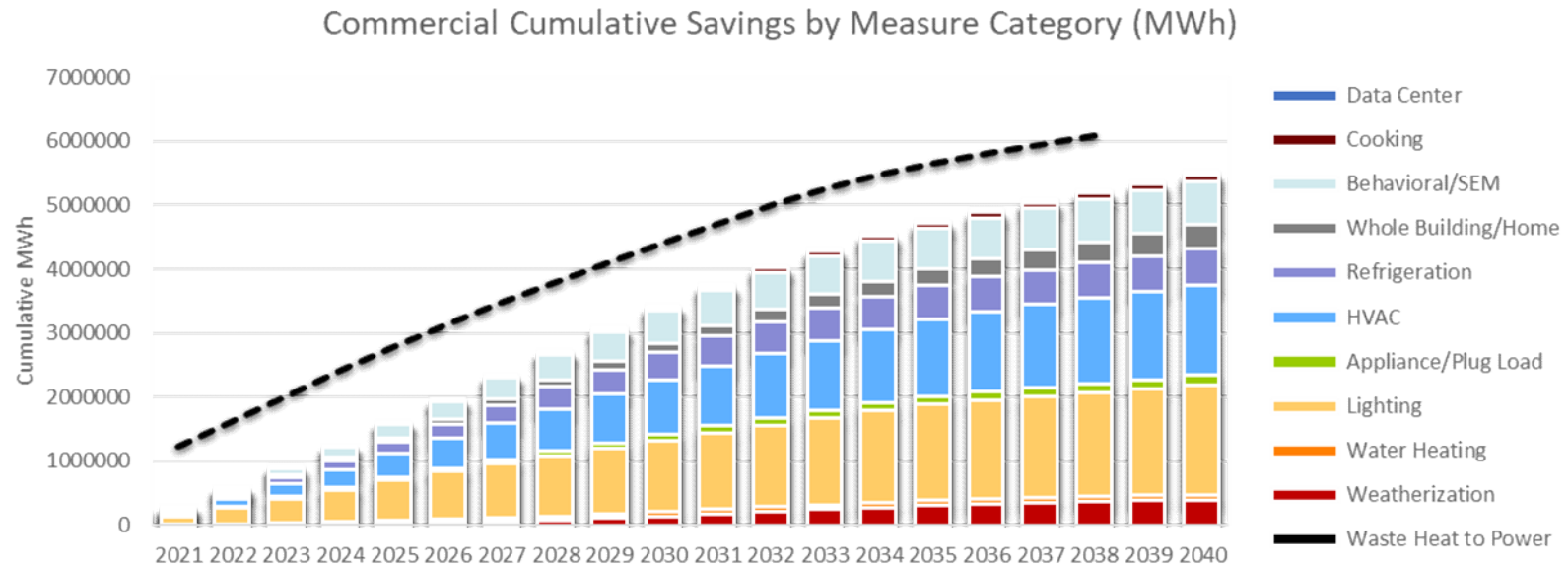


- Similar overall shape to the PacifiCorp 2021 CPA Draft Results
- Curve starts even lower due to lighting market baselines for all states, not just some states as in the PacifiCorp 2021 CPA Draft Results
- Source: NWPCC <https://nwcouncil.app.box.com/s/f7v6uhiw4k8qwp0c7ovzvrgom9o71hre>

# Residential Draft Results (All States)



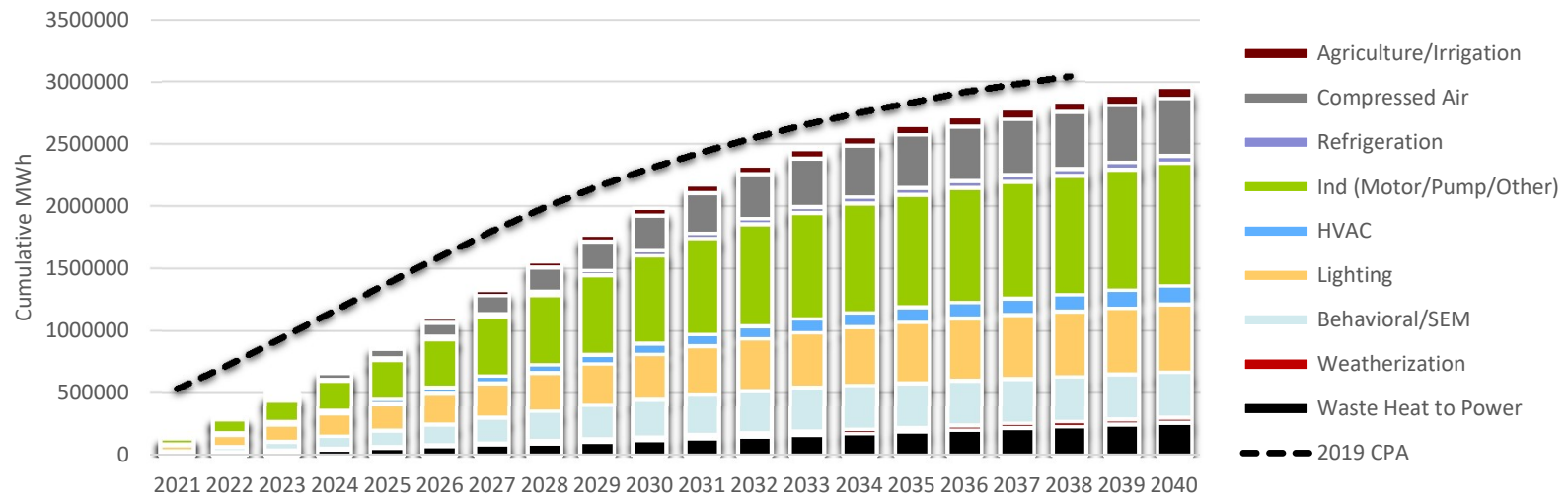
# Commercial Draft Results (All States)



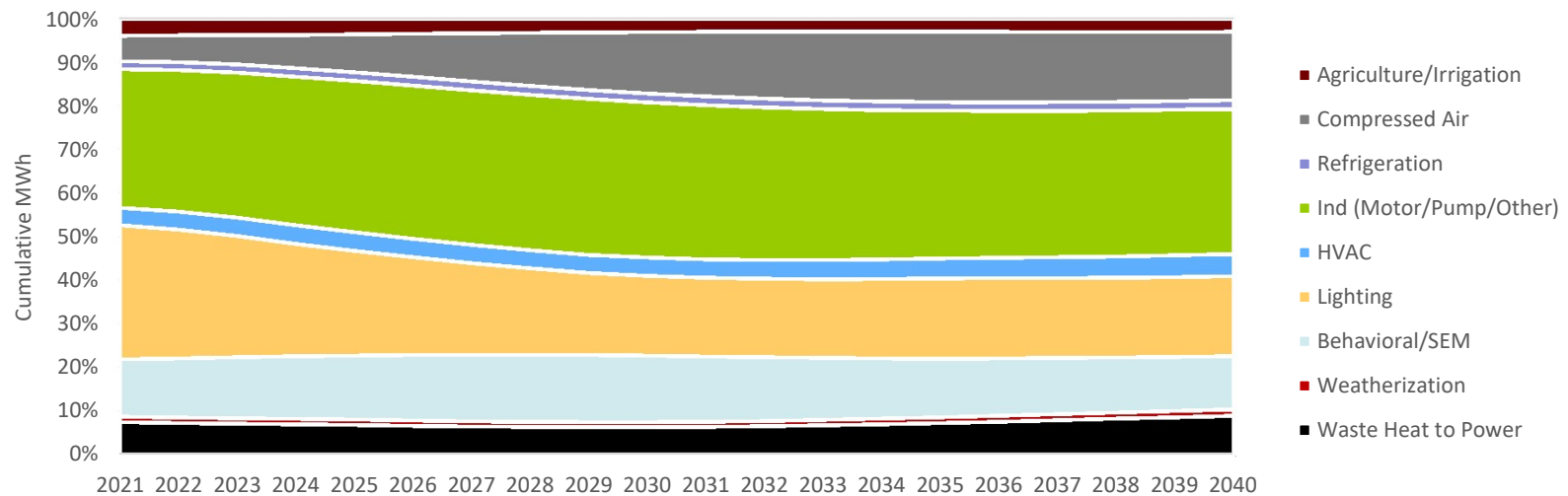
# Industrial Draft Results (All States)



## Industrial Cumulative Savings by Measure Category (MWh)



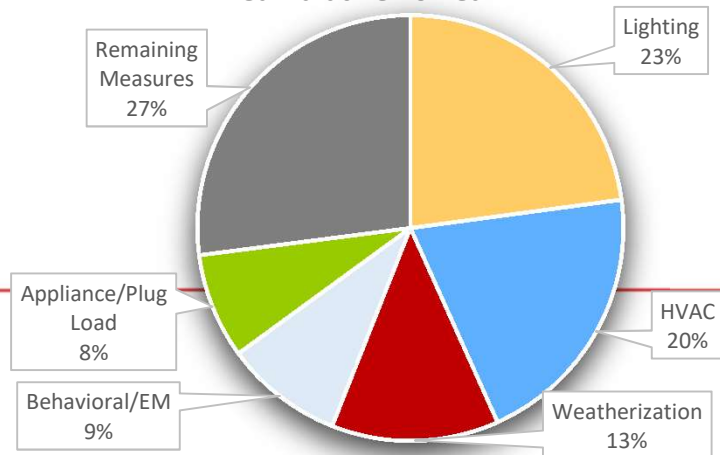
## Industrial Cumulative Savings by Measure Category (% of Total)



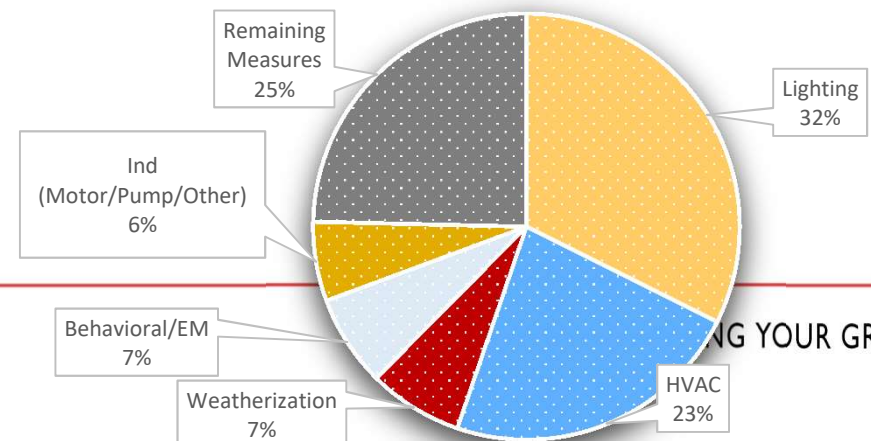
# Utah - Top Measures (MWh)

| 2040 Rank | Measure Type           | 2021 CPA Draft: 20-Year Cumulative Potential | % of Total    | 2019 CPA 20 Year Cumulative Potential | % Change     |
|-----------|------------------------|--|---------------|---------------------------------------|--------------|
| 1         | Lighting               | 1,686,728                                    | 22.9%         | 1,955,444                             | -13.7%       |
| 2         | HVAC                   | 1,505,509                                    | 20.4%         | 1,382,225                             | 8.9%         |
| 3         | Weatherization         | 936,397                                      | 12.7%         | 432,601                               | 116.5%       |
| 4         | Behavioral/EM          | 662,245                                      | 9.0%          | 419,183                               | 58.0%        |
| 5         | Appliance/Plug Load    | 589,442                                      | 8.0%          | 273,043                               | 115.9%       |
| 6         | Water Heating          | 526,470                                      | 7.1%          | 329,590                               | 59.7%        |
| 7         | Whole Building/Home    | 362,607                                      | 4.9%          | 273,062                               | 32.8%        |
| 8         | Refrigeration          | 316,864                                      | 4.3%          | 143,810                               | 120.3%       |
| 9         | Ind (Motor/Pump/Other) | 310,137                                      | 4.2%          | 363,476                               | -14.7%       |
| 10        | Waste Heat to Power    | 206,937                                      | 2.8%          | 150,698                               | 37.3%        |
| 11        | Compressed Air         | 128,913                                      | 1.7%          | 162,429                               | -20.6%       |
| 12        | Cooking                | 63,523                                       | 0.9%          | 99,210                                | -36.0%       |
| 13        | Data Center            | 52,776                                       | 0.7%          | 23,884                                | 121.0%       |
| 14        | Agriculture/Irrigation | 25,806                                       | 0.3%          | 32,277                                | -20.0%       |
|           | <b>Total</b>           | <b>7,374,352</b>                             | <b>100.0%</b> | <b>6,040,931</b>                      | <b>22.1%</b> |

Utah, Technical Achievable Savings 2021 CPA  
Cumulative 20-Year MWh



Utah, Technical Achievable Savings 2019 CPA  
Cumulative 20-Year MWh

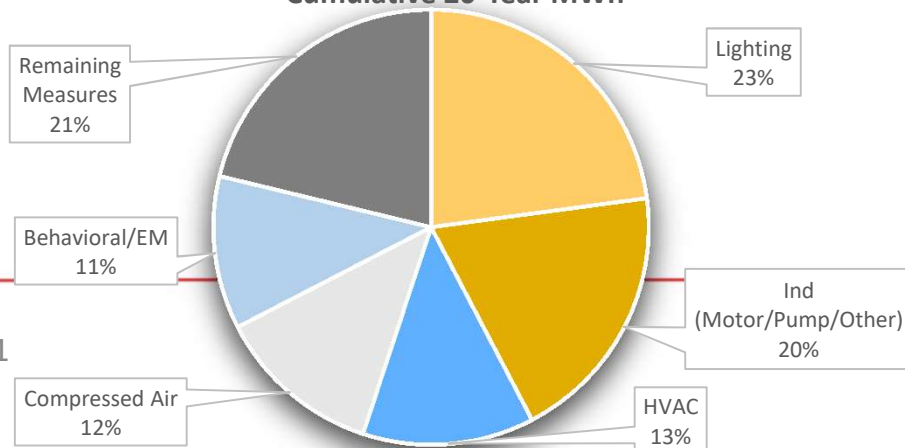




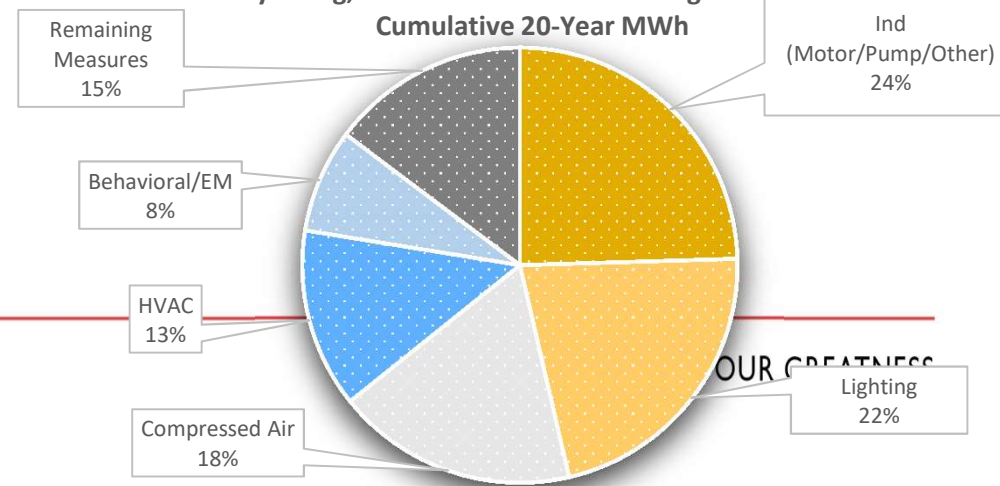
# Wyoming - Top Measures (MWh)

| Rank | Measure Type           | 2021 CPA Draft: 20-Year Cumulative Potential | % of Total    | 2019 CPA 20 Year Cumulative Potential | % Change     |
|------|------------------------|--|---------------|---------------------------------------|--------------|
| 1    | Lighting               | 385,020                                      | 22.9%         | 379,848                               | 1.4%         |
| 2    | Ind (Motor/Pump/Other) | 327,392                                      | 19.4%         | 426,479                               | -23.2%       |
| 3    | HVAC                   | 214,536                                      | 12.7%         | 231,657                               | -7.4%        |
| 4    | Compressed Air         | 207,772                                      | 12.3%         | 310,768                               | -33.1%       |
| 5    | Behavioral/EM          | 191,406                                      | 11.4%         | 133,840                               | 43.0%        |
| 6    | Weatherization         | 110,122                                      | 6.5%          | 52,190                                | 111.0%       |
| 7    | Appliance/Plug Load    | 61,657                                       | 3.7%          | 33,096                                | 86.3%        |
| 8    | Water Heating          | 56,008                                       | 3.3%          | 70,293                                | -20.3%       |
| 9    | Refrigeration          | 49,271                                       | 2.9%          | 27,770                                | 77.4%        |
| 10   | Waste Heat to Power    | 33,973                                       | 2.0%          | 27,515                                | 23.5%        |
| 11   | Whole Building/Home    | 33,481                                       | 2.0%          | 25,765                                | 29.9%        |
| 12   | Cooking                | 8,531  | 0.5%          | 14,440                                | -40.9%       |
| 13   | Agriculture/Irrigation | 4,180  | 0.2%          | 5,029                                 | -16.9%       |
| 14   | Data Center            | 13   | 0.0%          | 310                                   | -95.8%       |
|      | <b>Total</b>           | <b>1,683,363</b>                             | <b>100.0%</b> | <b>1,739,002</b>                      | <b>-3.2%</b> |

Wyoming, Technical Achievable Savings 2021 CPA  
Cumulative 20-Year MWh



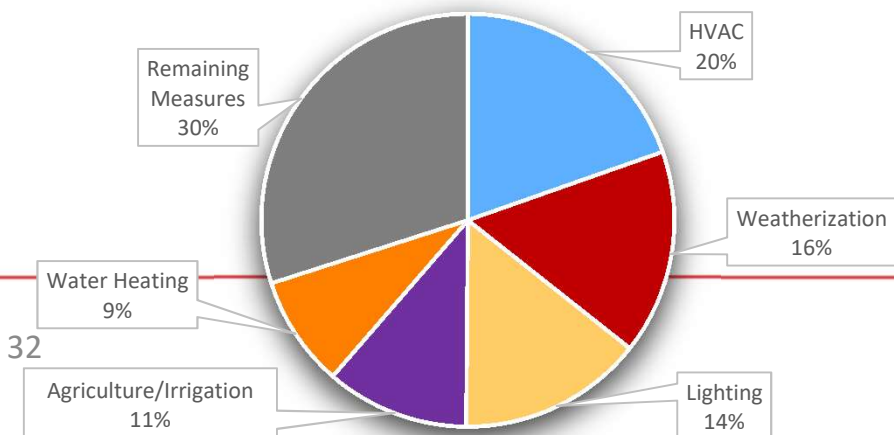
Wyoming, Technical Achievable Savings 2019 CPA  
Cumulative 20-Year MWh



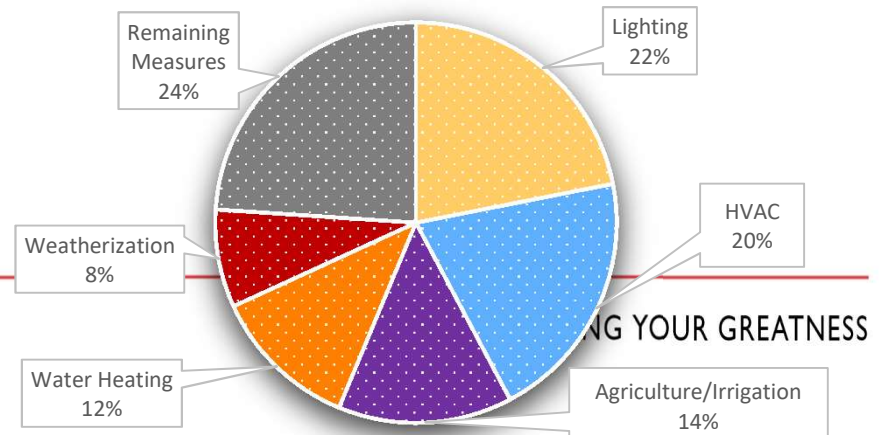
# Idaho - Top Measures (MWh)

| Rank | Measure Type           | 2021 CPA Draft: 20-Year Cumulative Potential | % of Total    | 2019 CPA 20 Year Cumulative Potential | % Change    |
|------|------------------------|--|---------------|---------------------------------------|-------------|
| 1    | HVAC                   | 105,876                                      | 19.6%         | 105,157                               | 0.7%        |
| 2    | Weatherization         | 86,446                                       | 16.0%         | 40,902                                | 111.4%      |
| 3    | Lighting               | 78,111                                       | 14.5%         | 113,223                               | -31.0%      |
| 4    | Agriculture/Irrigation | 60,553                                       | 11.2%         | 72,579                                | -16.6%      |
| 5    | Water Heating          | 46,910                                       | 8.7%          | 61,458                                | -23.7%      |
| 6    | Appliance/Plug Load    | 38,975                                       | 7.2%          | 22,386                                | 74.1%       |
| 7    | Behavioral/EM          | 35,602                                       | 6.6%          | 28,369                                | 25.5%       |
| 8    | Whole Building/Home    | 28,480                                       | 5.3%          | 21,696                                | 31.3%       |
| 9    | Refrigeration          | 24,182                                       | 4.5%          | 12,944                                | 86.8%       |
| 10   | Compressed Air         | 14,681                                       | 2.7%          | 8,808                                 | 66.7%       |
| 11   | Ind (Motor/Pump/Other) | 13,585                                       | 2.5%          | 17,625                                | -22.9%      |
| 12   | Cooking                | 3,380  | 0.6%          | 8,862                                 | -61.9%      |
| 13   | Waste Heat to Power    | 2,642  | 0.5%          | 2,984                                 | -11.5%      |
| 14   | Data Center            | 31   | 0.0%          | 155                                   | -80.2%      |
|      | <b>Total</b>           | <b>539,454</b>                               | <b>100.0%</b> | <b>517,148</b>                        | <b>4.3%</b> |

Idaho, Technical Achievable Savings 2021 CPA  
Cumulative 20-Year MWh



Idaho, Technical Achievable Savings 2019 CPA  
Cumulative 20-Year MWh





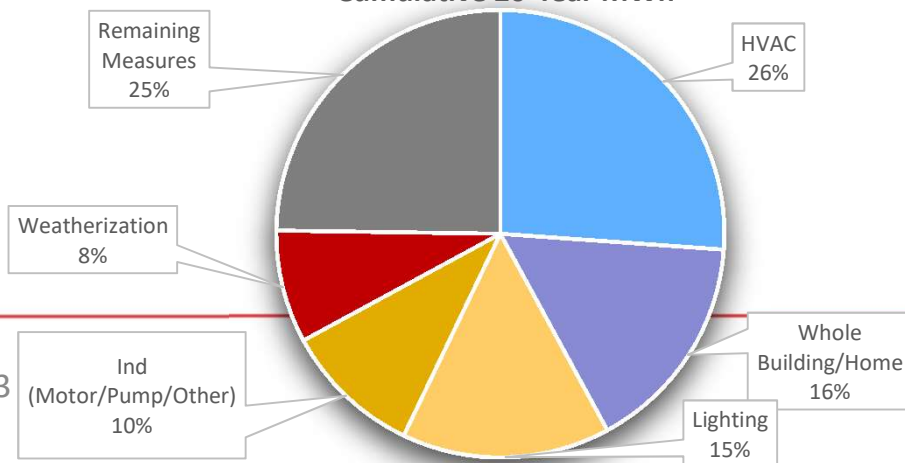
# Oregon - Top Measures (MWh)

| 2040 Rank | Measure Type           | 2021 CPA Draft: 20-Year Cumulative Potential | % of Total    | 2019 CPA 20 Year Cumulative Potential | % Change      |
|-----------|------------------------|--|---------------|---------------------------------------|---------------|
| 1         | HVAC                   | 660,002                                      | 26.1%         | 823,842                               | -19.9%        |
| 2         | Whole Building/Home    | 402,684                                      | 15.9%         | 575,256                               | -30.0%        |
| 3         | Lighting               | 379,532                                      | 15.0%         | 684,512                               | -44.6%        |
| 4         | Ind (Motor/Pump/Other) | 252,156                                      | 10.0%         | 246,802                               | 2.2%          |
| 5         | Weatherization         | 205,695                                      | 8.1%          | 299,495                               | -31.3%        |
| 6         | Water Heating          | 157,208                                      | 6.2%          | 243,458                               | -35.4%        |
| 7         | Behavioral/SEM         | 130,754                                      | 5.2%          | 110,903                               | 17.9%         |
| 8         | Refrigeration          | 89,846                                       | 3.6%          | 59,378                                | 51.3%         |
| 9         | Agriculture/Irrigation | 85,981                                       | 3.4%          | 46,774                                | 83.8%         |
| 10        | Appliance/Plug Load    | 79,676                                       | 3.2%          | 183,412                               | -56.6%        |
| 11        | Compressed Air         | 64,384                                       | 2.5%          | 248,007                               | -74.0%        |
| 12        | Cooking                | 17,819                                       | 0.7%          | 22,489                                | -20.8%        |
|           | <b>Total</b>           | <b>2,525,737</b>                             | <b>100.0%</b> | <b>3,544,327</b>                      | <b>-28.7%</b> |

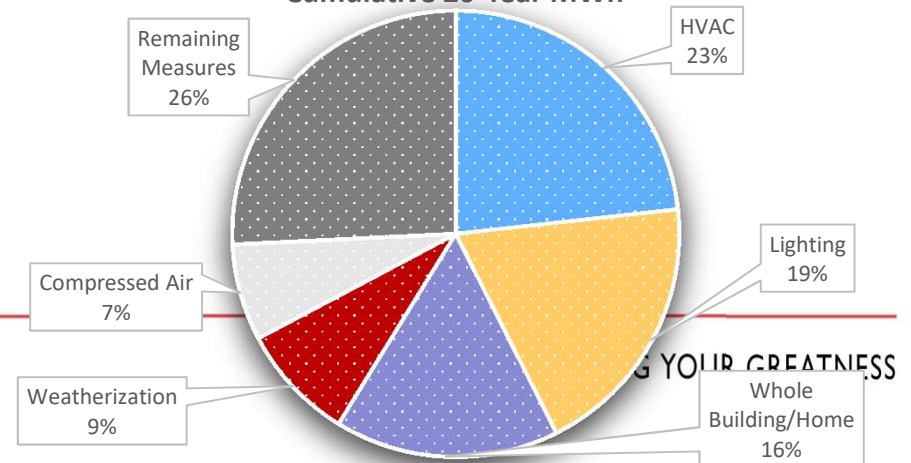
\*The 2019 CPA included a large project adder every year, which accounted for 5% of OR's cumulative savings in 2019 - The large project adder has been removed from the forecast in 2021 CPA

\*\* Oregon's numbers will change with updated budget forecasts currently under development before final results to input into the IRP

Oregon, Technical Achievable Savings 2021 CPA  
Cumulative 20-Year MWh



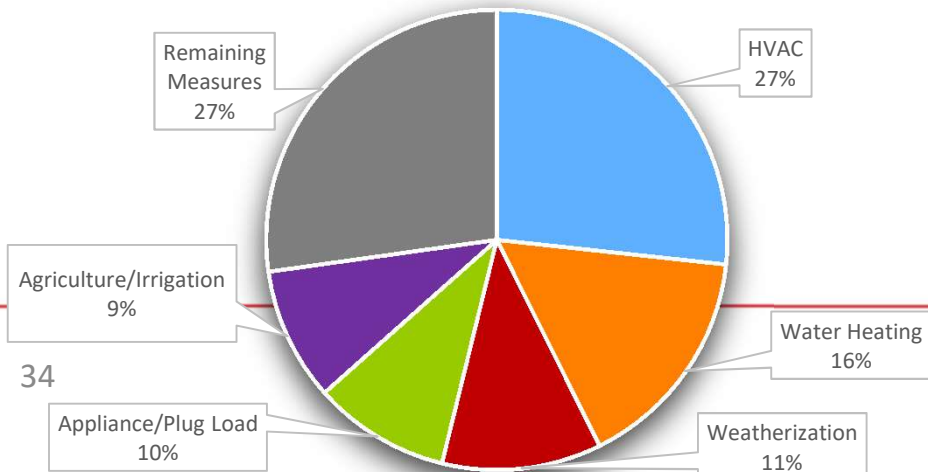
Oregon, Technical Achievable Savings 2019 CPA  
Cumulative 20-Year MWh



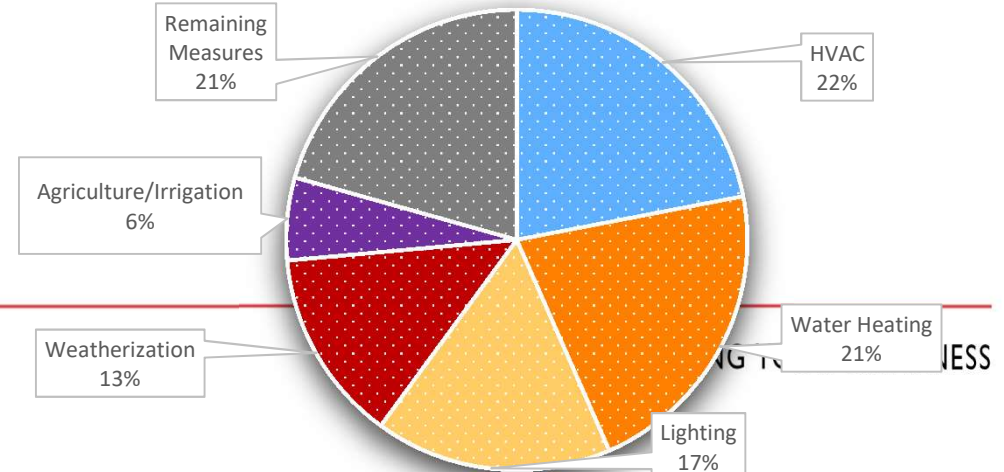
# California - Top Measures (MWh)

| Rank         | Measure Type           | 2021 CPA Draft: 20-Year Cumulative Potential | % of Total    | 2019 CPA 20 Year Cumulative Potential | % Change      |
|--------------|------------------------|--|---------------|---------------------------------------|---------------|
| 1            | HVAC                   | 48,975                                       | 26.7%         | 46,449                                | 5.4%          |
| 2            | Water Heating          | 29,215                                       | 15.9%         | 45,388                                | -35.6%        |
| 3            | Weatherization         | 20,506                                       | 11.2%         | 28,600                                | -28.3%        |
| 4            | Appliance/Plug Load    | 17,620                                       | 9.6%          | 11,461                                | 53.7%         |
| 5            | Agriculture/Irrigation | 17,145                                       | 9.4%          | 12,285                                | 39.6%         |
| 6            | Refrigeration          | 15,206                                       | 8.3%          | 6,649                                 | 128.7%        |
| 7            | Behavioral/EM          | 13,486                                       | 7.4%          | 10,145                                | 32.9%         |
| 8            | Lighting               | 7,892  | 4.3%          | 35,150                                | -77.5%        |
| 9            | Whole Building/Home    | 5,470  | 3.0%          | 5,095                                 | 7.4%          |
| 10           | Ind (Motor/Pump/Other) | 2,778  | 1.5%          | 5,109                                 | -45.6%        |
| 11           | Cooking                | 2,297  | 1.3%          | 3,426                                 | -33.0%        |
| 12           | Compressed Air         | 1,779  | 1.0%          | 1,418                                 | 25.4%         |
| 13           | Waste Heat to Power    | 996  | 0.5%          | 269                                   | 270.0%        |
| 14           | Data Center            | 1  | 0.0%          | 52                                    | -97.2%        |
| <b>Total</b> |                        | <b>183,366</b>                               | <b>100.0%</b> | <b>211,495</b>                        | <b>-13.3%</b> |

California, Technical Achievable Savings 2021 CPA  
Cumulative 20-Year MWh



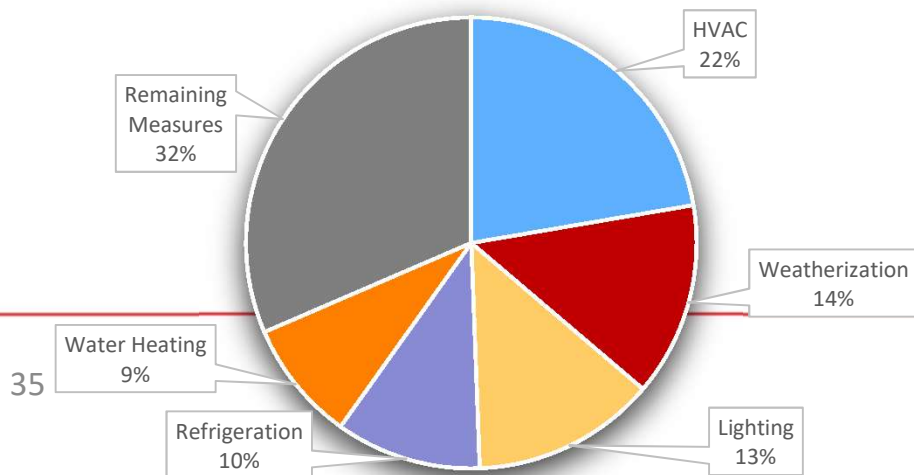
California, Technical Achievable Savings 2019 CPA  
Cumulative 20-Year MWh



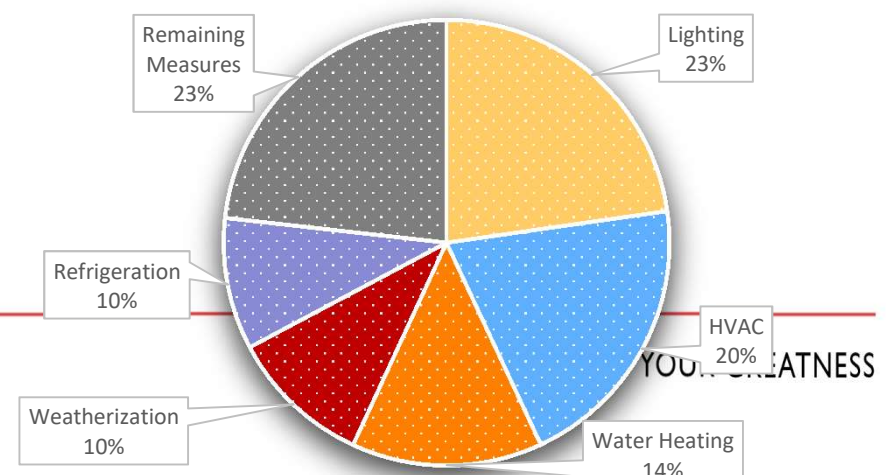
# Washington - Top Measures (MWh)

| Rank | Measure Type           | 2021 CPA Draft: 20-Year Cumulative Potential | % of Total    | 2019 CPA 20 Year Cumulative Potential | % Change    |
|------|------------------------|--|---------------|---------------------------------------|-------------|
| 1    | HVAC                   | 269,983                                      | 22.3%         | 225,646                               | 19.6%       |
| 2    | Weatherization         | 168,126                                      | 13.9%         | 114,776                               | 46.5%       |
| 3    | Lighting               | 159,645                                      | 13.2%         | 252,504                               | -36.8%      |
| 4    | Refrigeration          | 126,416                                      | 10.4%         | 106,112                               | 19.1%       |
| 5    | Water Heating          | 105,030                                      | 8.7%          | 153,662                               | -31.6%      |
| 6    | Behavioral/EM          | 89,917                                       | 7.4%          | 39,234                                | 129.2%      |
| 7    | Ind (Motor/Pump/Other) | 77,472                                       | 6.4%          | 65,967                                | 17.4%       |
| 8    | Appliance/Plug Load    | 68,298                                       | 5.6%          | 41,874                                | 63.1%       |
| 9    | Compressed Air         | 45,258                                       | 3.7%          | 24,047                                | 88.2%       |
| 10   | Whole Building/Home    | 40,238                                       | 3.3%          | 29,738                                | 35.3%       |
| 11   | Agriculture/Irrigation | 31,848                                       | 2.6%          | 23,432                                | 35.9%       |
| 12   | Waste Heat to Power    | 19,615                                       | 1.6%          | 14,777                                | 32.7%       |
| 13   | Cooking                | 7,952  | 0.7%          | 18,484                                | -57.0%      |
| 14   | Data Center            | 124  | 0.0%          | 374                                   | -66.8%      |
|      | <b>Total</b>           | <b>1,209,920</b>                             | <b>100.0%</b> | <b>1,110,628</b>                      | <b>8.9%</b> |

Washington, Technical Achievable Savings 2021 CPA  
Cumulative 20-Year MWh



Washington, Technical Achievable Savings 2019 CPA  
Cumulative 20-Year MWh



# WA Low Income Results

- PacifiCorp requested AEG segment low income from standard income in WA in compliance with HB1444
- Low Income cutoff defined at 200% of the federal poverty level
- AEG adjusted baseline saturations from segmented residential survey data
- Analysis only completed for WA

| Segment            | 2022 MWh      | 2025 MWh      | 2030 MWh       | 2040 MWh       | % of 2040     |
|--------------------|---------------|---------------|----------------|----------------|---------------|
| Single Family      | 10,111        | 37,389        | 129,745        | 276,801        | 55.2%         |
| Multi-Family       | 638           | 2,419         | 8,572          | 20,472         | 4.1%          |
| Mobile Home        | 1,518         | 6,113         | 22,567         | 48,053         | 9.6%          |
| Single Family - LI | 3,213         | 11,995        | 41,425         | 87,330         | 17.4%         |
| Multi-Family - LI  | 935           | 3,578         | 12,854         | 31,315         | 6.2%          |
| Mobile Home - LI   | 1,220         | 4,868         | 17,724         | 37,154         | 7.4%          |
| <i>Total</i>       | <i>17,634</i> | <i>66,362</i> | <i>232,885</i> | <i>501,125</i> | <i>100.0%</i> |



# Demand Response Draft Results





# Demand Response Stakeholder Process



# Stakeholder Process To-Date



- **December 2019:** [Draft CPA Work Plan](#) provided to stakeholders for review and comment
- **January 2020:** [CPA Workshop #1](#). CPA overview and planned changes from 2019 CPA.
- **February 2020:** [Draft Resource List](#), [CPA Workshop #2](#). Defining demand measures:
  - Definitions
  - Evolving considerations
  - Research of impacts and costs
  - Resource Options
  - Consideration of customer-sited energy storage
- **April 2020:** [Draft Measure List](#), [CPA Workshop #3](#). Follow-up discussion on grid services and energy storage.
- **August 2020:** Presentation of Draft Potential Results

# Key Changes Relative to the 2019 CPA

- New areas of focus based on recent PacifiCorp experience and stakeholder interest
  - Grid services view of DR; previously focused only on peak shaving
  - Control of pool pumps
  - Customer-sited energy storage
- Updates to AEG methodology:
  - Technology-based vs. program-based
  - Incorporates changes in equipment efficiency and adoption of enabling technology from energy efficiency forecast
  - Hourly potential estimation to allow flexibility in hours of interest
  - Assessment of impacts from short- and sustained-duration events
- Washington standard requiring new residential electric water heaters to include a modular DR communications port
- Development of the Northwest Power and Conservation Council's 2021 Power Plan, including demand response assumptions



# DR Resources Assessed



| State                      | Residential | Commercial | Industrial | Irrigation | New for 2021 CPA |
|----------------------------|-------------|------------|------------|------------|------------------|
| Central Cooling            | ✓           | ✓          | ✓          |            |                  |
| Zonal Cooling              | ✓           |            |            |            |                  |
| Central Heating            | ✓           | ✓          | ✓          |            |                  |
| Connected Thermostats      | ✓           | ✓          |            |            |                  |
| Connected Consumer Goods   | ✓           |            |            |            |                  |
| Water Heating              | ✓           | ✓          |            |            |                  |
| Electric Vehicle Chargers  | ✓           |            |            |            |                  |
| Pool Pump                  | ✓           | ✓          |            |            |                  |
| Battery Energy Storage     | ✓           | ✓          |            |            | ✓*               |
| Interior Lighting Controls |             | ✓          | ✓          |            | ✓**              |
| Ventilation                |             | ✓          | ✓          |            | ✓**              |
| Refrigeration              |             | ✓          |            |            | ✓**              |
| Thermal Energy Storage     |             | ✓          | ✓          |            | ✓**              |
| Motors and Process         |             |            | ✓          |            | ✓**              |
| Irrigation Pumps           |             |            |            | ✓          |                  |

\* Still under development

\*\* Previously combined into “Third Party Contracts” program



# Demand Response Assessment Methodology

# Transition to Grid Services View of DR

- Previous CPAs have only assessed DR impacts during PacifiCorp's summer and winter system peak periods (Capacity & Energy)
- The 2021 CPA will assess DR's ability to provide value through events beyond peak shaving to align DR's capabilities with PacifiCorp's potential use cases.
- Demand response programs and technologies have been mapped to grid services based on their ability to meet the required performance characteristics of those services

| Market Participation | Grid Services            | DR Products               | Advance Notice (mins) | Full Deployment (mins) | Duration (mins) | CPA Shed Duration |
|----------------------|--------------------------|---------------------------|-----------------------|------------------------|-----------------|-------------------|
| PAC BAA              | Capacity & Energy        | Capacity & Energy         | 55+                   | 55+                    | 60              | Sustained         |
| PAC BAA              | Regulation               | Regulation                | <1-30                 | <30                    | <1-60           | Short             |
| EIM                  | Flexibility & Regulation | EIM Capacity & Energy     | 52.5                  | 60                     | 60+             | Sustained         |
| EIM                  | Flexibility & Regulation | EIM Capacity & Energy FMM | 22.5                  | 15                     | 15+             | Sustained         |
| EIM                  | Flexibility & Regulation | EIM Capacity & Energy RTD | 2.5                   | 5                      | 5+              | Short             |
| PAC BAA              | Non-Spinning Reserves    | Non-Spinning Reserves     | 10                    | 10                     | 60              | Sustained         |
| PAC BAA              | Spinning Reserves        | Spinning Reserves         | <1                    | 10                     | 60              | Sustained         |
| PAC BAA              | Frequency Response       | Frequency Response        | <1                    | <1                     | 1               | Short             |

# Terminology and Key Sources



- **Total Market Size:** Number of applicable pieces of equipment (e.g., Utah residential central air conditioners), tied to energy efficiency forecast
- **Total Hourly Load:** Applicable load in any given hour of the year. Calculated as Total Market Size x average annual consumption, spread over hourly load shape
- **Controllability:** Percent of equipment controllable/eligible for DR, based on energy efficiency forecast and technology characteristics
- **Sheddability:** Fraction of controllable load that can be shed during a DR event
  - Some technologies have different factors for short vs. sustained duration events
  - Informed by LBNL California DR Potential Study, PacifiCorp program experience and draft 2021 Power Plan
- **Program Participation:** Percent of eligible customers assumed to participate
  - Informed by draft 2021 Power Plan and PacifiCorp program experience
- **Participation Ramp Factor (Next Steps):** Annual ramp rate as a % of market potential
  - Previous study assumed 2-year lag and 3-5 year ramp up period for new programs
  - To be informed by program experience, draft 2021 Power Plan assumptions, and IRP timing

# Assessing Customer-Sited Battery Energy Storage for Demand Response

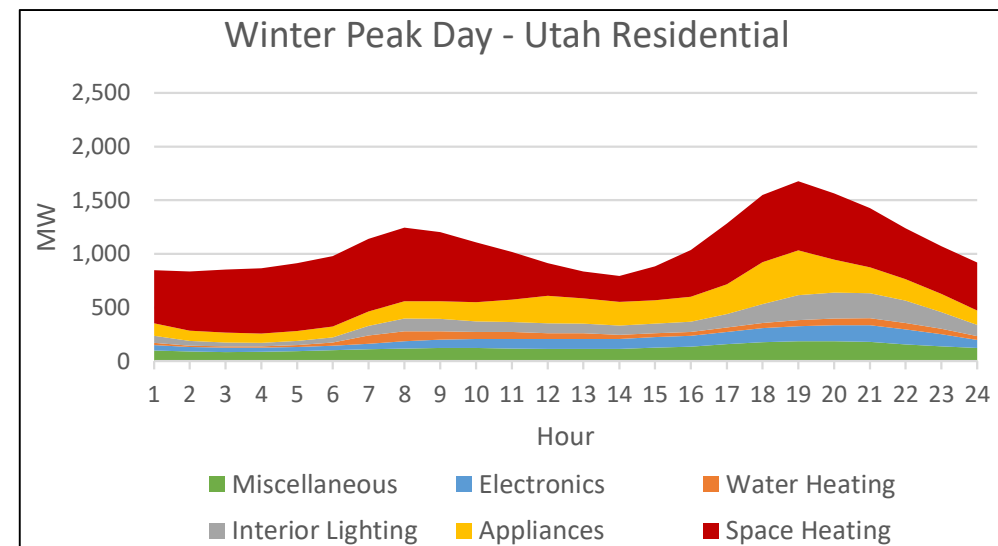
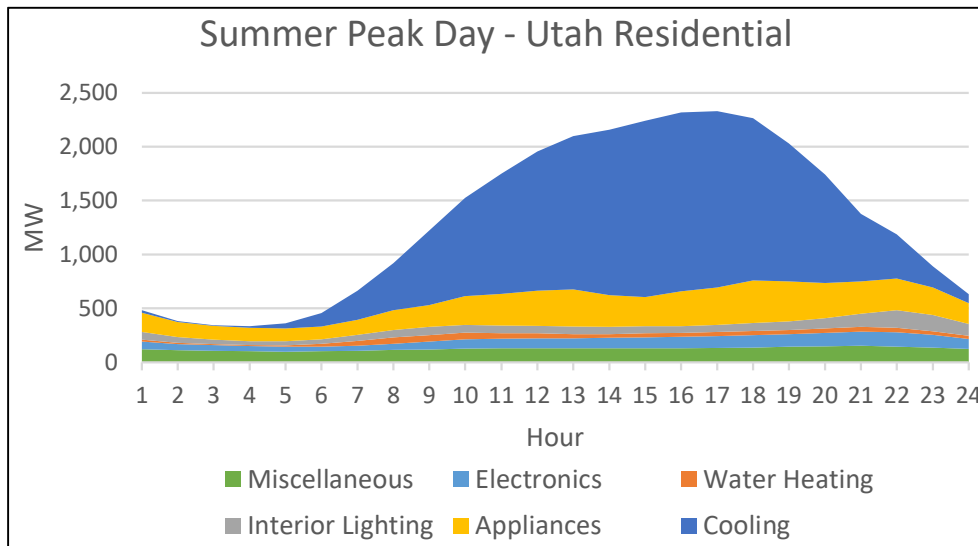
- Modeling customer-sited battery energy storage as a demand response resource is new for the 2021 CPA
- This is a limited use case of energy storage, assessing the potential for PacifiCorp to discharge customer-sited batteries based on the types of events considered in the DR analysis
- Key assumptions in development to assess potential:
  - Program design: “Bring your own” program model, considering lease

| Customer Generation Rate Structure               | Traditional Net Metering               | Time of Export Net Billing                                    |
|--|--|---|
| Customer Storage Benefits                        | Resiliency, Demand Reduction (Non Res) | Maximize Energy Value, Resiliency, Demand Reduction (Non Res) |
| Installation Assumption for Customers with Solar | 20 %                                   | 50 %  |
| Program Participation                            | 50-75 %                                | 50-75 %   |
| Capacity Available for Control                   | 80%                                    | 50% (limited by customer demand)                              |

# Process for Developing DR Potential

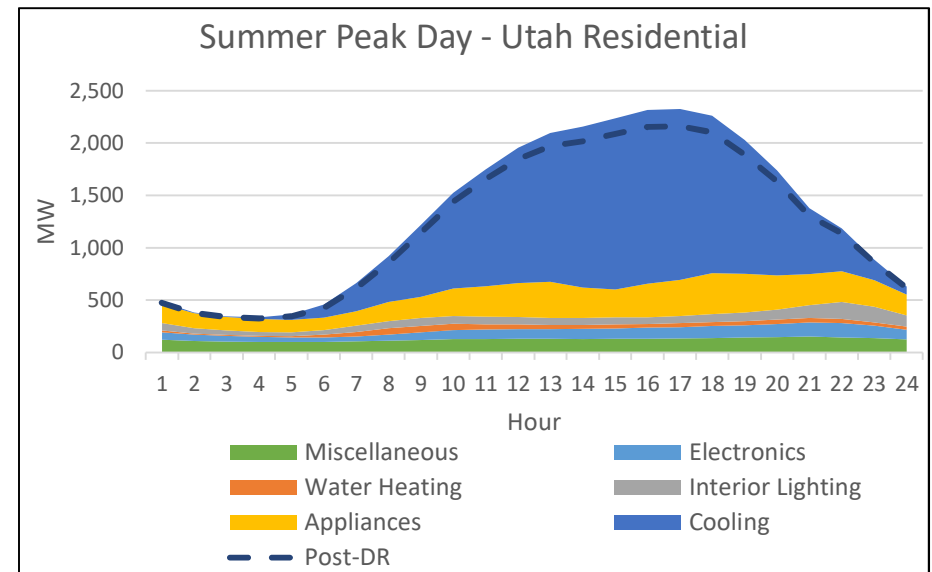


- Step 1. Identify Hourly Market Size by Technology
  - Use same forecast from energy efficiency analysis to identify total market size and associated annual consumption
  - Spread annual consumption over hourly 8760 load shapes to identify estimate load by technology in each hour of the year



# Process for Developing DR Potential (Continued)

- Step 2. Calculate Potential Demand Reduction
  - Identify controllable equipment and apply shed rates (% reduction) to controllable load to identify resource size. Shed rates may vary by event duration
  - Apply participation rates (% of eligible load participating) to identify long-run market potential
  - Account for interaction between competing options to avoid double-counting
  - Apply ramp rates to account for time required to achieve maximum participation
- Step 3. Identify Impacts During Period(s) of Interest
  - Previous studies have only assessed impacts during peak periods, but the value of demand response is evolving
    - Net peak load
    - Grid services
    - Ability to call many short events instead of a few longer events



# Developing Demand Response Resource Costs

- Unlike most energy efficiency programs, where costs are incurred up-front and savings persist over a period of time, demand response resources generally require upfront startup costs plus ongoing costs to continue to realize impacts.
- To account for this, demand response resource costs for IRP modeling are amortized over an assumed contract period
  - For the 2021 IRP, PacifiCorp plans to assume a 5-year amortization period to align with current procurement practices
- As in the 2019 CPA, resource costs for Pacific Power will be based on a Total Resource Cost perspective and Rocky Mountain Power will be based on a Utility Cost Test perspective. The difference is in the treatment of participant costs and incentives:
  - UCT: Count full incentive, exclude participant costs
  - TRC: Count participant costs (capital costs to participant + value of service lost + transaction costs), assumed to be a percentage of the incentive payment. California protocol default is 75% of incentive.
- Levelized costs are typically presented in \$/kW-year, but the available kW value can vary significantly based on the use case, as shown in results slides



# Types of Demand Response Costs



Costs of demand response programs generally fall into three buckets.  
Examples:

| One-Time Fixed Costs                                       | One-Time Variable Costs                 | Ongoing Costs                           |
|--|---|---|
| Program Development Costs<br>(\$/program)                  | Equipment Costs<br>(\$/participant)     | Administrative Costs<br>(shared costs)  |
| DR Management System<br>(DRMS) (shared across<br>programs) | Marketing Costs<br>(\$/participant)     | O&M<br>(\$/participant)                 |
|  | Incentives<br>(\$/participant or \$/kW) | Incentives<br>(\$/participant or \$/kW) |

- In previous studies, certain costs have been shared across states (e.g., program development and administration costs could be shared across RMP or PP states)
- Utility DRMS costs have not been included in the past. Costs to control equipment have been included in vendor costs
- Incentives may be one-time and/or ongoing depending on the program design



# Draft Potential Results

# How to Interpret Potential Results



- Results represent the potential in the 20<sup>th</sup> year of the study – time will be required to ramp up to full participation
- Impacts presented are during PacifiCorp's summer and winter system peaks and may not align with state, sector, or technology peaks
- Potential accounts for interaction between competing resources to avoid double counting (e.g., DLC of central AC and controllable thermostats)
- Potential includes impacts of existing PacifiCorp programs – to be netted out when assessing new resource options within the IRP
- Potential for customer-sited energy storage is still to be added

# Key Trends in Potential Relative to 2019 CPA

- Adoption of grid-enabled technologies create new opportunities for demand response
- Certain end uses and equipment can provide additional potential during short-duration events
- Water heating potential has increased, due to the emergence of grid-interactive equipment, new standards, and the modeling of a standalone control option
- Higher forecasted electric vehicle adoption has increased the potential for control of electric vehicle chargers

# 20-Year Potential Summary - Summer



| MW Impacts – Sustained Duration |             |                           |            |              |                  |
|---------------------------------|-------------|---------------------------|------------|--------------|------------------|
| State                           | Residential | Commercial and Industrial | Irrigation | Total        | % Peak Reduction |
| UT                              | 191         | 127                       | 12         | 330          | 5%               |
| ID                              | 5           | 8                         | 120        | 133          | 28%              |
| WY                              | 5           | 39                        | 1          | 44           | 3%               |
| OR                              | 89          | 56                        | 9          | 154          | 5%               |
| WA                              | 24          | 19                        | 3          | 46           | 5%               |
| CA                              | 3           | 2                         | 2          | 7            | 6%               |
| <b>System</b>                   | <b>318</b>  | <b>252</b>                | <b>146</b> | <b>715</b>   | <b>6%</b>        |
| <b>2019 CPA</b>                 | <b>359</b>  | <b>325</b>                | <b>211</b> | <b>896</b>   |                  |
| MW Impacts – Short-Duration     |             |                           |            |              |                  |
| State                           | Residential | Commercial and Industrial | Irrigation | Total        | % Peak Reduction |
| UT                              | 395         | 141                       | 12         | 548          | 9%               |
| ID                              | 9           | 9                         | 120        | 139          | 29%              |
| WY                              | 9           | 33                        | 1          | 43           | 3%               |
| OR                              | 159         | 62                        | 9          | 229          | 8%               |
| WA                              | 44          | 20                        | 3          | 67           | 7%               |
| CA                              | 5           | 3                         | 2          | 10           | 7%               |
| <b>System</b>                   | <b>622</b>  | <b>268</b>                | <b>146</b> | <b>1,035</b> | <b>9%</b>        |

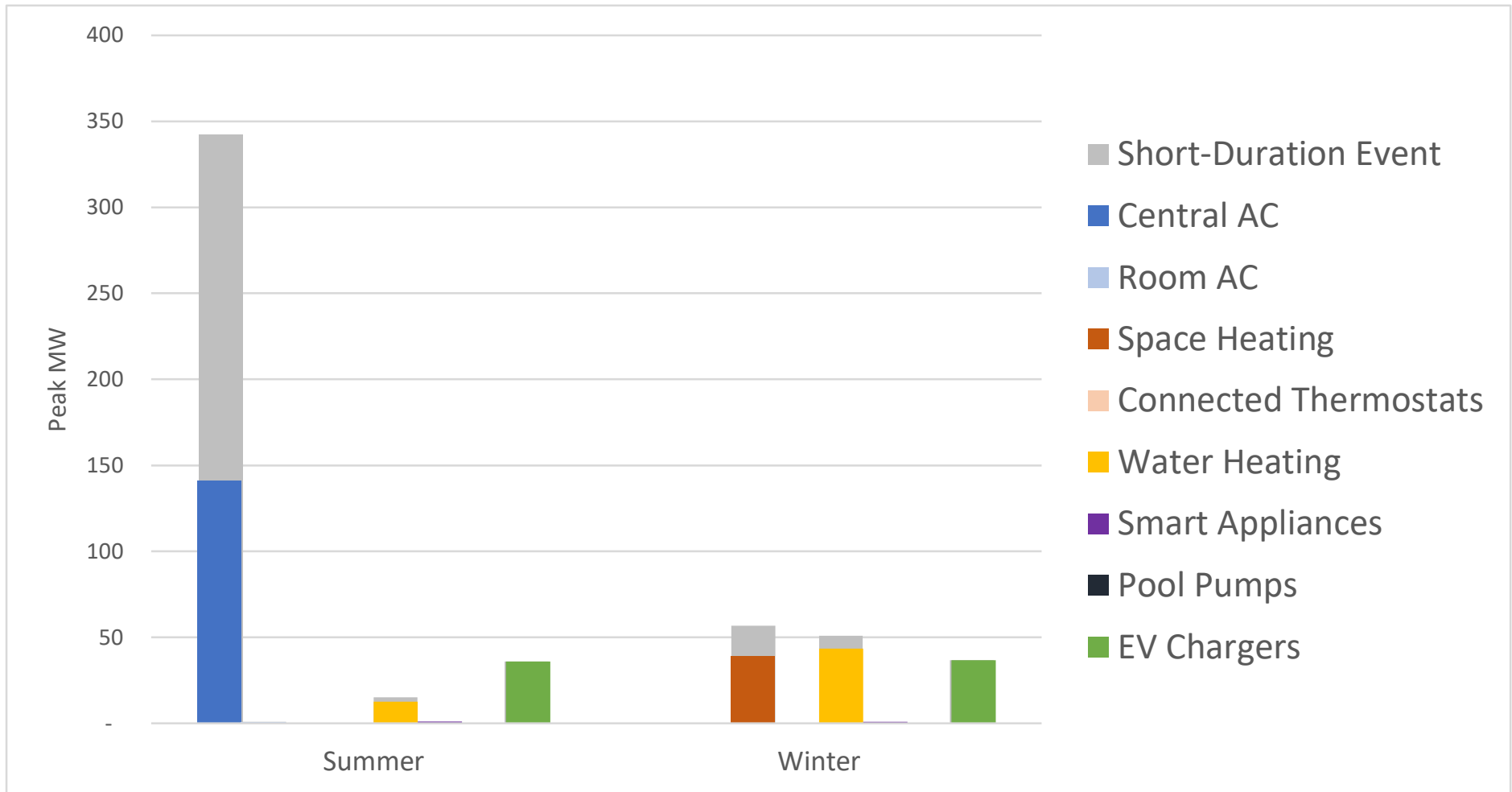
# 20-Year Potential Summary - Winter



| MW Impacts – Sustained Duration |             |                           |            |            |                  |
|---------------------------------|-------------|---------------------------|------------|------------|------------------|
| State                           | Residential | Commercial and Industrial | Irrigation | Total      | % Peak Reduction |
| UT                              | 120         | 99                        | 0          | 219        | 5%               |
| ID                              | 9           | 6                         | 0          | 15         | 4%               |
| WY                              | 9           | 36                        | 0          | 44         | 3%               |
| OR                              | 107         | 50                        | 0          | 157        | 5%               |
| WA                              | 30          | 16                        | 0          | 46         | 5%               |
| CA                              | 7           | 2                         | 0          | 8          | 5%               |
| <b>System</b>                   | <b>283</b>  | <b>207</b>                | <b>0</b>   | <b>490</b> | <b>5%</b>        |
| <b>2019 CPA</b>                 | <b>286</b>  | <b>173</b>                | <b>0</b>   | <b>459</b> |                  |

| MW Impacts – Short-Duration |             |                           |            |            |                  |
|-----------------------------|-------------|---------------------------|------------|------------|------------------|
| State                       | Residential | Commercial and Industrial | Irrigation | Total      | % Peak Reduction |
| UT                          | 145         | 98                        | 0          | 243        | 5%               |
| ID                          | 12          | 6                         | 0          | 18         | 5%               |
| WY                          | 11          | 28                        | 0          | 40         | 3%               |
| OR                          | 167         | 51                        | 0          | 218        | 6%               |
| WA                          | 38          | 15                        | 0          | 53         | 5%               |
| CA                          | 8           | 2                         | 0          | 10         | 6%               |
| <b>System</b>               | <b>382</b>  | <b>200</b>                | <b>0</b>   | <b>583</b> | <b>5%</b>        |

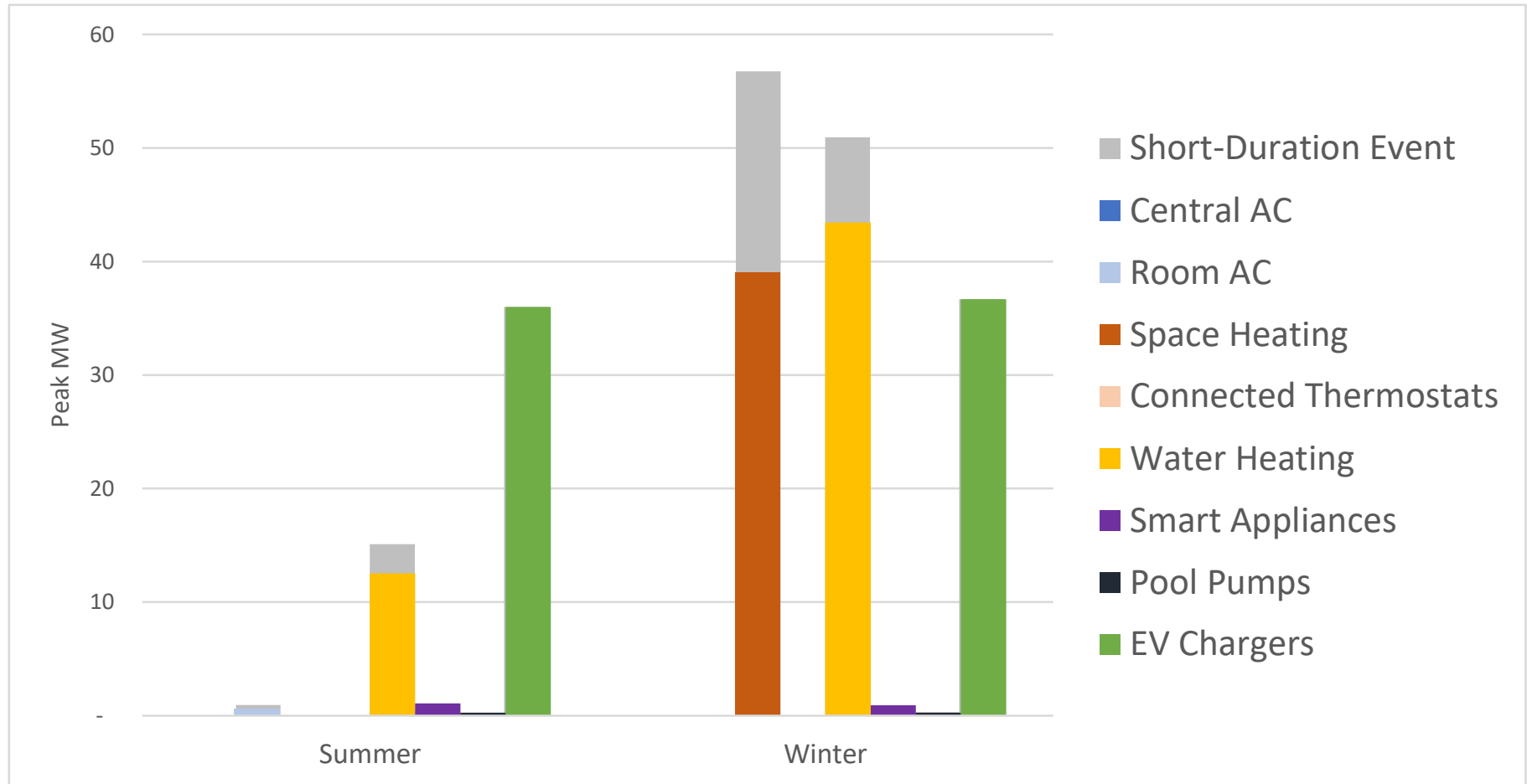
# 20-Year Potential: Utah Residential



\* The assumption in RMP states is that potential for central cooling and heating would be captured through switches, not connected thermostats.

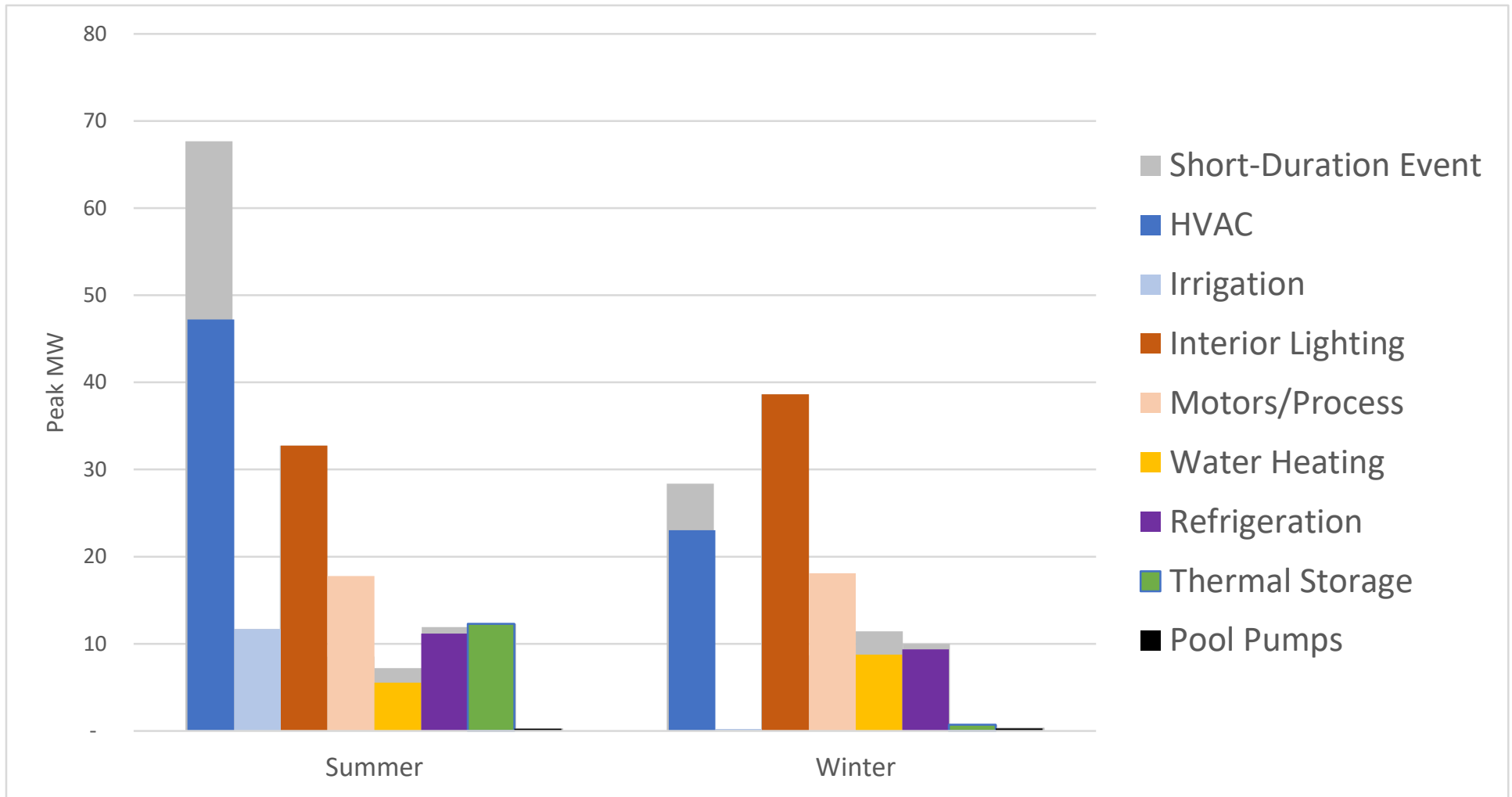


# 20-Year Potential: Utah Residential, Excluding Cool Keeper

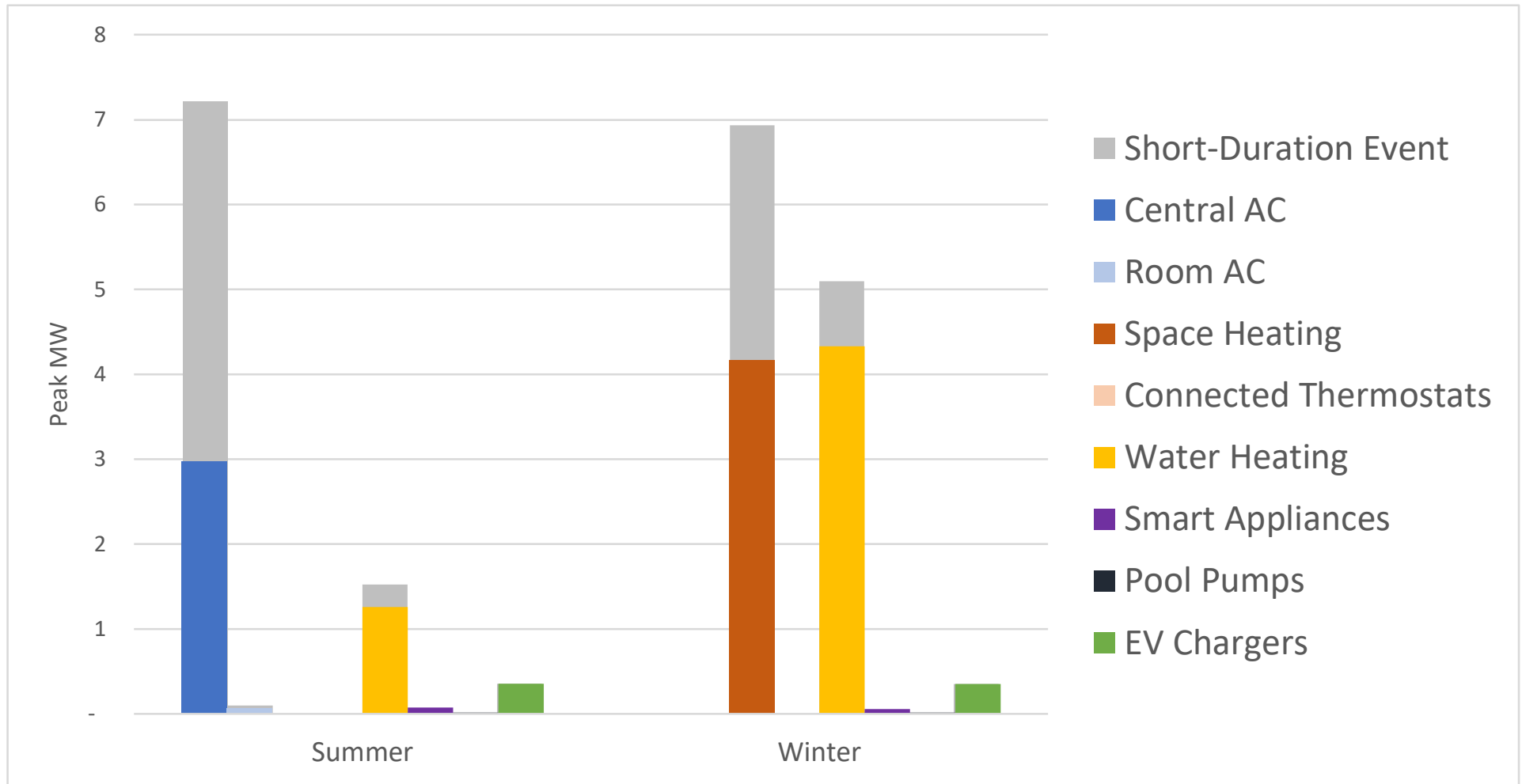


\* The assumption in RMP states is that potential for central cooling and heating would be captured through switches, not connected thermostats.

# 20-Year Potential: Utah Non-Residential

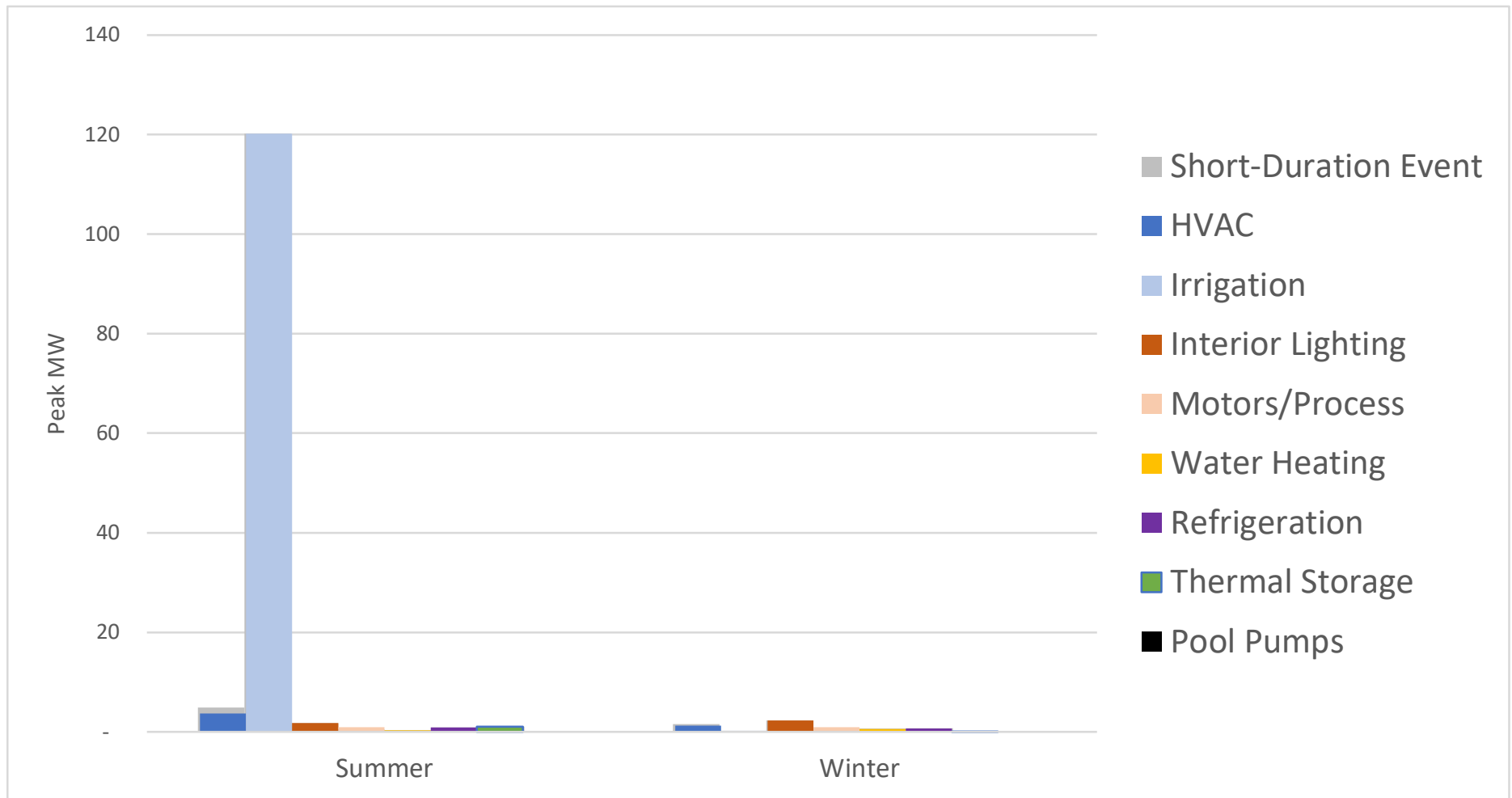


# 20-Year Potential: Idaho Residential

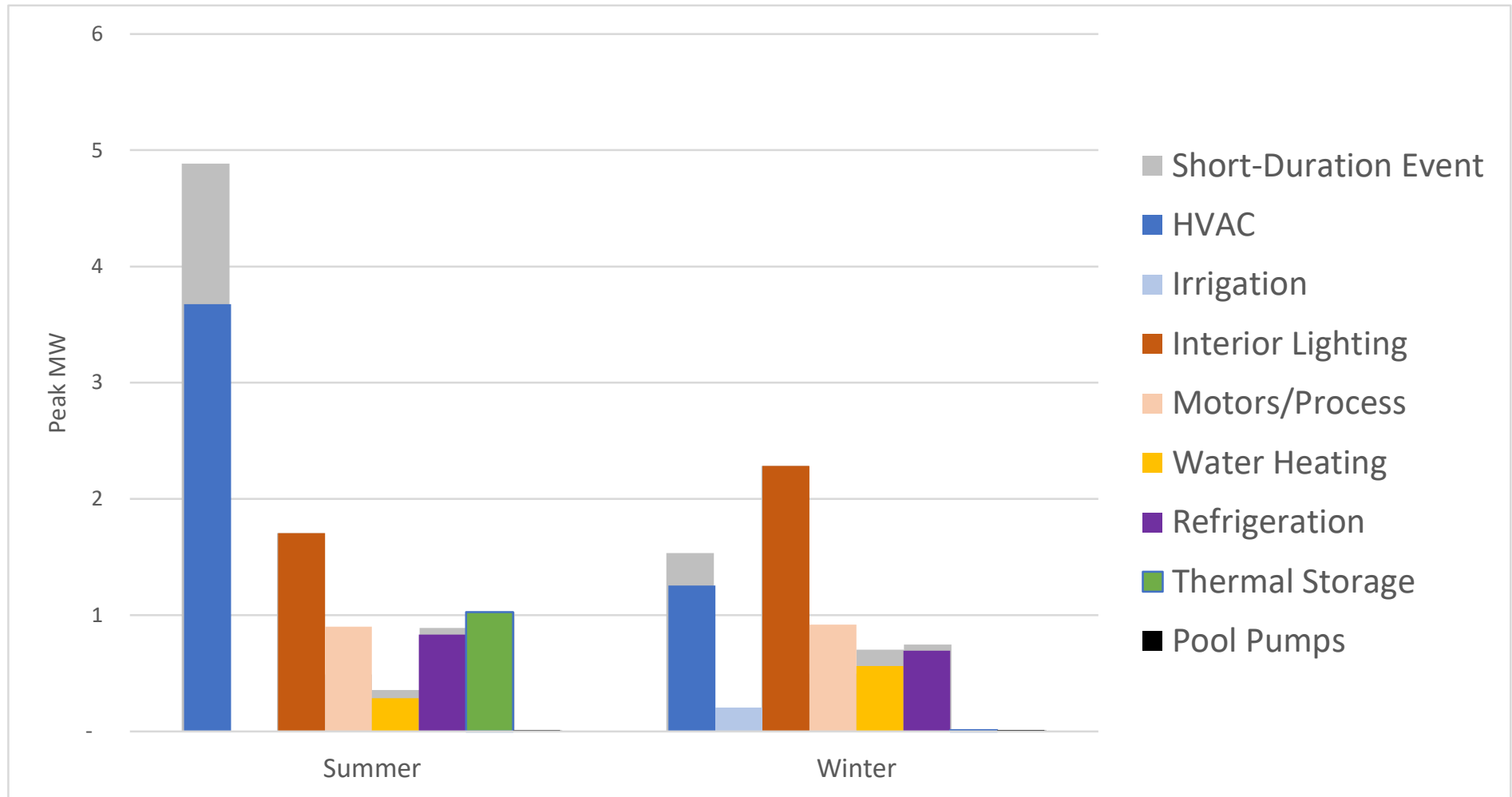


\* The assumption in RMP states is that potential for central cooling and heating would be captured through switches, not connected thermostats.

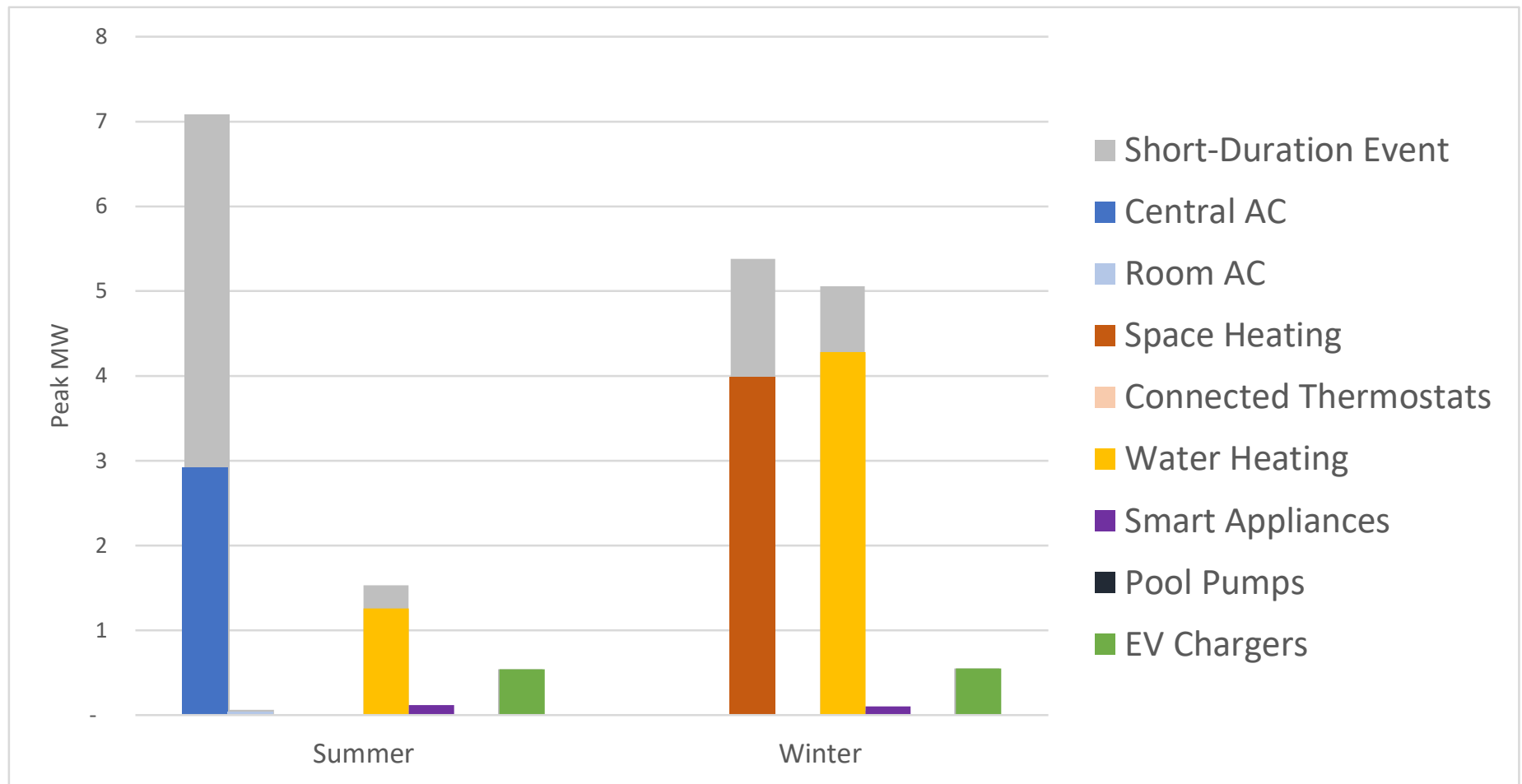
# 20-Year Potential: Idaho Non-Residential



# 20-Year Potential: Idaho Non-Residential, Excluding Irrigation Load Control

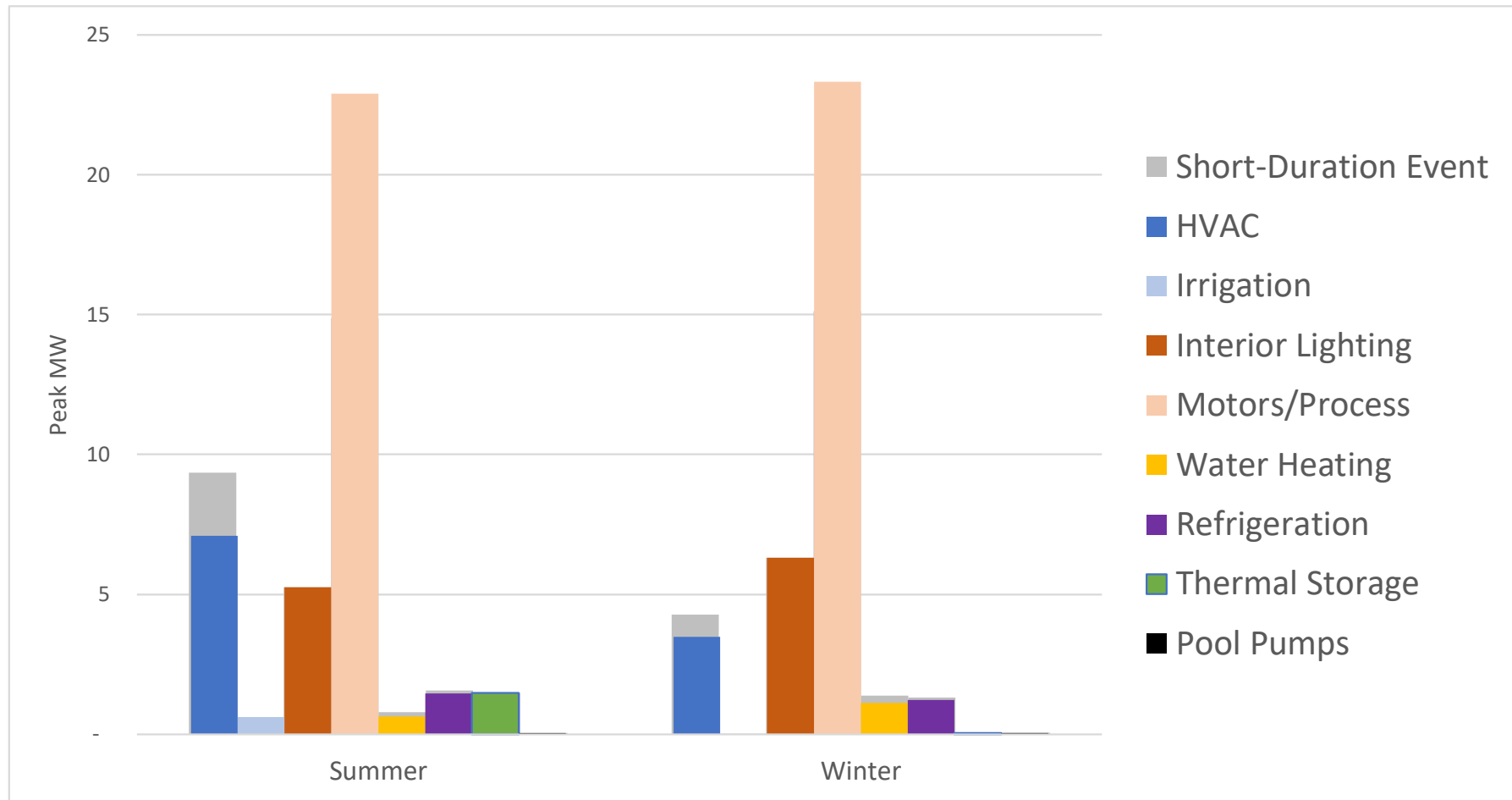


# 20-Year Potential: Wyoming Residential



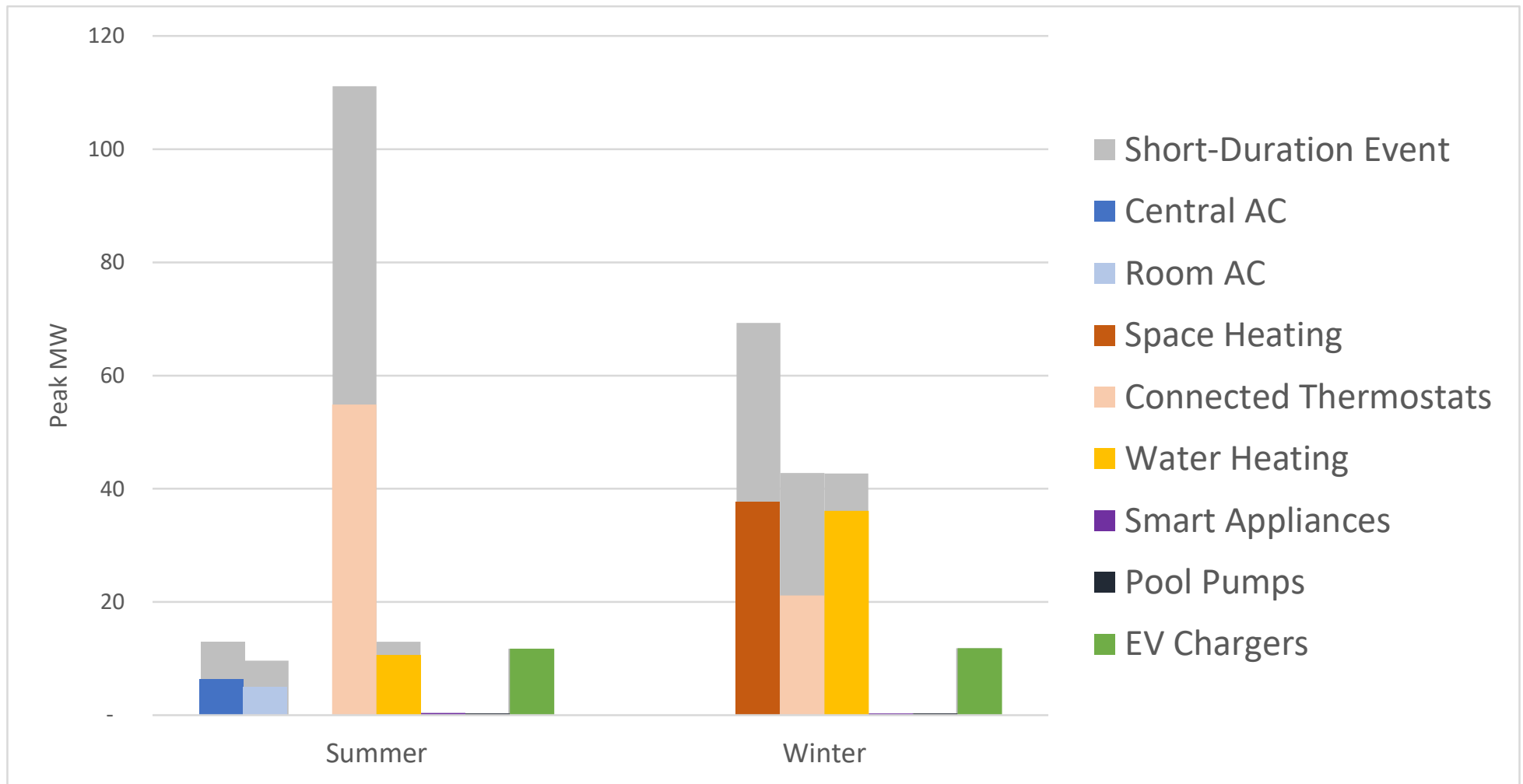
\* The assumption in RMP states is that potential for central cooling and heating would be captured through switches, not connected thermostats.

# 20-Year Potential: Wyoming Non-Residential

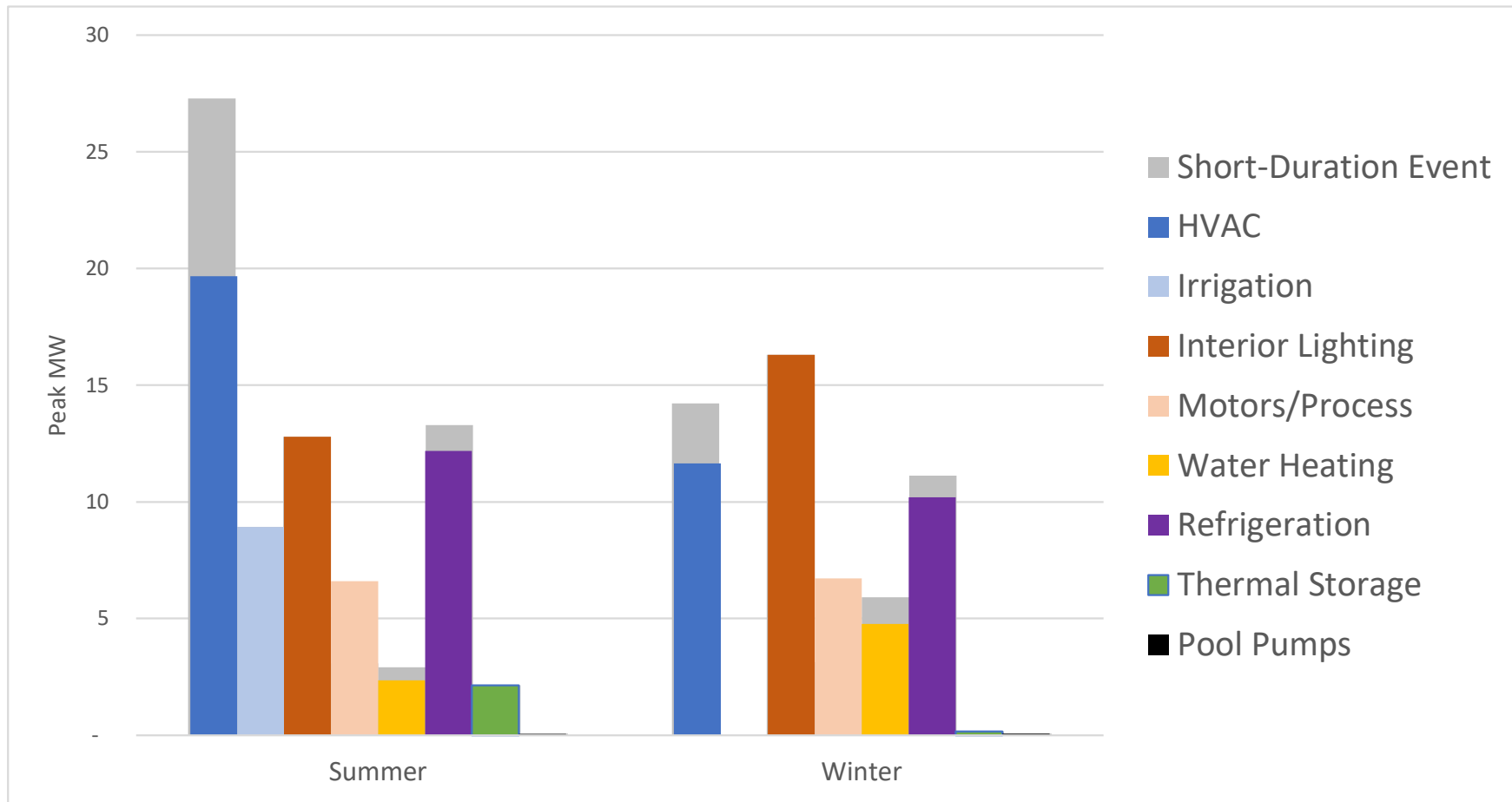




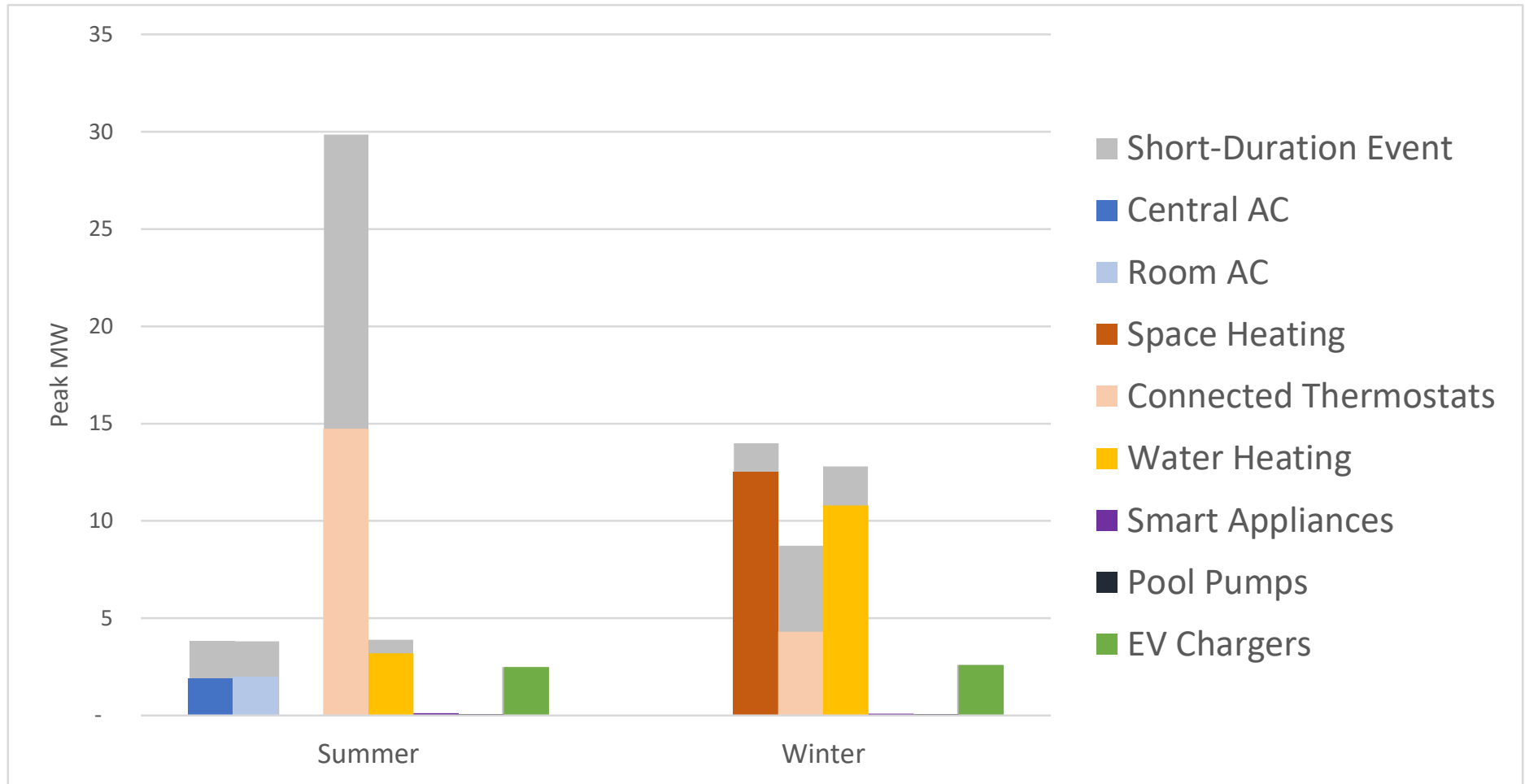
# 20-Year Potential: Oregon Residential



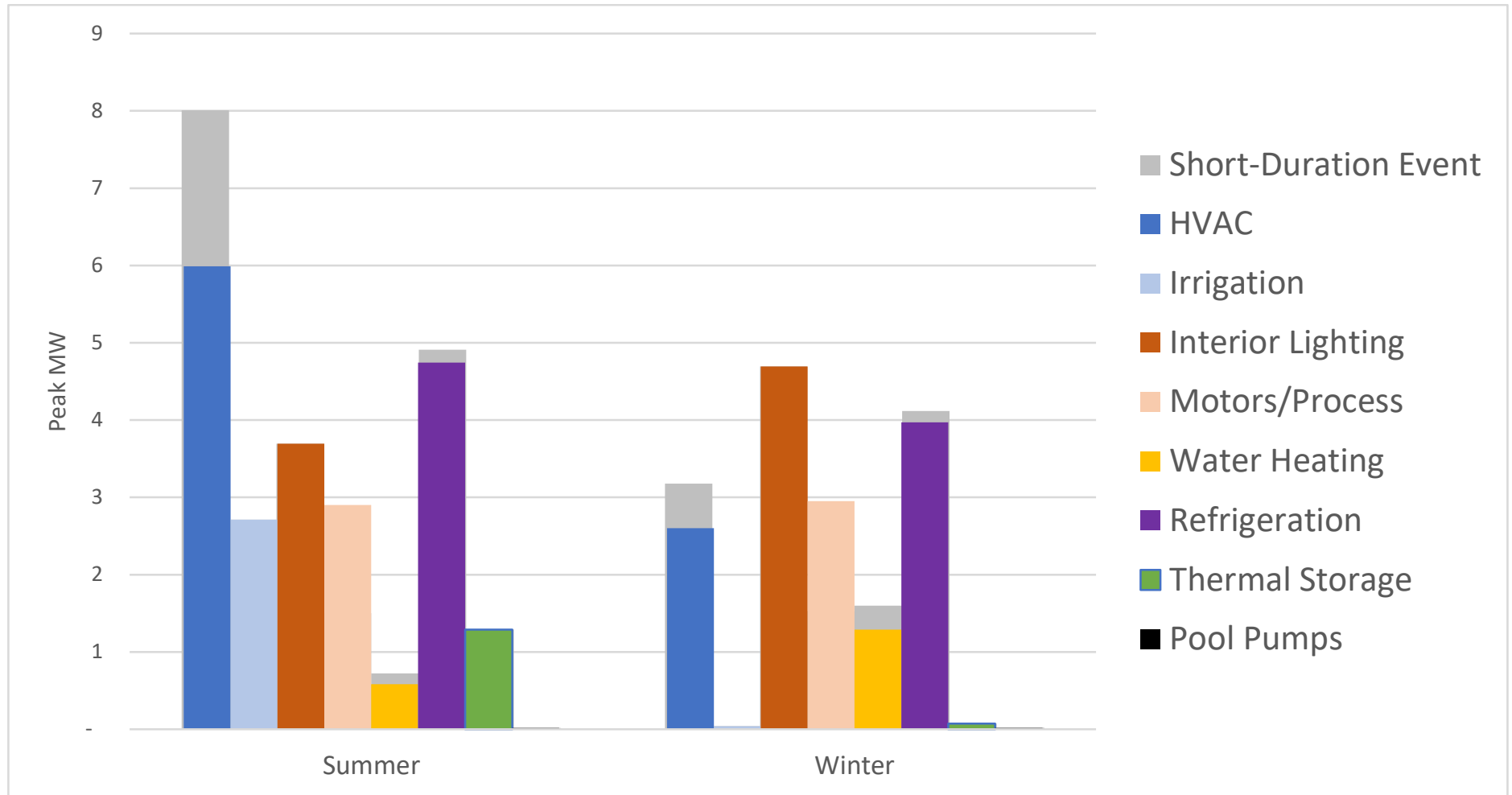
# 20-Year Potential: Oregon Non-Residential



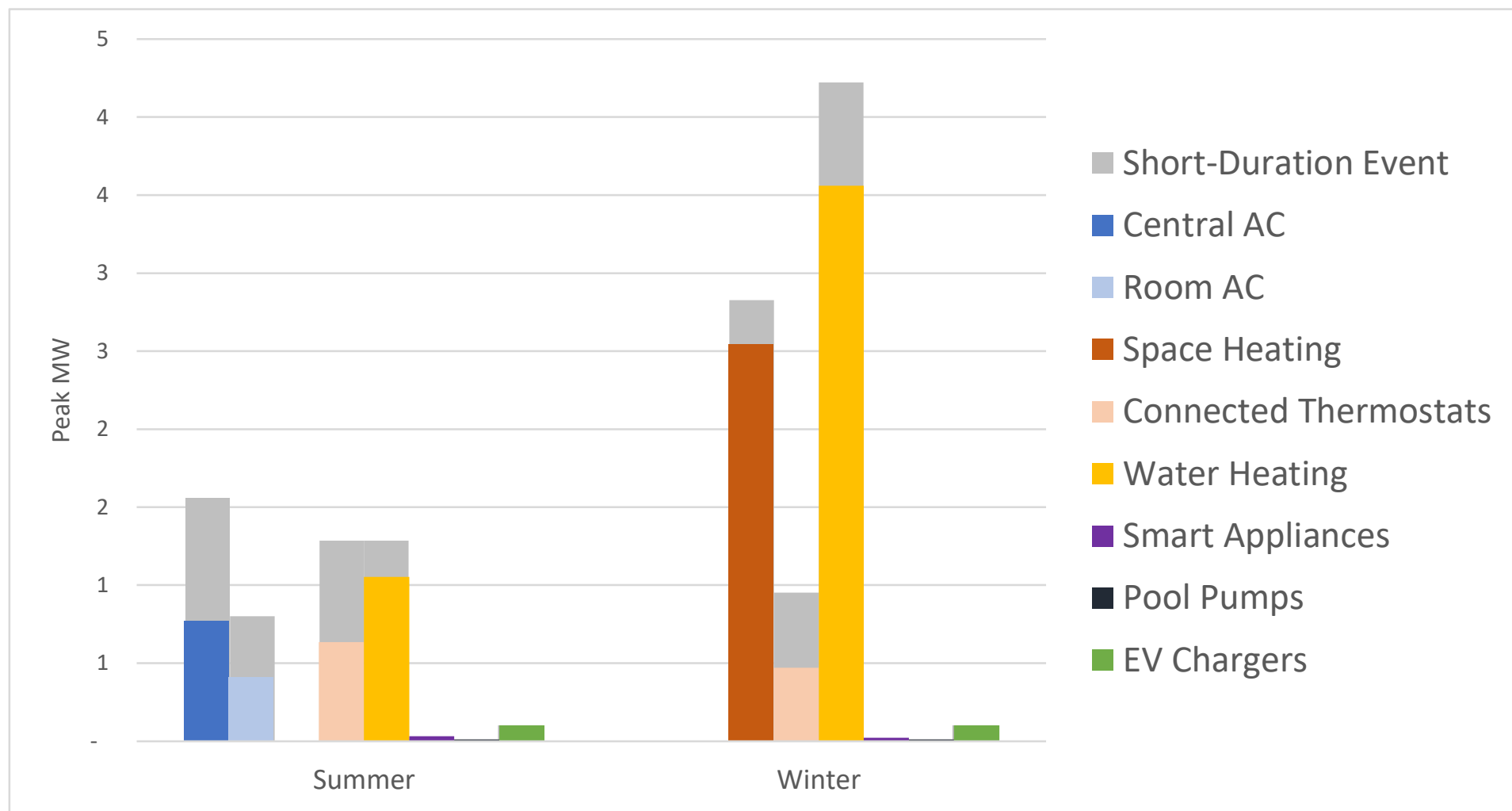
# 20-Year Potential: Washington Residential



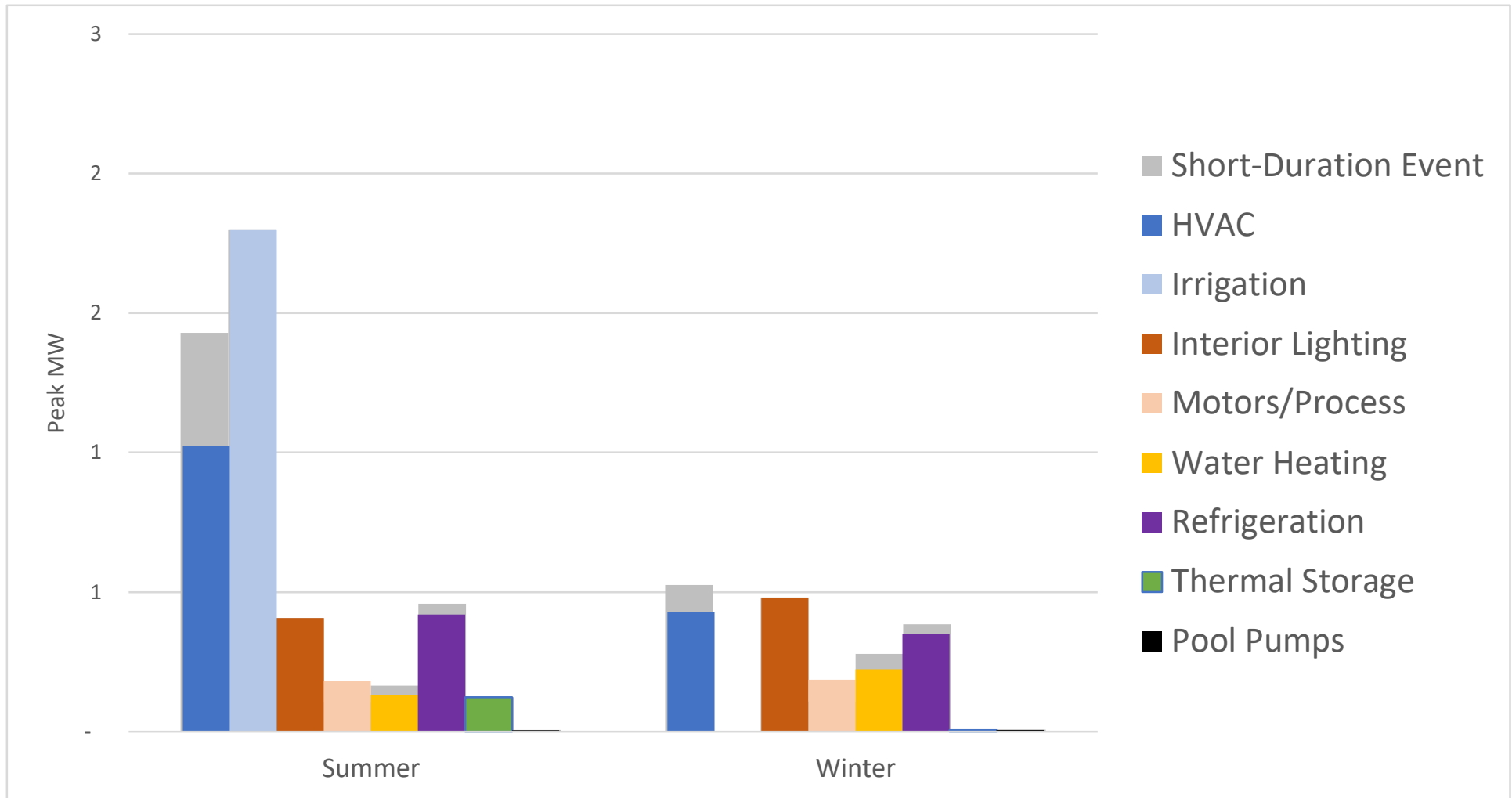
# 20-Year Potential: Washington Non-Residential



# 20-Year Potential: California Residential



# 20-Year Potential: California Non-Residential



# Demand Response RFP Update



- Oregon Order No. 20-186 related to acknowledgement of the 2019 IRP directed PacifiCorp to issue a DR RFP
- Scope for Pacific Power (OR, WA, CA)
- Conduct 1-2 meetings with non-bidding stakeholders as per OR IRP order to discuss program/pilot consideration (late Sept., Oct.)
  - “Working with non-bidding stakeholders to assess the DR results and whether they indicate that PacifiCorp should:*
    - Proceed with available cost-effective winning DR bids, or*
    - Move forward with a DR pilot if no cost-effective DR is yet available, or*
    - Move forward with both cost-effective DR and a DR pilot”*
- January 2021 release, final bids evaluated with AS 2020 RFP bids spring 2021





# Additional Information/ Next Steps



# Additional Information



- Public Input Meeting and Workshop Presentation and Materials:
  - [pacificorp.com/energy/integrated-resource-plan/public-input-process](https://pacificorp.com/energy/integrated-resource-plan/public-input-process)
- 2021 IRP Stakeholder Feedback Forms:
  - [pacificorp.com/energy/integrated-resource-plan/comments](https://pacificorp.com/energy/integrated-resource-plan/comments)
- IRP Email / Distribution List Contact Information:
  - [IRP@PacifiCorp.com](mailto:IRP@PacifiCorp.com)
- IRP Support and Studies – CPA Draft Documents
  - [pacificorp.com/energy/integrated-resource-plan/support](https://pacificorp.com/energy/integrated-resource-plan/support)

# Next Steps



- Upcoming Public Input Meeting Dates:
  - September 17-18, 2020 – Public Input Meeting
  - October 22-23, 2020 – Public Input Meeting
  - December 3-4, 2020 – Public Input Meeting
  - January 14-15, 2021 – Public Input Meeting
  - February 25-26, 2021 – Public Input Meeting

*\*meeting dates are subject to change*