



2018 NorthWestern Energy Montana 20-Year Load Forecast
ETAC February 28, 2018 (Subject to Revision)

NorthWestern[®]
Energy
Delivering a Bright Future



Peak and Energy Forecast Drivers (modeled)

1. Customer forecast
2. Normal weather forecast
3. Demand Side Management (DSM) and
Navigant Net Energy Metering (NEM) forecast

Peak and Energy Forecasts

4. Peak demand forecast
5. Energy forecast
6. Past load forecasts review



1. Customer forecast



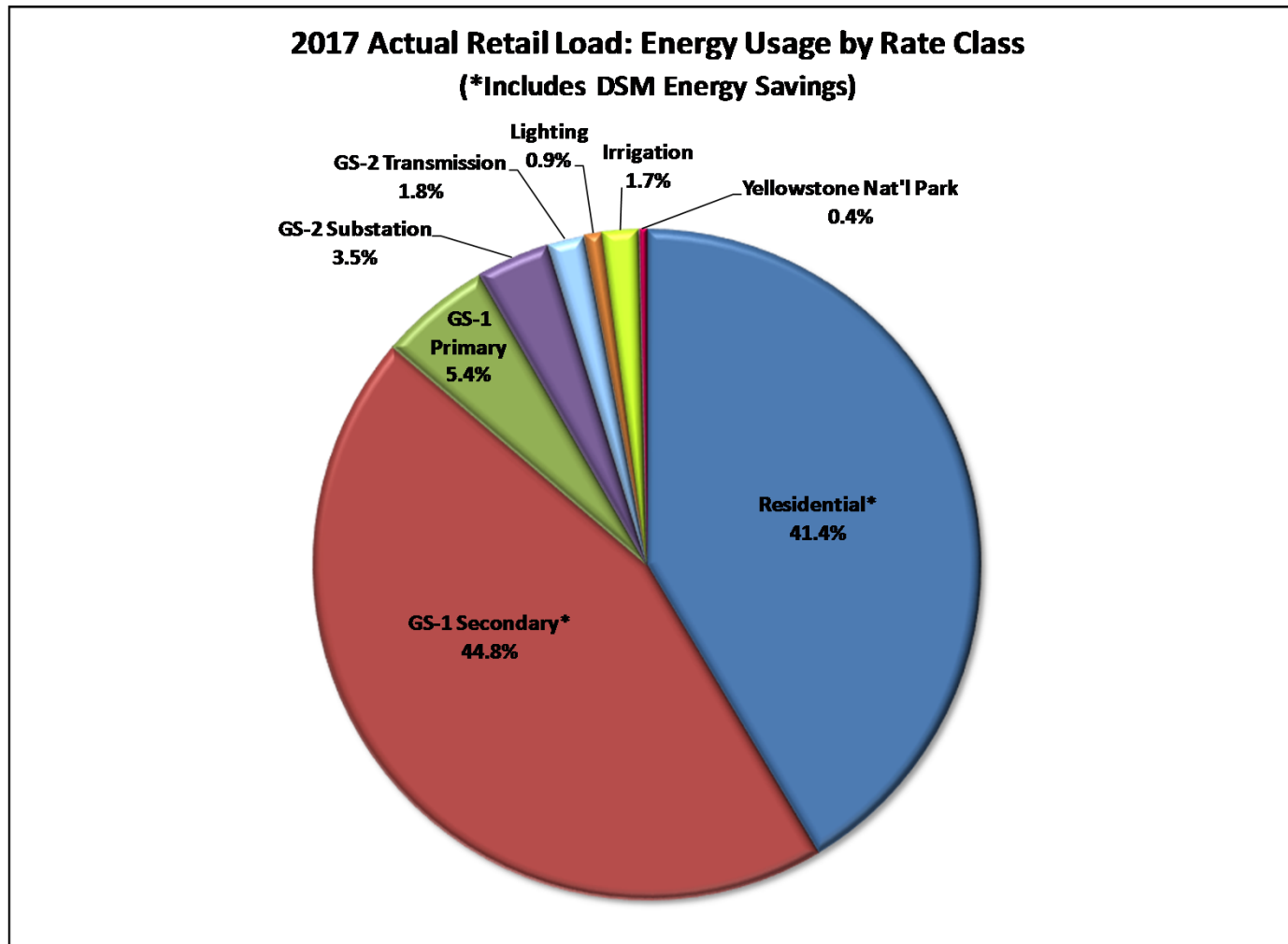
Customer forecast methodology

Customer Forecast

- Population Forecast
 - Woods & Poole Economics
 - Montana and NWE service territory forecasted population growth rate: 20-year average 0.9% but marginally declines throughout forecast
- Customer Forecast Methodology
 - Residential & GS1 Secondary customer forecasts are based on regression models using NWE service territory population and, for GS1 Secondary, service territory total employment as the explanatory variables
 - GS1 Primary customers grow at 1 customer per year to reflect historical growth
 - All other customer classes held constant at 2017 actual levels

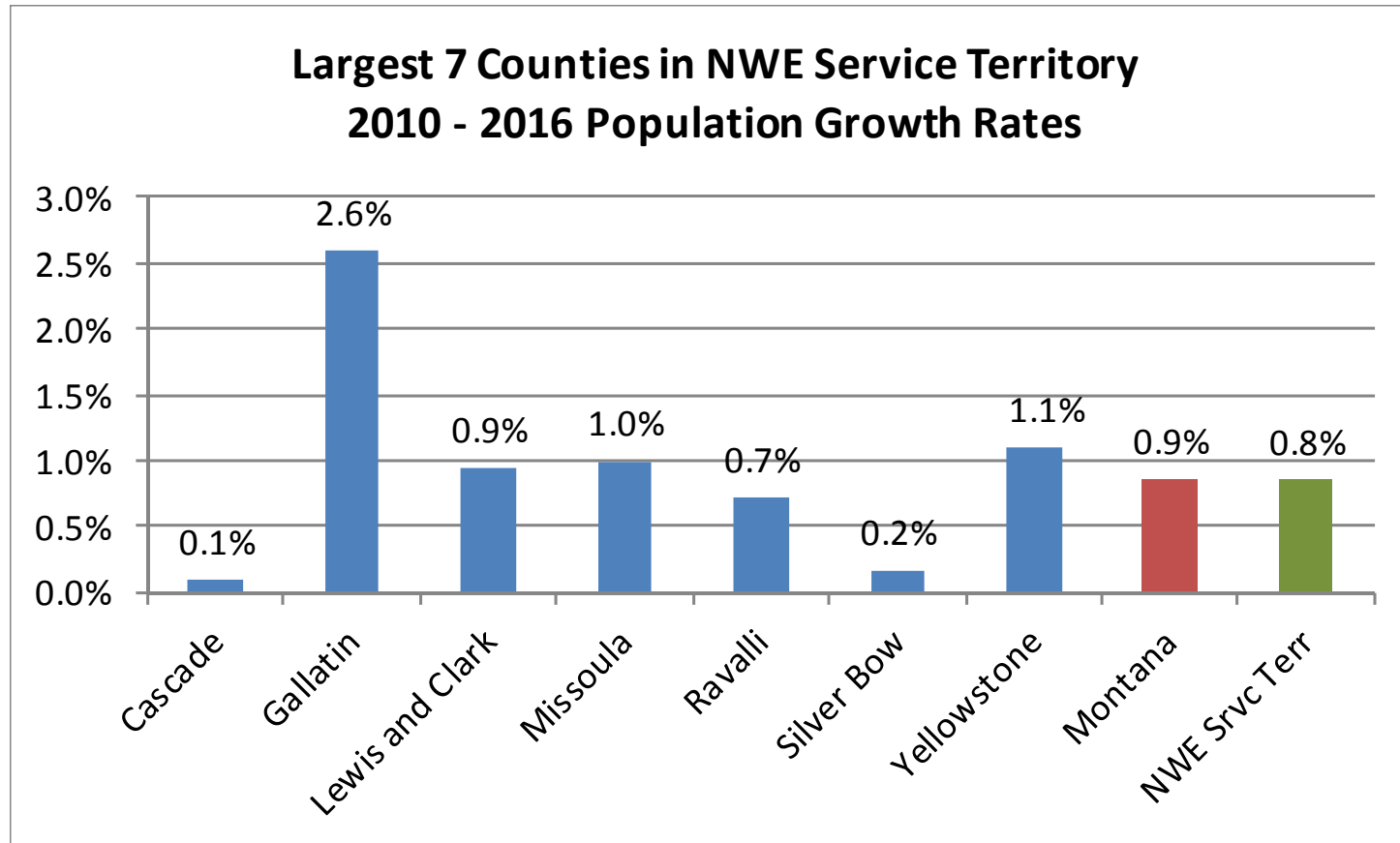


2017 Default Supply load by class



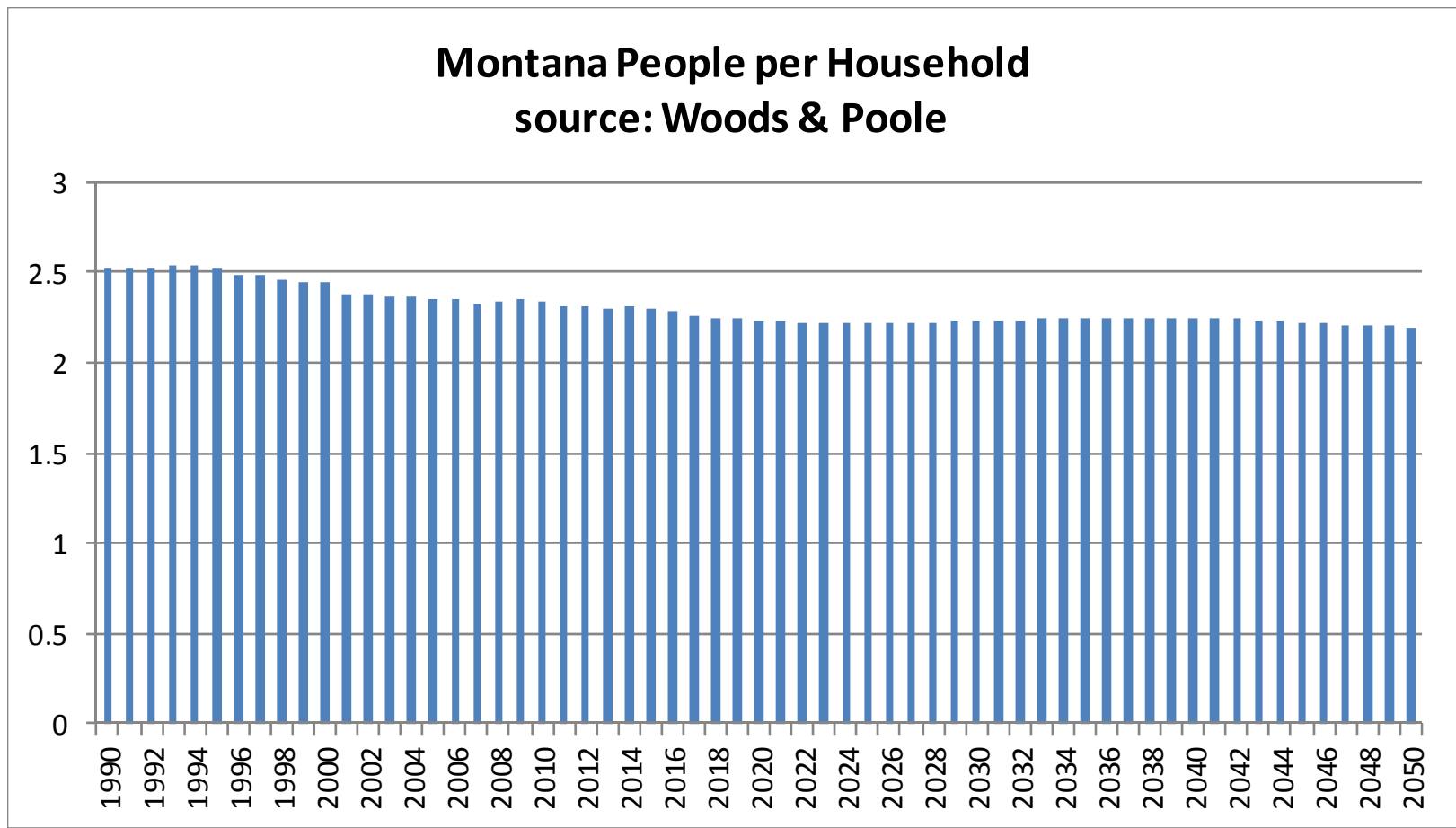


NWE service territory population drivers





Montana people per household





NWE MT population projection scenarios

2018 Montana Population Forecast Scenarios

| | LOW CASE 1/2 Base Case Growth | | | BASE CASE Woods & Poole Projection | | | HIGH CASE 1 1/2 Base Case Growth | | |
|---------------|----------------------------------|----------|---------|---------------------------------------|----------|---------|-------------------------------------|----------|---------|
| | MT Pop | % Growth | Net Inc | MT Pop | % Growth | Net Inc | MT Pop | % Growth | Net Inc |
| 2017 | 1,051,408 | 0.9% | 9,660 | 1,051,408 | 0.9% | 9,660 | 1,051,408 | 0.9% | 9,660 |
| 2018 | 1,056,287 | 0.5% | 4,879 | 1,061,165 | 0.9% | 9,757 | 1,066,044 | 1.4% | 14,635 |
| 2019 | 1,061,197 | 0.5% | 4,910 | 1,071,031 | 0.9% | 9,866 | 1,080,911 | 1.4% | 14,867 |
| 2020 | 1,066,125 | 0.5% | 4,928 | 1,080,979 | 0.9% | 9,948 | 1,095,970 | 1.4% | 15,060 |
| 2021 | 1,071,082 | 0.5% | 4,956 | 1,091,030 | 0.9% | 10,051 | 1,111,256 | 1.4% | 15,286 |
| 2022 | 1,076,058 | 0.5% | 4,976 | 1,101,168 | 0.9% | 10,138 | 1,126,745 | 1.4% | 15,489 |
| 2023 | 1,081,051 | 0.5% | 4,993 | 1,111,388 | 0.9% | 10,220 | 1,142,431 | 1.4% | 15,686 |
| 2024 | 1,086,064 | 0.5% | 5,012 | 1,121,694 | 0.9% | 10,306 | 1,158,322 | 1.4% | 15,891 |
| 2025 | 1,091,080 | 0.5% | 5,016 | 1,132,055 | 0.9% | 10,361 | 1,174,371 | 1.4% | 16,049 |
| 2026 | 1,096,093 | 0.5% | 5,013 | 1,142,458 | 0.9% | 10,403 | 1,190,558 | 1.4% | 16,188 |
| 2027 | 1,101,097 | 0.5% | 5,004 | 1,152,889 | 0.9% | 10,431 | 1,206,864 | 1.4% | 16,305 |
| 2028 | 1,106,089 | 0.5% | 4,992 | 1,163,343 | 0.9% | 10,454 | 1,223,279 | 1.4% | 16,415 |
| 2029 | 1,111,067 | 0.5% | 4,978 | 1,173,815 | 0.9% | 10,472 | 1,239,796 | 1.4% | 16,517 |
| 2030 | 1,116,034 | 0.4% | 4,967 | 1,184,310 | 0.9% | 10,495 | 1,256,423 | 1.3% | 16,627 |
| 2031 | 1,120,913 | 0.4% | 4,879 | 1,194,664 | 0.9% | 10,354 | 1,272,900 | 1.3% | 16,477 |
| 2032 | 1,125,700 | 0.4% | 4,787 | 1,204,868 | 0.9% | 10,204 | 1,289,208 | 1.3% | 16,308 |
| 2033 | 1,130,411 | 0.4% | 4,711 | 1,214,952 | 0.8% | 10,084 | 1,305,393 | 1.3% | 16,185 |
| 2034 | 1,135,044 | 0.4% | 4,633 | 1,224,911 | 0.8% | 9,959 | 1,321,444 | 1.2% | 16,051 |
| 2035 | 1,139,600 | 0.4% | 4,556 | 1,234,745 | 0.8% | 9,834 | 1,337,357 | 1.2% | 15,913 |
| 2036 | 1,144,087 | 0.4% | 4,487 | 1,244,468 | 0.8% | 9,723 | 1,353,154 | 1.2% | 15,797 |
| 2037 | 1,148,511 | 0.4% | 4,424 | 1,254,092 | 0.8% | 9,624 | 1,368,851 | 1.2% | 15,697 |
| 2038 | 1,152,872 | 0.4% | 4,362 | 1,263,617 | 0.8% | 9,525 | 1,384,445 | 1.1% | 15,595 |
| 2019-2038 Avg | | 0.4% | 4,829 | | 0.9% | 10,123 | | 1.3% | 15,920 |
| 1998-2017 Avg | | 0.9% | 8,367 | | 0.9% | 8,367 | | 0.9% | 8,367 |

Montana averaged 8,367 net new people 1998-2017.



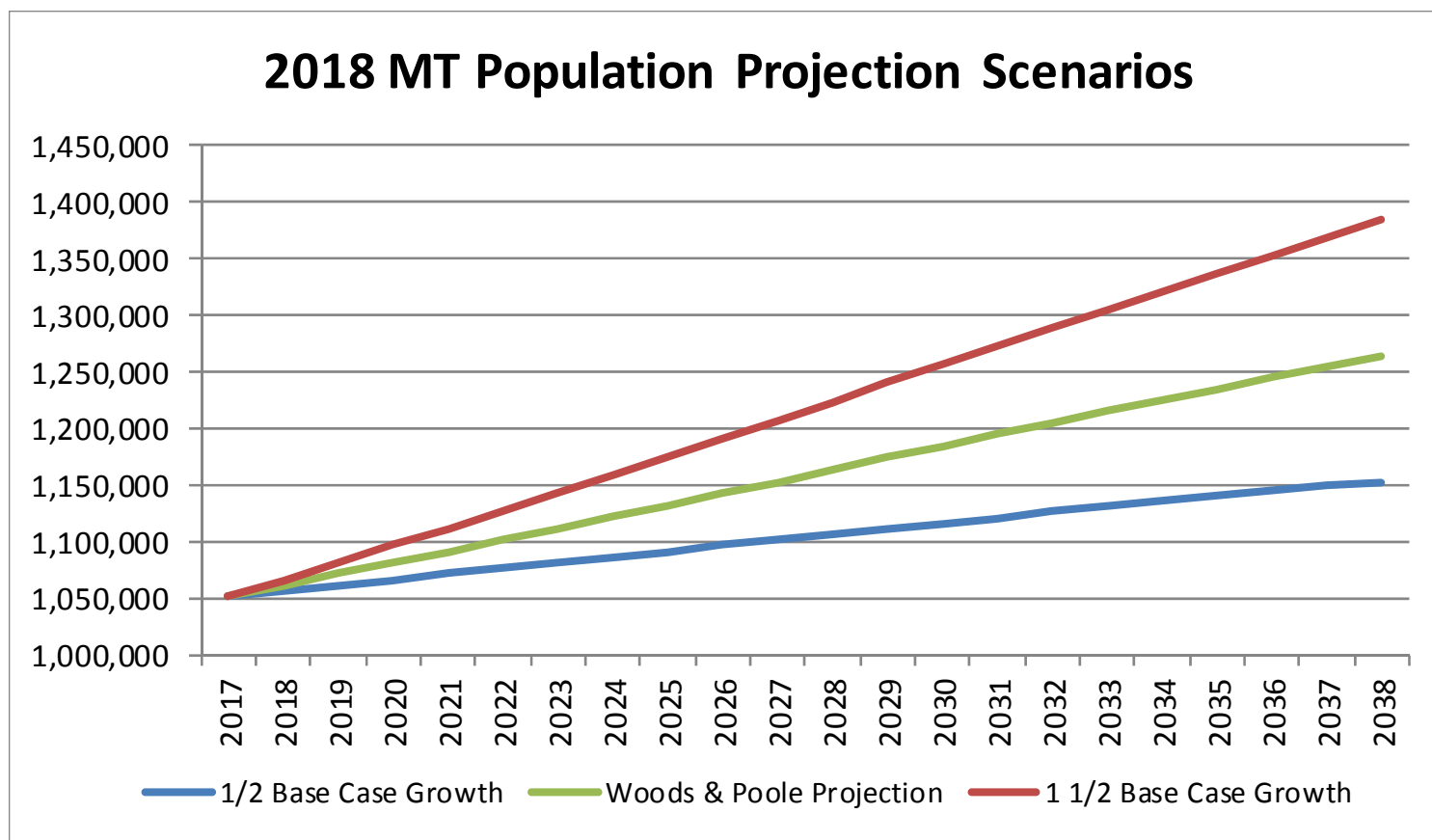
NWE service territory population projections

2018 NorthWestern Energy Service Territory Population Forecast Scenarios

| | LOW CASE | | | BASE CASE | | | HIGH CASE | | |
|---------------|----------------------|----------|---------|--------------------------|----------|---------|------------------------|----------|---------|
| | 1/2 Base Case Growth | | | Woods & Poole Projection | | | 1 1/2 Base Case Growth | | |
| | NWE ST | % Growth | Net Inc | NWE ST | % Growth | Net Inc | NWE ST | % Growth | Net Inc |
| 2017 | 821,247 | 0.9% | 7,572 | 821,247 | 0.9% | 7,572 | 821,247 | 0.9% | 7,572 |
| 2018 | 825,072 | 0.5% | 3,825 | 828,897 | 0.9% | 7,650 | 832,722 | 1.4% | 11,475 |
| 2019 | 828,919 | 0.5% | 3,847 | 836,627 | 0.9% | 7,730 | 844,371 | 1.4% | 11,649 |
| 2020 | 832,778 | 0.5% | 3,859 | 844,416 | 0.9% | 7,789 | 856,162 | 1.4% | 11,792 |
| 2021 | 836,657 | 0.5% | 3,879 | 852,283 | 0.9% | 7,867 | 868,127 | 1.4% | 11,965 |
| 2022 | 840,552 | 0.5% | 3,895 | 860,218 | 0.9% | 7,935 | 880,251 | 1.4% | 12,124 |
| 2023 | 844,458 | 0.5% | 3,906 | 868,213 | 0.9% | 7,995 | 892,522 | 1.4% | 12,272 |
| 2024 | 848,376 | 0.5% | 3,918 | 876,270 | 0.9% | 8,057 | 904,946 | 1.4% | 12,424 |
| 2025 | 852,296 | 0.5% | 3,920 | 884,368 | 0.9% | 8,098 | 917,491 | 1.4% | 12,545 |
| 2026 | 856,212 | 0.5% | 3,916 | 892,494 | 0.9% | 8,126 | 930,136 | 1.4% | 12,646 |
| 2027 | 860,120 | 0.5% | 3,908 | 900,642 | 0.9% | 8,148 | 942,874 | 1.4% | 12,737 |
| 2028 | 864,017 | 0.5% | 3,897 | 908,803 | 0.9% | 8,161 | 955,689 | 1.4% | 12,816 |
| 2029 | 867,902 | 0.4% | 3,885 | 916,976 | 0.9% | 8,173 | 968,581 | 1.3% | 12,892 |
| 2030 | 871,777 | 0.4% | 3,874 | 925,163 | 0.9% | 8,187 | 981,553 | 1.3% | 12,972 |
| 2031 | 875,580 | 0.4% | 3,803 | 933,235 | 0.9% | 8,072 | 994,399 | 1.3% | 12,846 |
| 2032 | 879,310 | 0.4% | 3,730 | 941,187 | 0.9% | 7,952 | 1,007,109 | 1.3% | 12,710 |
| 2033 | 882,978 | 0.4% | 3,668 | 949,039 | 0.8% | 7,852 | 1,019,712 | 1.3% | 12,603 |
| 2034 | 886,586 | 0.4% | 3,608 | 956,795 | 0.8% | 7,756 | 1,032,212 | 1.2% | 12,500 |
| 2035 | 890,132 | 0.4% | 3,546 | 964,449 | 0.8% | 7,654 | 1,044,598 | 1.2% | 12,386 |
| 2036 | 893,623 | 0.4% | 3,490 | 972,012 | 0.8% | 7,563 | 1,056,885 | 1.2% | 12,287 |
| 2037 | 897,061 | 0.4% | 3,438 | 979,492 | 0.8% | 7,480 | 1,069,085 | 1.2% | 12,200 |
| 2038 | 900,450 | 0.4% | 3,389 | 986,893 | 0.8% | 7,401 | 1,081,202 | 1.1% | 12,117 |
| 2019-2038 Avg | | 0.4% | 3,769 | | 0.9% | 7,900 | | 1.3% | 12,424 |
| 1998-2017 Avg | | 0.9% | 6,587 | | 0.9% | 6,587 | | 0.9% | 6,587 |



MT population projections



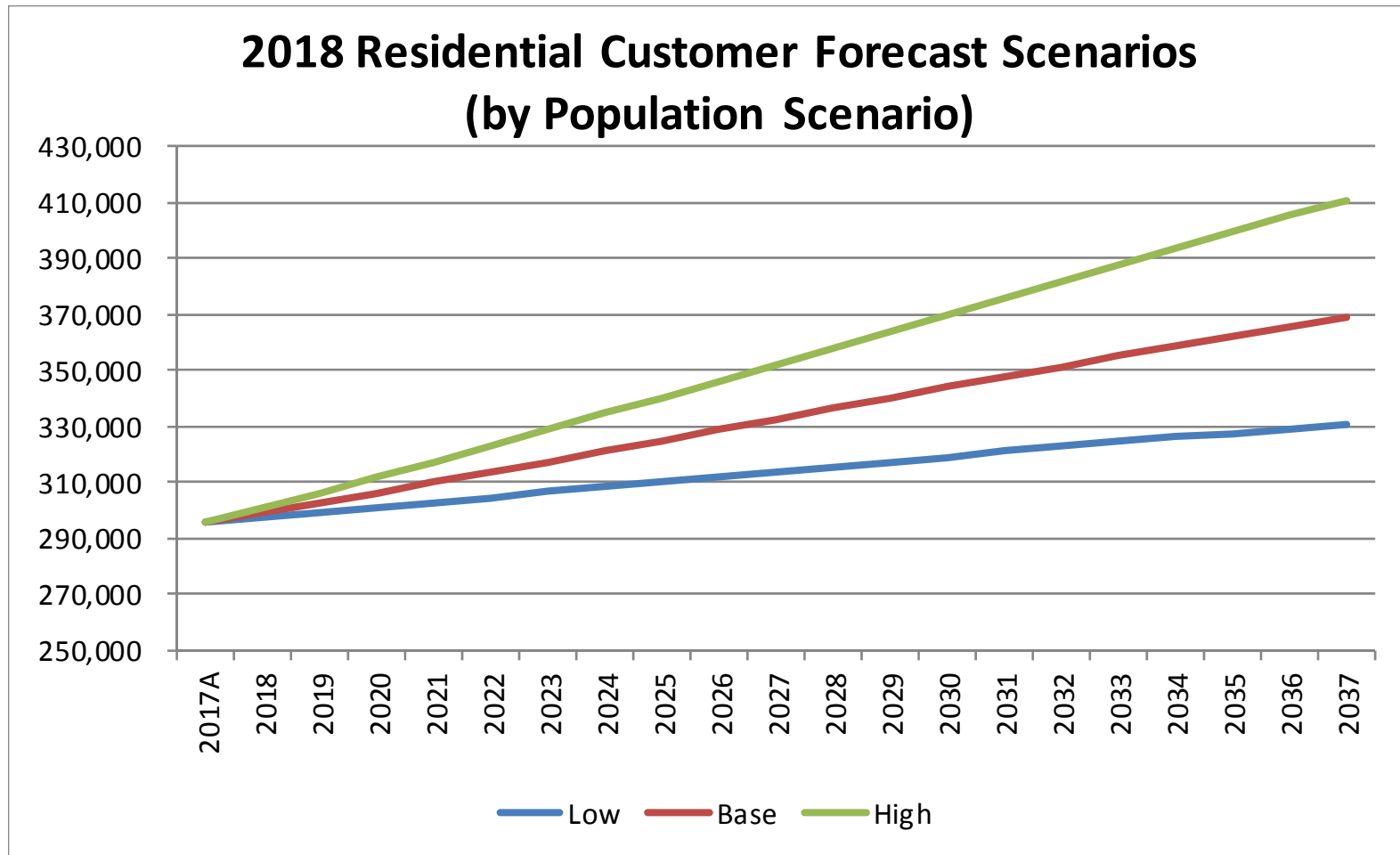


Residential customer forecast scenarios

| 2018 Residential Customer Forecast Summary | | | |
|--|---------------------|---------|---------|
| | Population Scenario | | |
| | Low | Base | High |
| 2017A | 295,427 | 295,427 | 295,427 |
| 2018 | 297,297 | 299,075 | 300,853 |
| 2019 | 299,086 | 302,669 | 306,268 |
| 2020 | 300,879 | 306,290 | 311,750 |
| 2021 | 302,683 | 309,947 | 317,312 |
| 2022 | 304,493 | 313,635 | 322,948 |
| 2023 | 306,309 | 317,352 | 328,652 |
| 2024 | 308,131 | 321,097 | 334,428 |
| 2025 | 309,953 | 324,862 | 340,259 |
| 2026 | 311,773 | 328,639 | 346,138 |
| 2027 | 313,590 | 332,427 | 352,059 |
| 2028 | 315,401 | 336,221 | 358,016 |
| 2029 | 317,208 | 340,020 | 364,009 |
| 2030 | 319,009 | 343,826 | 370,039 |
| 2031 | 320,777 | 347,578 | 376,011 |
| 2032 | 322,511 | 351,275 | 381,919 |
| 2033 | 324,216 | 354,925 | 387,778 |
| 2034 | 325,893 | 358,530 | 393,589 |
| 2035 | 327,541 | 362,089 | 399,347 |
| 2036 | 329,164 | 365,604 | 405,059 |
| 2037 | 330,762 | 369,081 | 410,730 |
| 2038 | 332,338 | 372,522 | 416,363 |
| 2019-2038 % | 0.6% | 1.1% | 1.6% |



Residential customer forecast scenarios





Residential customer-additions forecast

| 2018 Residential Customer Additions Forecast | | | |
|--|---------------------|-------|-------|
| | Population Scenario | | |
| | Low | Base | High |
| 2017A | 4,078 | 4,078 | 4,078 |
| 2018 | 1,870 | 3,648 | 5,426 |
| 2019 | 1,788 | 3,593 | 5,415 |
| 2020 | 1,794 | 3,621 | 5,482 |
| 2021 | 1,803 | 3,657 | 5,562 |
| 2022 | 1,811 | 3,689 | 5,636 |
| 2023 | 1,816 | 3,717 | 5,705 |
| 2024 | 1,821 | 3,745 | 5,775 |
| 2025 | 1,822 | 3,764 | 5,831 |
| 2026 | 1,820 | 3,777 | 5,878 |
| 2027 | 1,817 | 3,788 | 5,921 |
| 2028 | 1,812 | 3,794 | 5,957 |
| 2029 | 1,806 | 3,799 | 5,993 |
| 2030 | 1,801 | 3,806 | 6,030 |
| 2031 | 1,768 | 3,752 | 5,972 |
| 2032 | 1,734 | 3,697 | 5,908 |
| 2033 | 1,705 | 3,650 | 5,859 |
| 2034 | 1,677 | 3,605 | 5,811 |
| 2035 | 1,648 | 3,558 | 5,758 |
| 2036 | 1,622 | 3,516 | 5,712 |
| 2037 | 1,598 | 3,477 | 5,671 |
| 2038 | 1,575 | 3,440 | 5,633 |
| 2019-2038 Avg | 1,752 | 3,672 | 5,775 |
| 1998-2017 Avg | 3,379 | 3,379 | 3,379 |

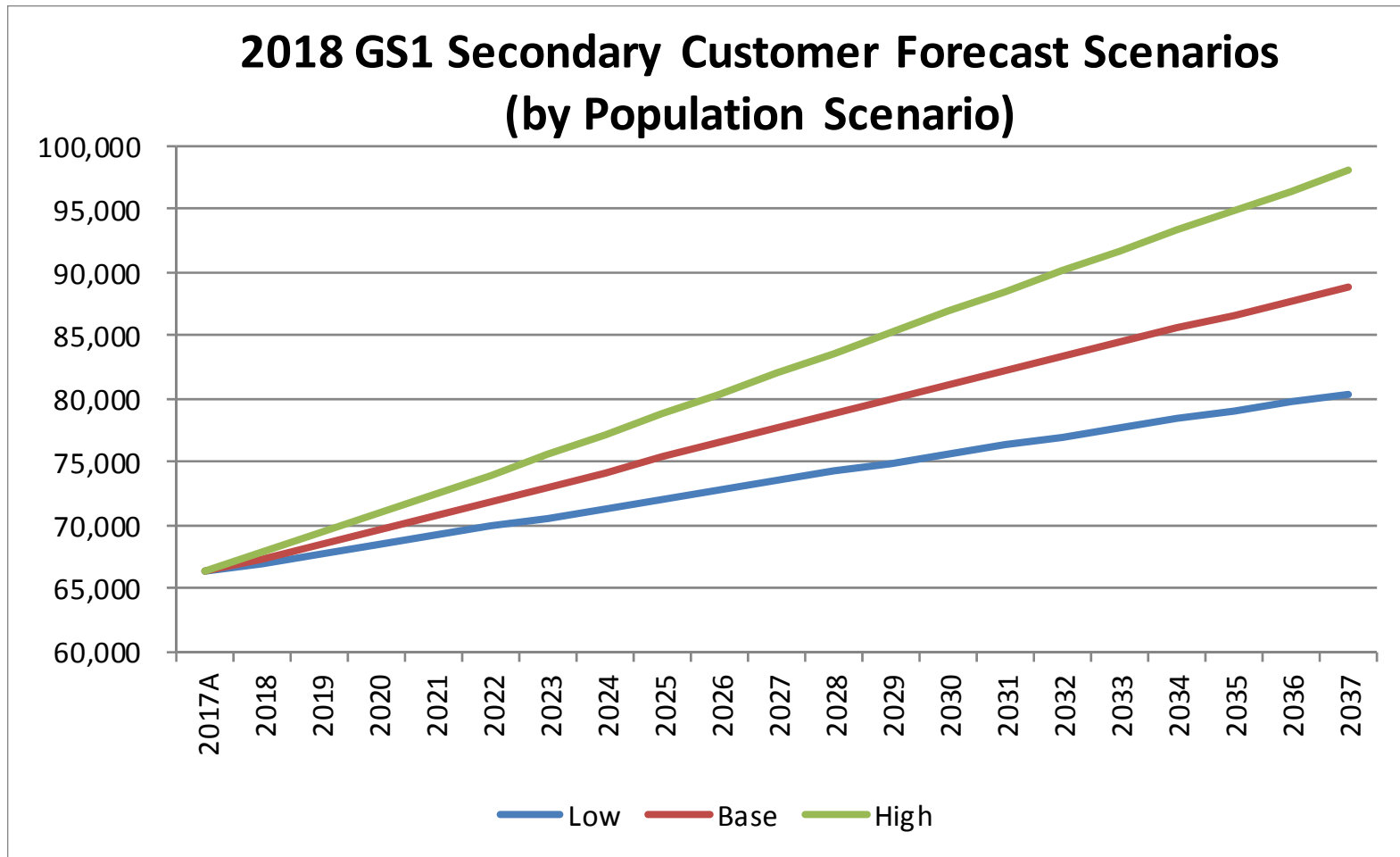


GS1 Secondary customer forecast scenarios

| 2018 GS1 Secondary Customer Forecast Summary | | | |
|--|---------------------|--------|--------|
| | Population Scenario | | |
| | Low | Base | High |
| 2017A | 66,323 | 66,323 | 66,323 |
| 2018 | 67,016 | 67,409 | 67,802 |
| 2019 | 67,730 | 68,523 | 69,318 |
| 2020 | 68,447 | 69,643 | 70,850 |
| 2021 | 69,165 | 70,771 | 72,400 |
| 2022 | 69,887 | 71,909 | 73,967 |
| 2023 | 70,612 | 73,053 | 75,552 |
| 2024 | 71,335 | 74,202 | 77,149 |
| 2025 | 72,058 | 75,354 | 78,758 |
| 2026 | 72,780 | 76,508 | 80,377 |
| 2027 | 73,498 | 77,662 | 82,002 |
| 2028 | 74,214 | 78,817 | 83,635 |
| 2029 | 74,925 | 79,969 | 85,272 |
| 2030 | 75,635 | 81,121 | 86,916 |
| 2031 | 76,333 | 82,258 | 88,544 |
| 2032 | 77,022 | 83,381 | 90,155 |
| 2033 | 77,702 | 84,491 | 91,754 |
| 2034 | 78,373 | 85,588 | 93,338 |
| 2035 | 79,036 | 86,673 | 94,910 |
| 2036 | 79,692 | 87,749 | 96,471 |
| 2037 | 80,343 | 88,814 | 98,022 |
| 2038 | 80,989 | 89,873 | 99,565 |
| 2019-2038 % | 0.9% | 1.4% | 1.9% |



GS1 Secondary customer forecast scenarios



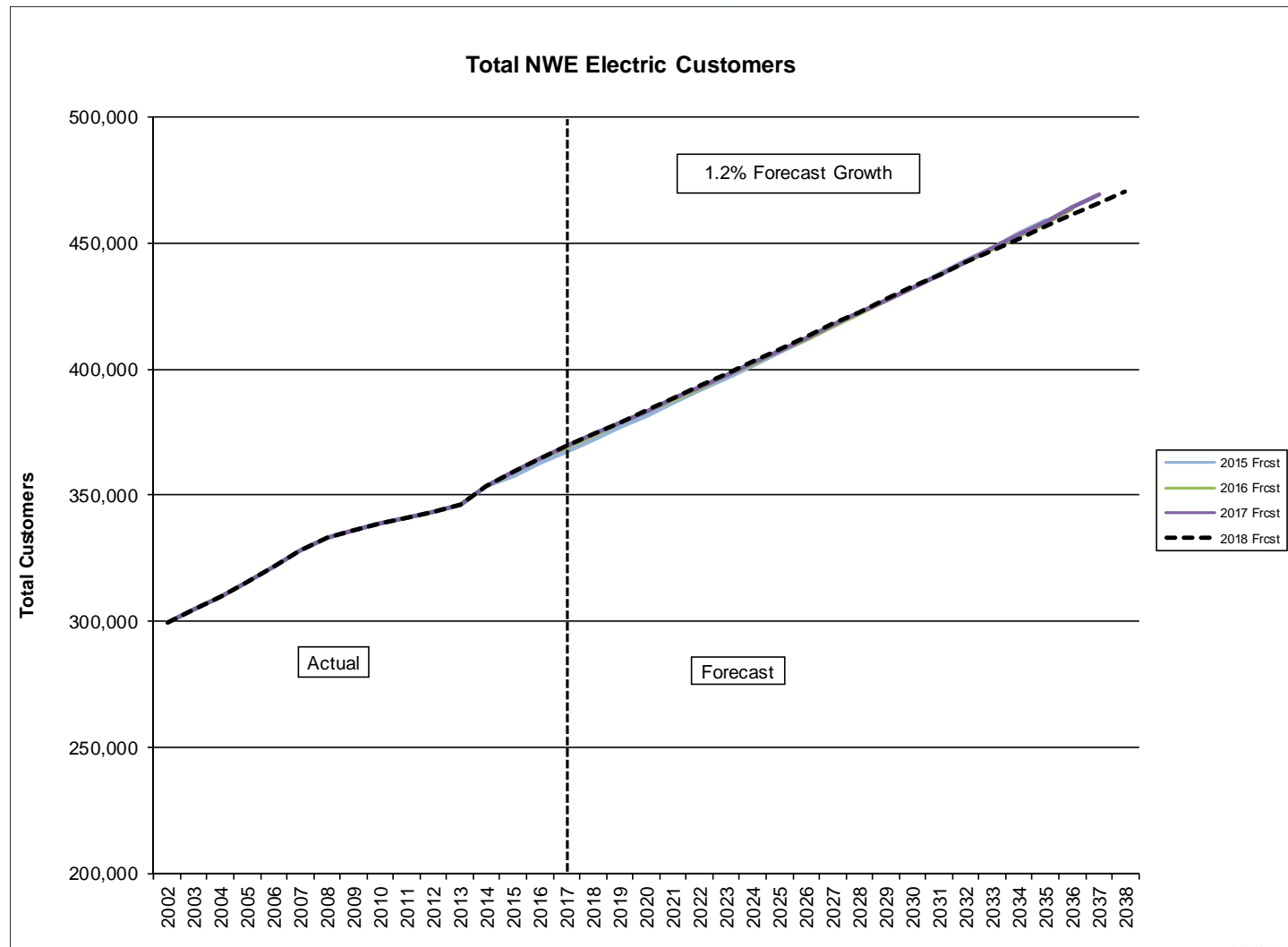


GS1 Secondary customer-additions forecast

| 2018 GS1 Secondary Customer Additions Forecast | | | |
|--|---------------------|-------|-------|
| | Population Scenario | | |
| | Low | Base | High |
| 2017A | 913 | 913 | 913 |
| 2018 | 693 | 1,086 | 1,479 |
| 2019 | 715 | 1,114 | 1,516 |
| 2020 | 717 | 1,121 | 1,532 |
| 2021 | 718 | 1,128 | 1,549 |
| 2022 | 722 | 1,137 | 1,568 |
| 2023 | 725 | 1,145 | 1,584 |
| 2024 | 723 | 1,148 | 1,597 |
| 2025 | 723 | 1,152 | 1,609 |
| 2026 | 722 | 1,154 | 1,619 |
| 2027 | 718 | 1,154 | 1,625 |
| 2028 | 716 | 1,155 | 1,633 |
| 2029 | 711 | 1,152 | 1,637 |
| 2030 | 709 | 1,152 | 1,644 |
| 2031 | 698 | 1,137 | 1,628 |
| 2032 | 689 | 1,123 | 1,612 |
| 2033 | 680 | 1,110 | 1,598 |
| 2034 | 671 | 1,097 | 1,585 |
| 2035 | 663 | 1,085 | 1,572 |
| 2036 | 657 | 1,075 | 1,561 |
| 2037 | 651 | 1,066 | 1,551 |
| 2038 | 646 | 1,059 | 1,543 |
| 2018-2037 Avg | 701 | 1,125 | 1,585 |
| 1998-2017 Avg | 951 | 951 | 951 |

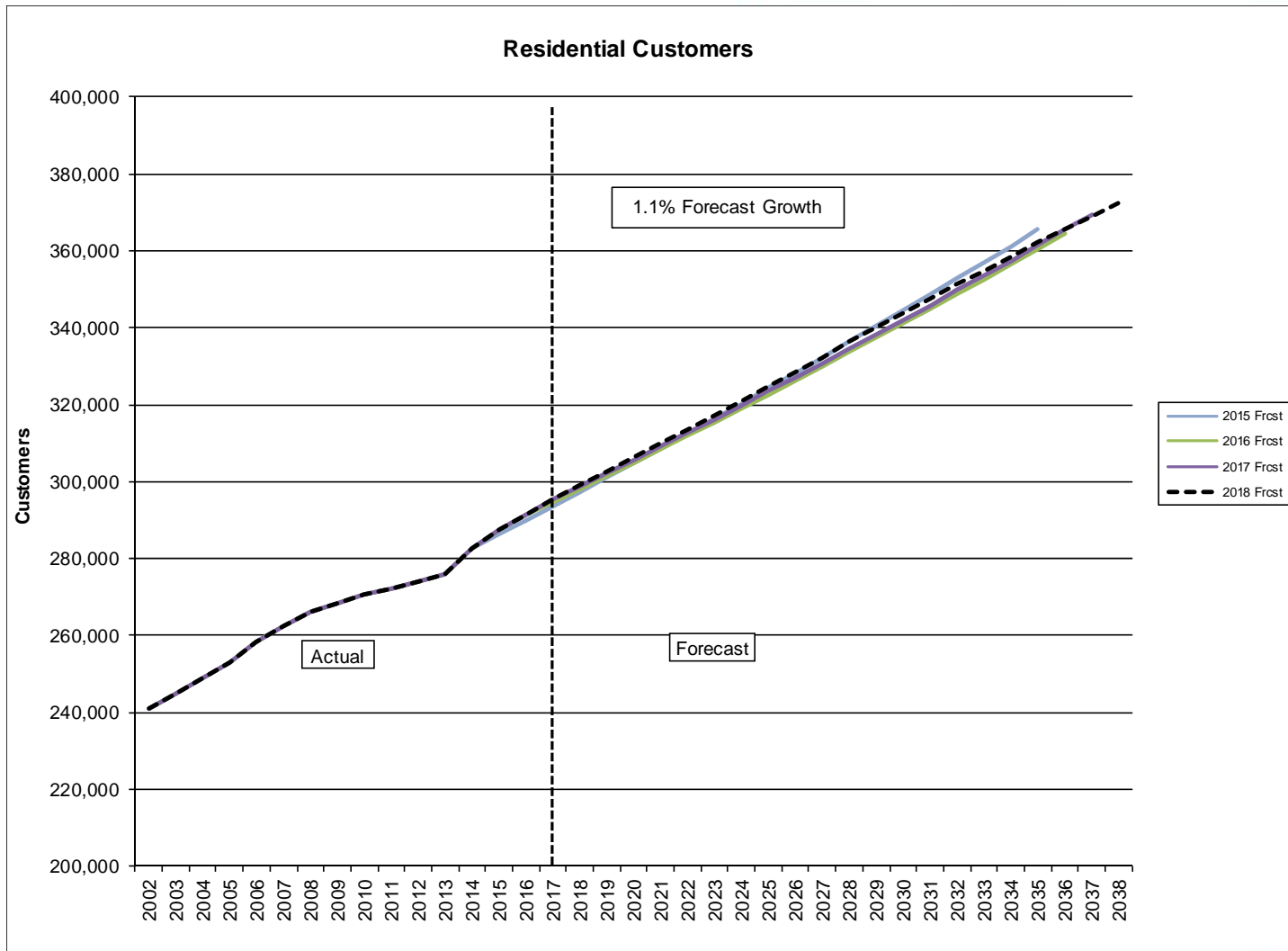


Total NWE customer forecast comparison



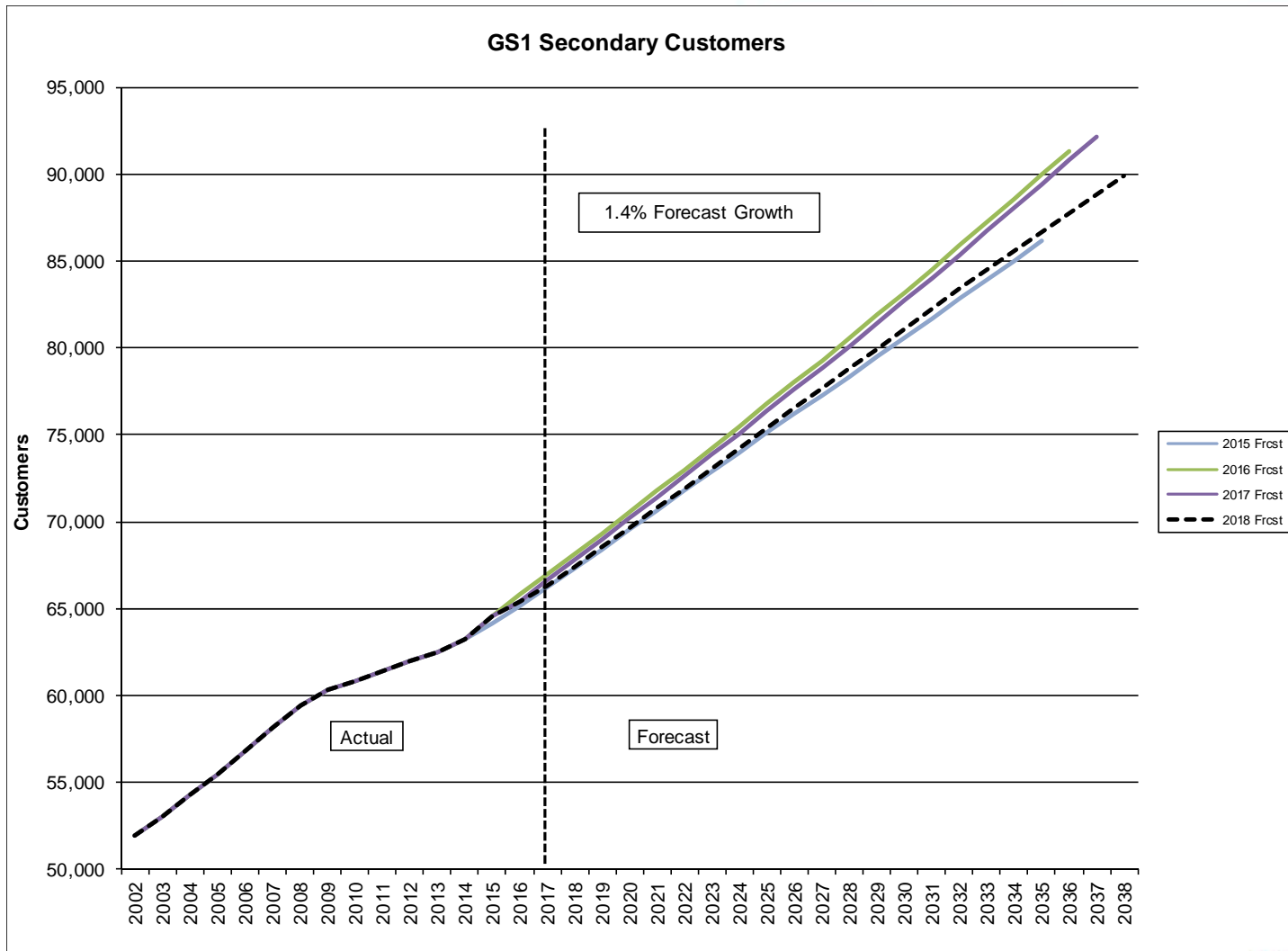


Residential customer forecast comparison





GS1 Sec customer forecast comparison





Population & customer counts summary

| Year | Montana Population | Annual Growth Rate | NWE Srcv Territory Population | Annual Growth Rate | NWE Total Accounts | Annual Growth Rate | NWE Residential Accounts | Annual Growth Rate | NWE GS1- Secondary Accounts | Annual Growth Rate |
|-------------|-------------------------------|-----------------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|---|-----------------------------------|--|-----------------------------------|
| 2000 | 903,773 | | 705,765 | | 292,437 | | 235,784 | | 49,759 | |
| 2005 | 940,102 | 0.8% | 734,415 | 0.8% | 315,755 | 1.5% | 253,124 | 1.4% | 55,491 | 2.2% |
| 2010 | 990,507 | 1.1% | 774,998 | 1.1% | 338,804 | 1.4% | 270,571 | 1.3% | 60,872 | 1.9% |
| 2015 | 1,028,317 | 0.8% | 805,975 | 0.8% | 359,565 | 1.2% | 287,387 | 1.2% | 64,554 | 1.2% |
| 2020 | 1,080,979 | 1.0% | 844,416 | 0.9% | 383,698 | 1.3% | 306,290 | 1.3% | 69,643 | 1.5% |
| 2025 | 1,132,055 | 0.9% | 884,368 | 0.9% | 407,986 | 1.2% | 324,862 | 1.2% | 75,354 | 1.6% |
| 2030 | 1,184,310 | 0.9% | 925,163 | 0.9% | 432,722 | 1.2% | 343,826 | 1.1% | 81,121 | 1.5% |
| 2035 | 1,234,745 | 0.8% | 964,449 | 0.8% | 456,542 | 1.1% | 362,089 | 1.0% | 86,673 | 1.3% |
| 2040 | 1,282,411 | 0.8% | 1,001,481 | 0.8% | 479,055 | 1.0% | 379,303 | 0.9% | 91,967 | 1.2% |



2. Normal weather forecast

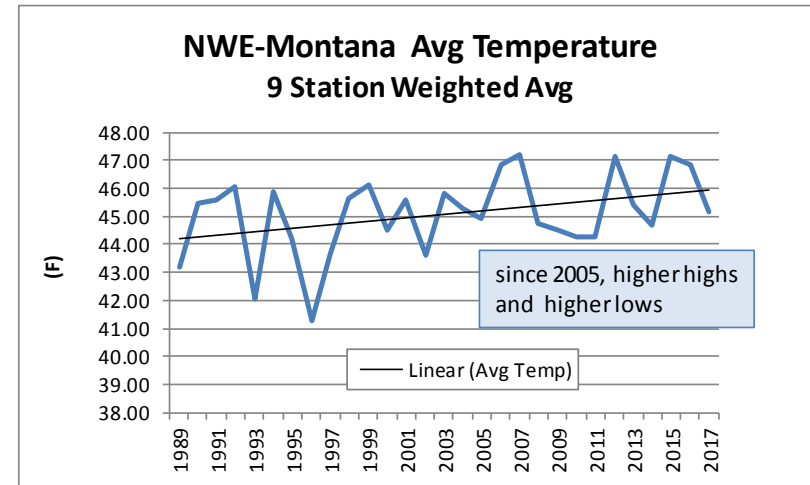
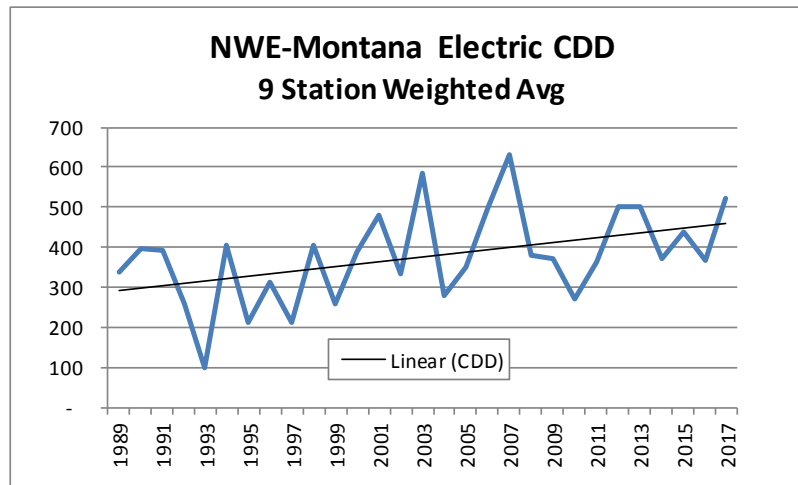
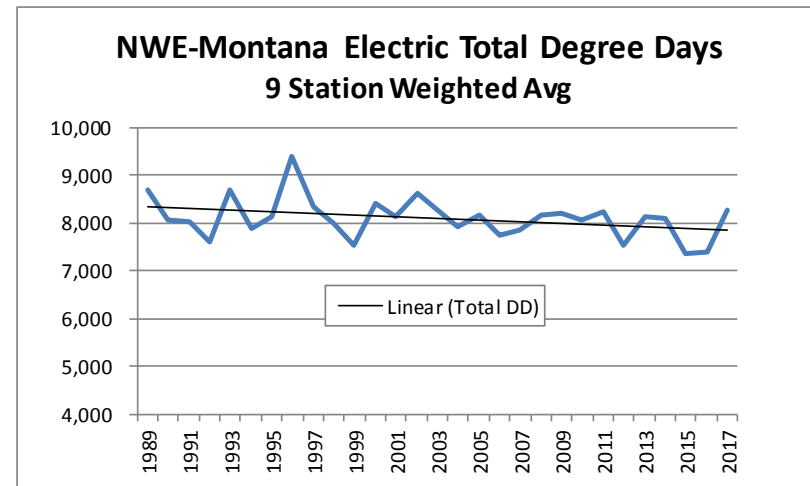
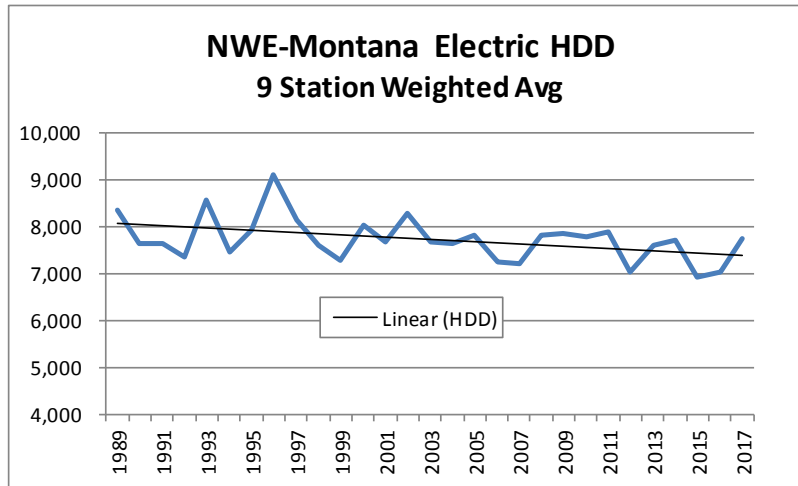


Total Degree Days (HDD + CDD)

- Heating degree day (HDD) = 65° - daily average temp
- Cooling degree day (CDD) = daily average temp - 65°
- Prior years' forecasts used historical total degree days (1989 – current year)
- Beginning with 2017 forecast, normal weather equals 10-year historical average total degree days

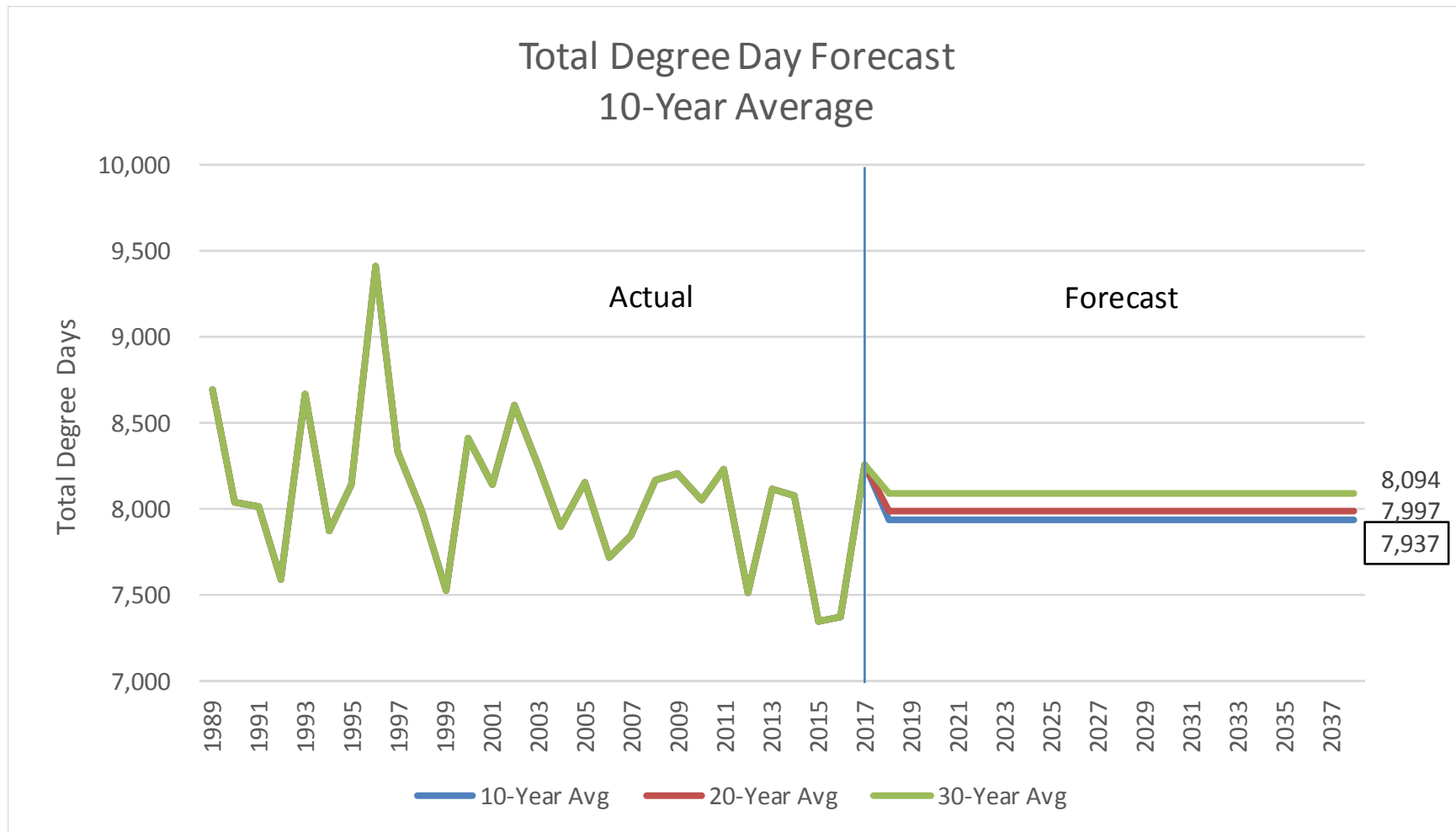


Climate metrics pointing warmer





Total degree day forecast





3. Demand Side Management (DSM) and Net Energy Metering (NEM)



- Energy and Peak forecasts incorporate new 20-year DSM plan of 4 aMW/year (78 aMW 2017-2036)
- The old DSM plan consisted of 6 aMW/year (84 aMW 2009-2024)



DSM plans summary

| 2009 DSM Plan 15 Years / 84 aMW | | | | 2017 DSM Plan 20 Years / 78 aMW | | | | Combined Plans 27 Years / 120 aMW | | | |
|------------------------------------|---------------|---------------|-------------------|------------------------------------|---------------|---------------|-------------------|--------------------------------------|---------------|---------------|-------------------|
| | Annual aMW | Annual MWh | Cumulative MWh | | Annual aMW | Annual MWh | Cumulative MWh | | Annual aMW | Annual MWh | Cumulative MWh |
| 2010 | 5.5 | 48,180 | 48,180 | 2017 | 4.35 | 38,106 | 38,106 | 2010 | 5.5 | 48,180 | 48,180 |
| 2011 | 6.0 | 52,560 | 100,740 | 2018 | 4.35 | 38,106 | 76,212 | 2011 | 6.0 | 52,560 | 100,740 |
| 2012 | 6.0 | 52,560 | 153,300 | 2019 | 4.35 | 38,106 | 114,318 | 2012 | 6.0 | 52,560 | 153,300 |
| 2013 | 6.0 | 52,560 | 205,860 | 2020 | 4.35 | 38,106 | 152,424 | 2013 | 6.0 | 52,560 | 205,860 |
| 2014 | 6.0 | 52,560 | 258,420 | 2021 | 4.35 | 38,106 | 190,530 | 2014 | 6.0 | 52,560 | 258,420 |
| 2015 | 6.0 | 52,560 | 310,980 | 2022 | 3.77 | 33,025 | 223,555 | 2015 | 6.0 | 52,560 | 310,980 |
| 2016 | 6.0 | 52,560 | 363,540 | 2023 | 3.77 | 33,025 | 256,580 | 2016 | 6.0 | 52,560 | 363,540 |
| 2017 | 6.0 | 52,560 | 416,100 | 2024 | 3.77 | 33,025 | 289,606 | 2017 | 4.35 | 38,106 | 401,646 |
| 2018 | 6.0 | 52,560 | 468,660 | 2025 | 3.77 | 33,025 | 322,631 | 2018 | 4.35 | 38,106 | 439,752 |
| 2019 | 6.0 | 52,560 | 521,220 | 2026 | 3.77 | 33,025 | 355,656 | 2019 | 4.35 | 38,106 | 477,858 |
| 2020 | 6.0 | 52,560 | 573,780 | 2027 | 3.77 | 33,025 | 388,681 | 2020 | 4.35 | 38,106 | 515,964 |
| 2021 | 6.0 | 52,560 | 626,340 | 2028 | 3.77 | 33,025 | 421,706 | 2021 | 4.35 | 38,106 | 554,070 |
| 2022 | 6.0 | 52,560 | 678,900 | 2029 | 3.77 | 33,025 | 454,732 | 2022 | 3.77 | 33,025 | 587,095 |
| 2023 | 6.0 | 52,560 | 731,460 | 2030 | 3.77 | 33,025 | 487,757 | 2023 | 3.77 | 33,025 | 620,120 |
| 2024 | 0.8 | 6,929 | 738,389 | 2031 | 3.77 | 33,025 | 520,782 | 2024 | 3.77 | 33,025 | 653,146 |
| Total | 84.3 | 738,389 | | 2032 | 3.77 | 33,025 | 553,807 | 2025 | 3.77 | 33,025 | 686,171 |
| | | | | 2033 | 3.77 | 33,025 | 586,832 | 2026 | 3.77 | 33,025 | 719,196 |
| | | | | 2034 | 3.77 | 33,025 | 619,858 | 2027 | 3.77 | 33,025 | 752,221 |
| | | | | 2035 | 3.77 | 33,025 | 652,883 | 2028 | 3.77 | 33,025 | 785,246 |
| | | | | 2036 | 3.77 | 33,025 | 685,908 | 2029 | 3.77 | 33,025 | 818,272 |
| | | | | Total | 78.3 | 685,908 | | 2030 | 3.77 | 33,025 | 851,297 |
| | | | | | | | | 2031 | 3.77 | 33,025 | 884,322 |
| | | | | | | | | 2032 | 3.77 | 33,025 | 917,347 |
| | | | | | | | | 2033 | 3.77 | 33,025 | 950,372 |
| | | | | | | | | 2034 | 3.77 | 33,025 | 983,398 |
| | | | | | | | | 2035 | 3.77 | 33,025 | 1,016,423 |
| | | | | | | | | 2036 | 3.77 | 33,025 | 1,049,448 |
| | | | | | | | | Total | 119.8 | 1,049,448 | |

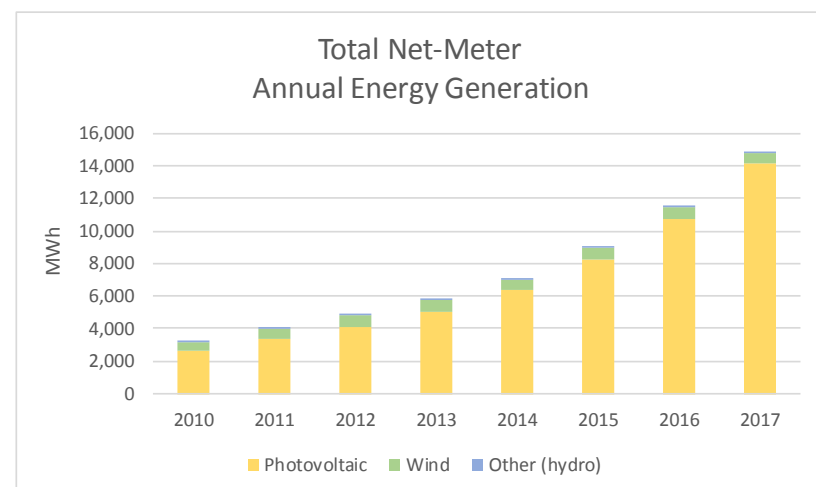
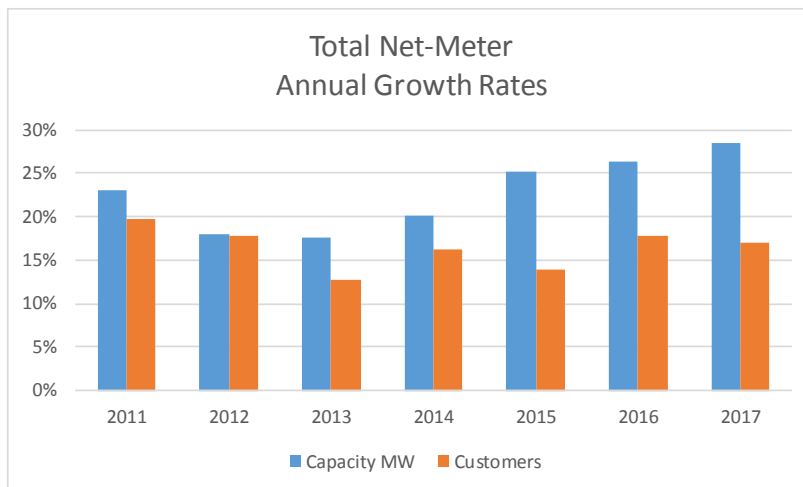
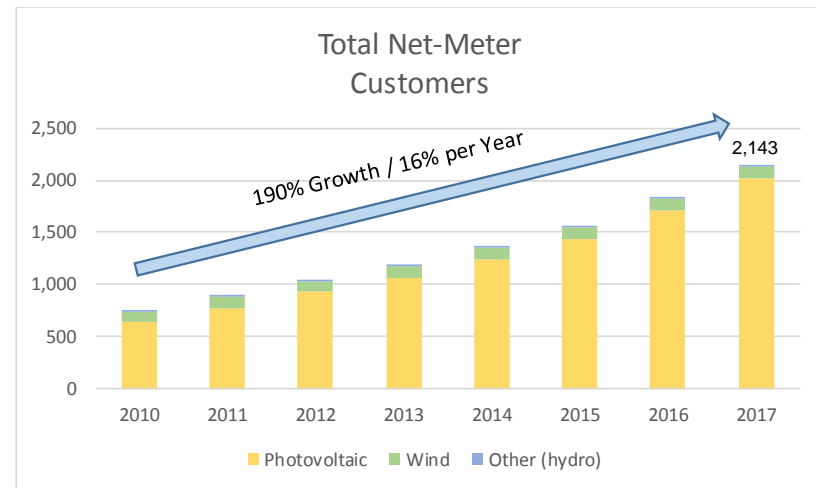
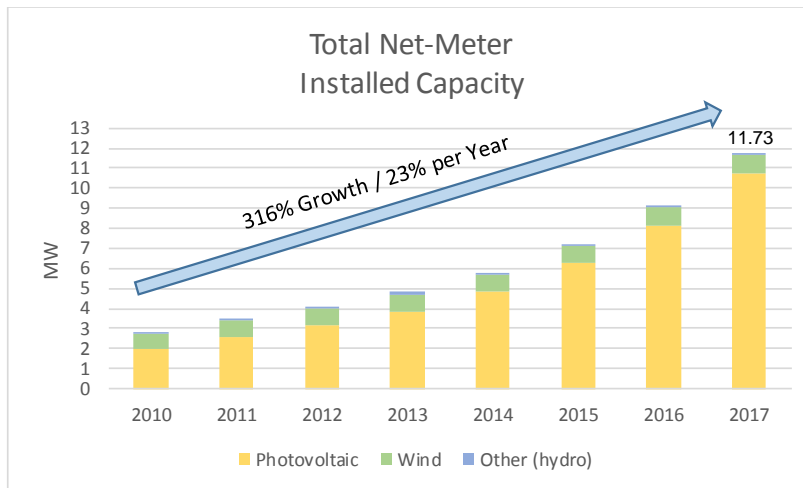


DSM peak shaving contribution

| New DSM Plan - Peak Shaving Forecast | | | |
|--------------------------------------|------------|--------------|--------|
| Including Losses | | | |
| | | Peak Shaving | |
| | Cumulative | Winter | Summer |
| | DSM | December | July |
| | aMW | MW | MW |
| 2017 | 4.72 | 7.43 | 6.89 |
| 2018 | 9.44 | 14.85 | 13.78 |
| 2019 | 14.16 | 22.28 | 20.67 |
| 2020 | 18.88 | 29.70 | 27.56 |
| 2021 | 23.60 | 37.13 | 34.45 |
| 2022 | 27.69 | 43.56 | 40.42 |
| 2023 | 31.78 | 50.00 | 46.39 |
| 2024 | 35.87 | 56.43 | 52.37 |
| 2025 | 39.96 | 62.87 | 58.34 |
| 2026 | 44.06 | 69.30 | 64.31 |
| 2027 | 48.15 | 75.74 | 70.28 |
| 2028 | 52.24 | 82.17 | 76.25 |
| 2029 | 56.33 | 88.61 | 82.22 |
| 2030 | 60.42 | 95.04 | 88.20 |
| 2031 | 64.51 | 101.48 | 94.17 |
| 2032 | 68.60 | 107.91 | 100.14 |
| 2033 | 72.69 | 114.35 | 106.11 |
| 2034 | 76.78 | 120.78 | 112.08 |
| 2035 | 80.87 | 127.22 | 118.05 |
| 2036 | 84.96 | 133.65 | 124.03 |

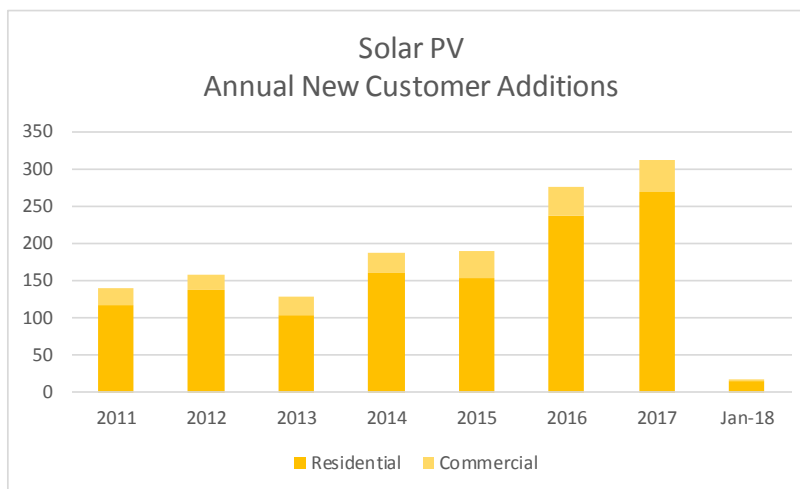
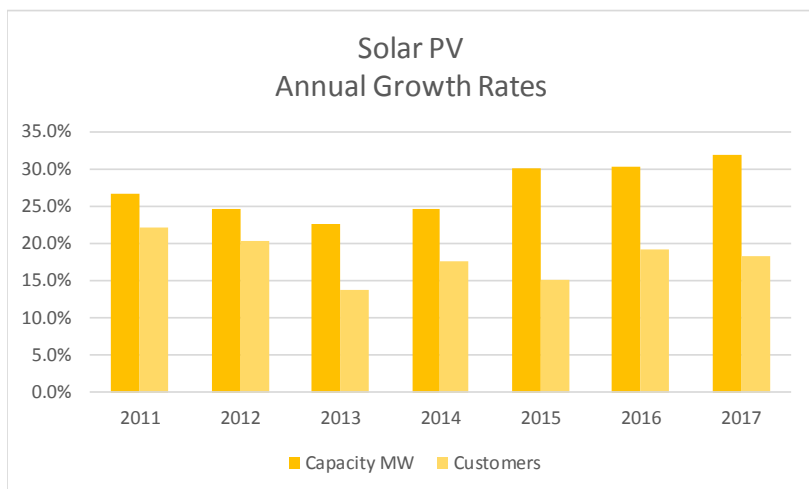
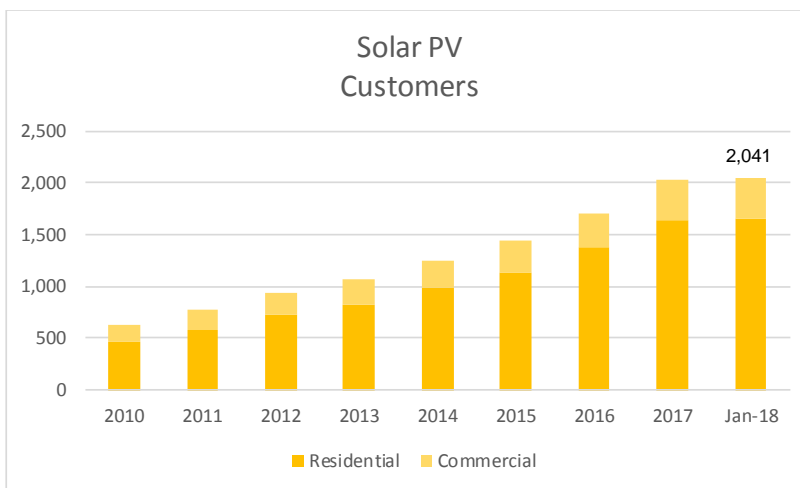
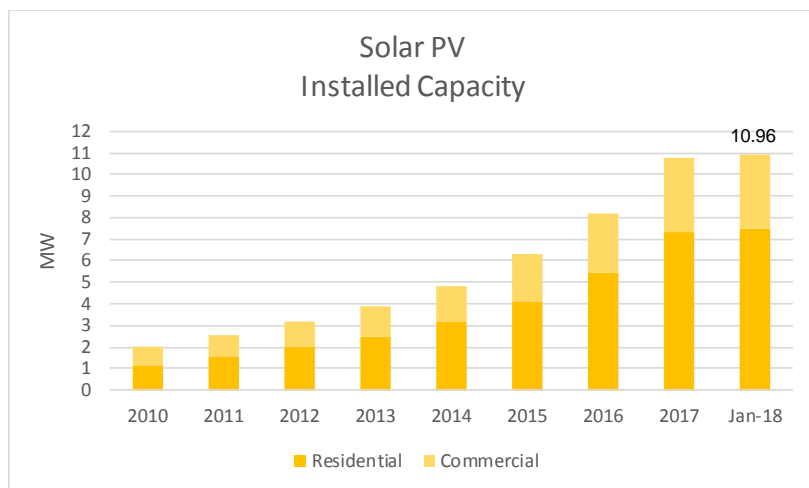


Total net metering



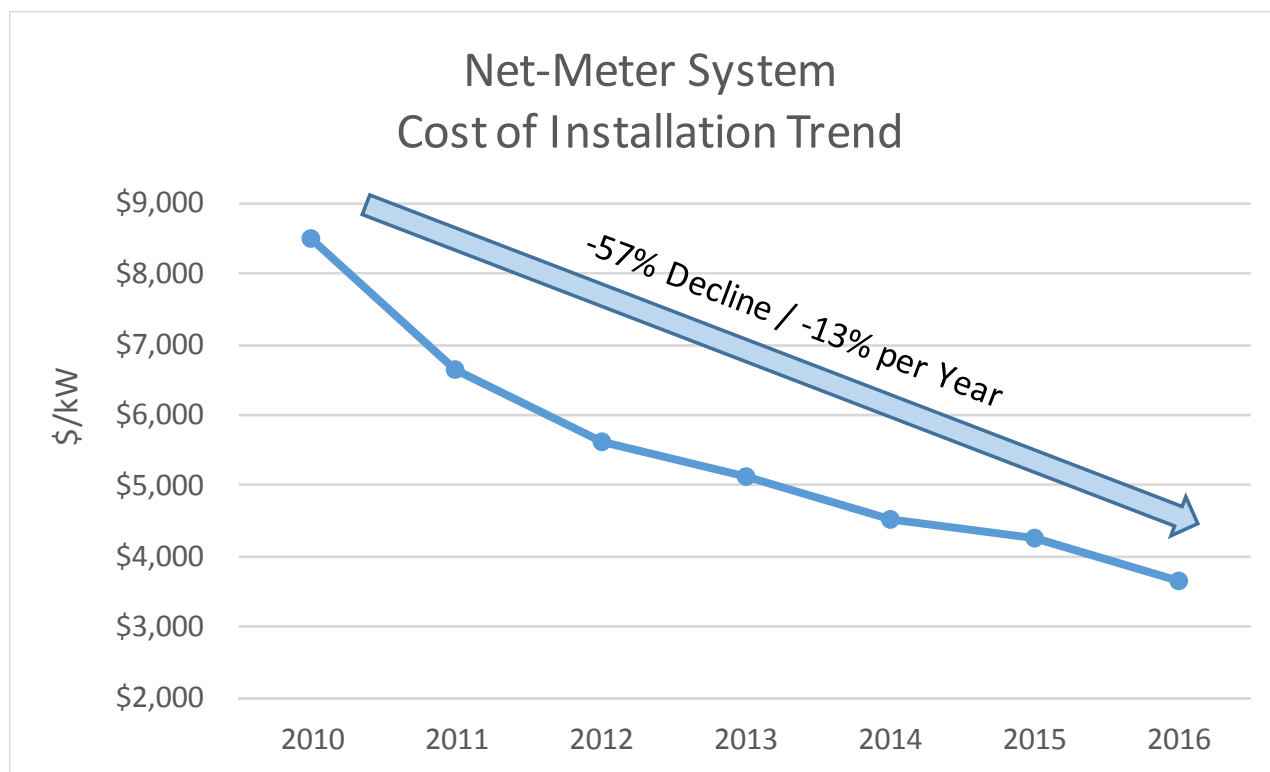


Solar-PV net metering





Net-Meter system cost trend





Net Meter – solar PV forecast scenarios

Solar PV Net Meter Forecast -> Based on Navigant NEM Study (Navigant's solar net-meter penetration forecast informed by NREL's penetration study in 2017)

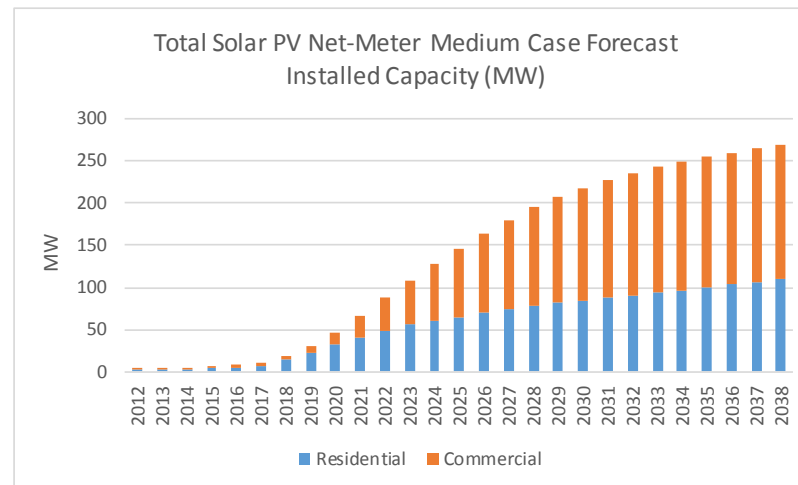
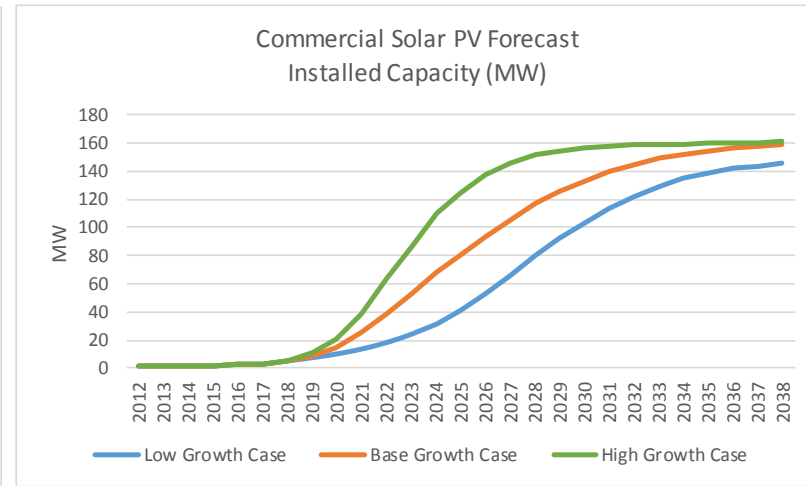
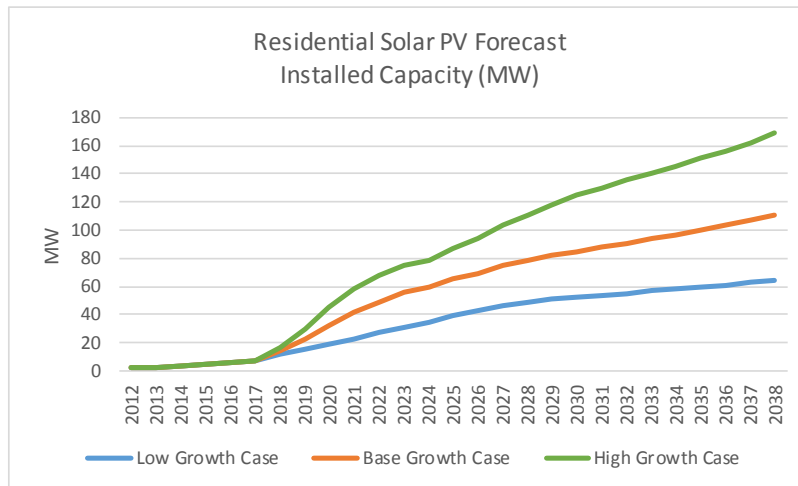
Installed Capacity (MW)

Growth Assumptions

| | Low Growth Case | | | | Base Growth Case | | | | High Growth Case | | | |
|------|-----------------|------------|-------|--------|------------------|------------|-------|--------|------------------|------------|-------|--------|
| | Residential | Commercial | Total | Growth | Residential | Commercial | Total | Growth | Residential | Commercial | Total | Growth |
| 2012 | 2 | 1 | 3 | | 2 | 1 | 3 | | 2 | 1 | 3 | |
| 2013 | 2 | 1 | 4 | 23% | 2 | 1 | 4 | 23% | 2 | 1 | 4 | 23% |
| 2014 | 3 | 2 | 5 | 25% | 3 | 2 | 5 | 25% | 3 | 2 | 5 | 25% |
| 2015 | 4 | 2 | 6 | 30% | 4 | 2 | 6 | 30% | 4 | 2 | 6 | 30% |
| 2016 | 5 | 3 | 8 | 30% | 5 | 3 | 8 | 30% | 5 | 3 | 8 | 30% |
| 2017 | 7 | 3 | 11 | 32% | 7 | 3 | 11 | 32% | 7 | 3 | 11 | 32% |
| 2018 | 11 | 5 | 16 | 52% | 14 | 5 | 19 | 76% | 17 | 5 | 22 | 100% |
| 2019 | 15 | 7 | 22 | 35% | 22 | 9 | 31 | 65% | 29 | 11 | 40 | 88% |
| 2020 | 19 | 10 | 29 | 31% | 32 | 15 | 47 | 51% | 45 | 20 | 65 | 62% |
| 2021 | 23 | 13 | 37 | 26% | 41 | 26 | 67 | 42% | 58 | 39 | 97 | 49% |
| 2022 | 27 | 18 | 45 | 24% | 49 | 39 | 88 | 32% | 67 | 63 | 131 | 35% |
| 2023 | 31 | 24 | 55 | 22% | 56 | 53 | 108 | 23% | 75 | 86 | 161 | 23% |
| 2024 | 35 | 32 | 67 | 21% | 60 | 68 | 128 | 18% | 79 | 110 | 189 | 17% |
| 2025 | 39 | 41 | 80 | 21% | 65 | 81 | 146 | 14% | 87 | 125 | 212 | 12% |
| 2026 | 42 | 53 | 95 | 19% | 69 | 94 | 163 | 12% | 94 | 137 | 231 | 9% |
| 2027 | 46 | 66 | 112 | 18% | 74 | 106 | 180 | 10% | 103 | 145 | 248 | 7% |
| 2028 | 49 | 80 | 129 | 15% | 78 | 117 | 196 | 8% | 111 | 151 | 262 | 6% |
| 2029 | 51 | 92 | 142 | 11% | 82 | 126 | 208 | 6% | 118 | 155 | 273 | 4% |
| 2030 | 52 | 103 | 155 | 9% | 85 | 133 | 218 | 5% | 125 | 156 | 281 | 3% |
| 2031 | 54 | 113 | 167 | 8% | 88 | 139 | 227 | 4% | 130 | 158 | 288 | 2% |
| 2032 | 55 | 122 | 177 | 6% | 91 | 145 | 236 | 4% | 135 | 158 | 294 | 2% |
| 2033 | 57 | 129 | 186 | 5% | 94 | 149 | 243 | 3% | 140 | 159 | 299 | 2% |
| 2034 | 58 | 135 | 193 | 4% | 97 | 152 | 249 | 3% | 145 | 159 | 305 | 2% |
| 2035 | 60 | 139 | 199 | 3% | 100 | 154 | 254 | 2% | 151 | 160 | 310 | 2% |
| 2036 | 61 | 142 | 203 | 2% | 103 | 156 | 259 | 2% | 156 | 160 | 316 | 2% |
| 2037 | 63 | 144 | 206 | 2% | 107 | 158 | 265 | 2% | 162 | 160 | 323 | 2% |
| 2038 | 64 | 145 | 209 | 1% | 110 | 159 | 270 | 2% | 169 | 161 | 330 | 2% |



Net Meter – solar PV forecast scenarios





Net Meter – solar PV contribution to summer peak

| Solar PV Net Meter Forecast | | | | |
|--|-----------------------------|------|------|---|
| Contribution to NWE Peak Load (MW) - Excludes Losses | | | | |
| Peak Capacity Factor for MT (SPP Model) | | | 52% | |
| | Contribution to Summer Peak | | | M |
| | Low | Base | High | |
| 2012 | 2 | 2 | 2 | |
| 2013 | 2 | 2 | 2 | |
| 2014 | 3 | 3 | 3 | |
| 2015 | 3 | 3 | 3 | |
| 2016 | 4 | 4 | 4 | |
| 2017 | 6 | 6 | 6 | |
| 2018 | 9 | 10 | 11 | |
| 2019 | 12 | 16 | 21 | |
| 2020 | 15 | 24 | 34 | |
| 2021 | 19 | 35 | 50 | |
| 2022 | 24 | 46 | 68 | |
| 2023 | 29 | 56 | 84 | |
| 2024 | 35 | 66 | 98 | |
| 2025 | 42 | 76 | 110 | |
| 2026 | 50 | 85 | 120 | |
| 2027 | 58 | 94 | 129 | |
| 2028 | 67 | 102 | 136 | |
| 2029 | 74 | 108 | 142 | |
| 2030 | 81 | 113 | 146 | |
| 2031 | 87 | 118 | 150 | |
| 2032 | 92 | 122 | 153 | |
| 2033 | 97 | 126 | 156 | |
| 2034 | 101 | 129 | 158 | |
| 2035 | 103 | 132 | 161 | |
| 2036 | 105 | 135 | 164 | |
| 2037 | 107 | 138 | 168 | |
| 2038 | 109 | 140 | 172 | |



Net Meter – solar PV contribution to annual energy

Solar PV Net Meter Forecast -> Based on Navigant NEM Study (Navigant's solar net-meter penetration forecast informed by NREL's penetration study in 2017)

Energy Production (MWh) - Excludes Losses

| Capacity Factor | | | | | | | | | | | | | |
|-----------------|-----------------|------------|---------|--------|------------------|------------|---------|--------|------------------|------------|---------|--------|--|
| 15% | | | | | | | | | | | | | |
| | Low Growth Case | | | | Base Growth Case | | | | High Growth Case | | | | |
| | Residential | Commercial | Total | Growth | Residential | Commercial | Total | Growth | Residential | Commercial | Total | Growth | |
| 2012 | 2,611 | 1,539 | 4,150 | | 2,611 | 1,539 | 4,150 | | 2,611 | 1,539 | 4,150 | | |
| 2013 | 3,198 | 1,887 | 5,085 | 23% | 3,198 | 1,887 | 5,085 | 23% | 3,198 | 1,887 | 5,085 | 23% | |
| 2014 | 4,293 | 2,237 | 6,530 | 28% | 4,293 | 2,237 | 6,530 | 28% | 4,293 | 2,237 | 6,530 | 28% | |
| 2015 | 5,625 | 2,868 | 8,761 | 34% | 5,625 | 2,868 | 8,761 | 34% | 5,625 | 2,868 | 8,761 | 34% | |
| 2016 | 7,408 | 3,650 | 10,982 | 25% | 7,408 | 3,650 | 10,982 | 25% | 7,408 | 3,650 | 10,982 | 25% | |
| 2017 | 9,908 | 4,668 | 15,795 | 44% | 9,908 | 4,668 | 15,795 | 44% | 9,908 | 4,668 | 15,795 | 44% | |
| 2018 | 15,169 | 7,007 | 22,175 | 40% | 18,675 | 6,981 | 25,656 | 62% | 22,487 | 6,649 | 29,136 | 84% | |
| 2019 | 20,178 | 9,810 | 29,988 | 35% | 29,687 | 12,652 | 42,339 | 65% | 39,896 | 14,795 | 54,691 | 88% | |
| 2020 | 25,918 | 13,250 | 39,169 | 31% | 43,018 | 20,764 | 63,782 | 51% | 60,744 | 27,651 | 88,395 | 62% | |
| 2021 | 31,284 | 18,217 | 49,501 | 26% | 55,800 | 34,716 | 90,516 | 42% | 79,041 | 52,489 | 131,531 | 49% | |
| 2022 | 36,926 | 24,385 | 61,310 | 24% | 66,573 | 52,631 | 119,204 | 32% | 91,149 | 85,949 | 177,098 | 35% | |
| 2023 | 41,946 | 32,714 | 74,661 | 22% | 75,297 | 71,281 | 146,577 | 23% | 101,725 | 116,769 | 218,494 | 23% | |
| 2024 | 46,987 | 43,135 | 90,122 | 21% | 81,145 | 91,902 | 173,047 | 18% | 106,603 | 149,369 | 255,972 | 17% | |
| 2025 | 52,382 | 56,223 | 108,605 | 21% | 88,379 | 109,403 | 197,782 | 14% | 118,050 | 168,910 | 286,960 | 12% | |
| 2026 | 57,241 | 71,895 | 129,136 | 19% | 93,983 | 127,268 | 221,251 | 12% | 127,321 | 186,046 | 313,367 | 9% | |
| 2027 | 62,451 | 89,519 | 151,970 | 18% | 100,832 | 143,397 | 244,229 | 10% | 139,566 | 196,921 | 336,487 | 7% | |
| 2028 | 66,011 | 108,335 | 174,346 | 15% | 106,230 | 158,726 | 264,956 | 8% | 150,493 | 205,074 | 355,567 | 6% | |
| 2029 | 68,797 | 124,174 | 192,971 | 11% | 111,087 | 170,225 | 281,312 | 6% | 160,157 | 209,496 | 369,653 | 4% | |
| 2030 | 70,147 | 139,621 | 209,768 | 9% | 114,788 | 180,418 | 295,206 | 5% | 168,731 | 211,914 | 380,645 | 3% | |
| 2031 | 72,798 | 153,117 | 225,915 | 8% | 119,214 | 188,738 | 307,952 | 4% | 176,276 | 213,714 | 389,990 | 2% | |
| 2032 | 74,518 | 165,811 | 240,329 | 6% | 123,015 | 196,177 | 319,192 | 4% | 183,394 | 214,661 | 398,055 | 2% | |
| 2033 | 77,034 | 175,207 | 252,241 | 5% | 127,324 | 201,594 | 328,918 | 3% | 190,144 | 215,452 | 405,596 | 2% | |
| 2034 | 78,765 | 183,148 | 261,914 | 4% | 131,182 | 206,217 | 337,399 | 3% | 196,896 | 215,988 | 412,884 | 2% | |
| 2035 | 80,893 | 188,131 | 269,024 | 3% | 135,445 | 209,226 | 344,671 | 2% | 203,958 | 216,360 | 420,318 | 2% | |
| 2036 | 82,548 | 192,015 | 274,563 | 2% | 139,559 | 211,857 | 351,417 | 2% | 211,401 | 216,869 | 428,270 | 2% | |
| 2037 | 84,805 | 194,679 | 279,484 | 2% | 144,471 | 213,935 | 358,406 | 2% | 219,868 | 217,460 | 437,328 | 2% | |
| 2038 | 86,829 | 196,724 | 283,553 | 1% | 149,466 | 215,927 | 365,393 | 2% | 228,935 | 218,298 | 447,233 | 2% | |



4. Peak demand forecast



Peak demand forecast methodology

Peak Demand Forecast Methodology

- Regression
 - For the summer peak forecast, peak-day max temperature, monthly energy, and customers used as explanatory variables
 - » 10-year average peak-day max temperatures assumed in forecast
 - For the winter peak forecast, peak-day heating degree days, monthly energy, and customers used as explanatory variables
 - » 10-year average peak-day heating degree days assumed in forecast

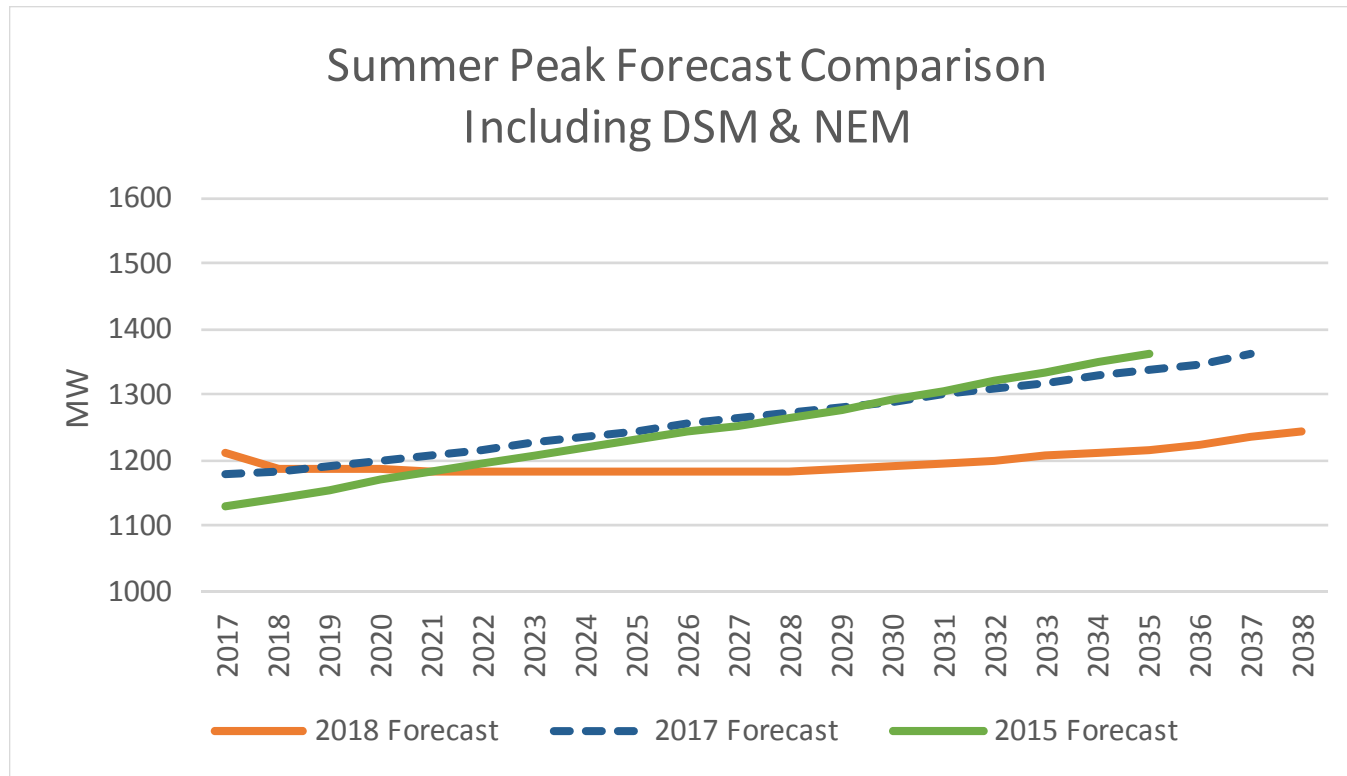


Summer peak forecast results

| Historic and Forecast Values Include Losses | | | | |
|--|------------|------------------|--------------------|----------|
| Summer | 2018 | Less | Less | 2018 |
| | Regression | DSM ² | NEM ^{1,2} | Forecast |
| 2012 | 1133 | | | 1133 |
| 2013 | 1162 | | | 1162 |
| 2014 | 1115 | | | 1115 |
| 2015 | 1146 | | | 1146 |
| 2016 | 1147 | | | 1147 |
| 2017 | 1210 | | | 1210 |
| 2018 | 1197 | 7 | 4 | 1186 |
| 2019 | 1212 | 14 | 11 | 1187 |
| 2020 | 1226 | 21 | 19 | 1187 |
| 2021 | 1241 | 28 | 29 | 1184 |
| 2022 | 1255 | 34 | 40 | 1181 |
| 2023 | 1272 | 40 | 51 | 1182 |
| 2024 | 1287 | 45 | 61 | 1181 |
| 2025 | 1303 | 51 | 70 | 1181 |
| 2026 | 1318 | 57 | 79 | 1182 |
| 2027 | 1334 | 63 | 88 | 1182 |
| 2028 | 1349 | 69 | 96 | 1184 |
| 2029 | 1365 | 75 | 102 | 1187 |
| 2030 | 1380 | 81 | 108 | 1191 |
| 2031 | 1396 | 87 | 113 | 1196 |
| 2032 | 1411 | 93 | 117 | 1201 |
| 2033 | 1426 | 99 | 121 | 1206 |
| 2034 | 1440 | 105 | 124 | 1211 |
| 2035 | 1455 | 111 | 127 | 1217 |
| 2036 | 1469 | 117 | 129 | 1223 |
| 2037 | 1483 | 117 | 132 | 1234 |
| 2038 | 1498 | 117 | 135 | 1246 |
| Avg Growth Rate | 1.1% | | | 0.2% |
| Avg Increase (MW) | 15 | | | 3 |
| 1 Navigant medium case solar pv - net meter forecast | | | | |
| 2 Incremental DSM and NEM | | | | |

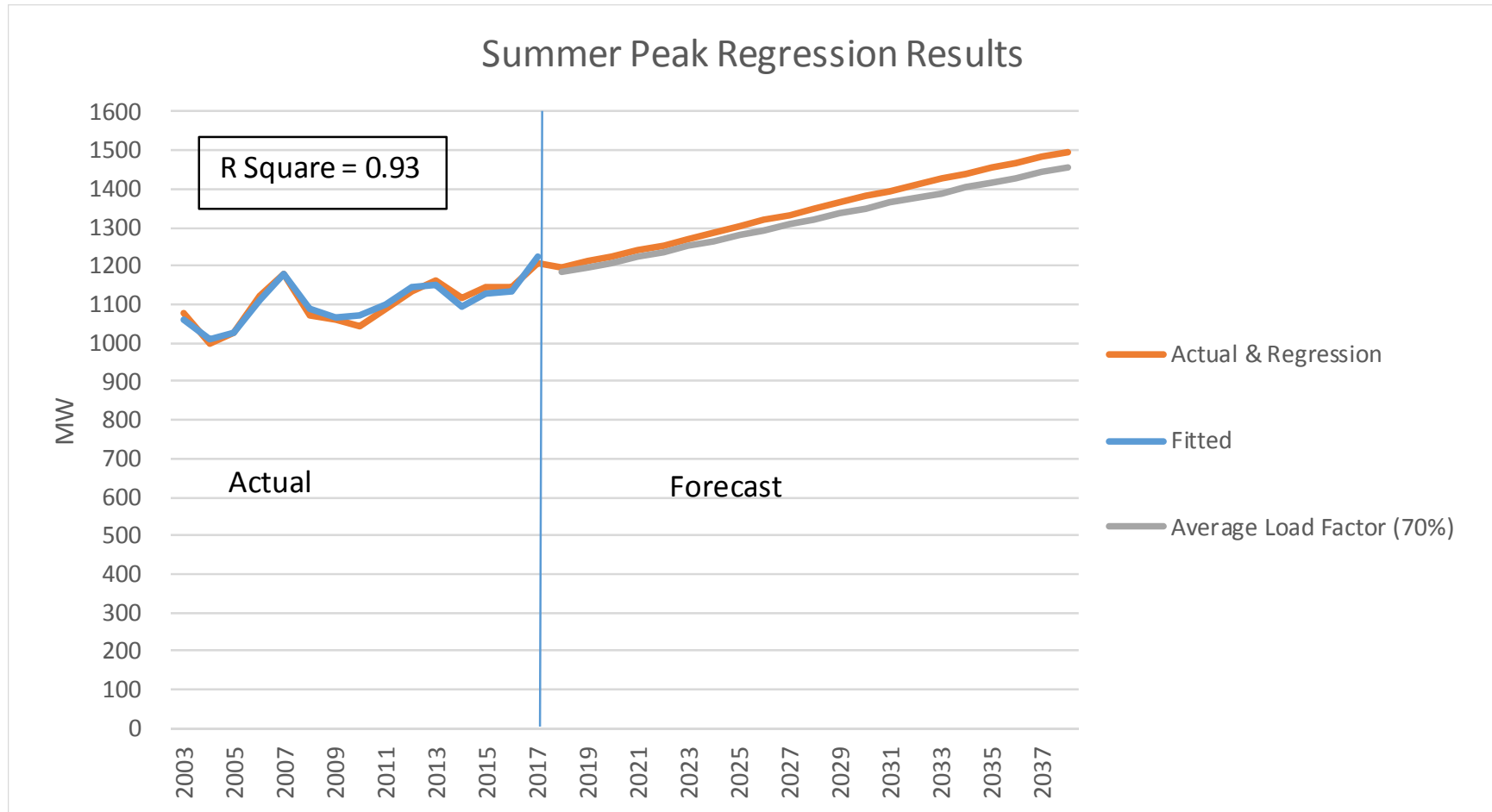


Summer peak forecast results





Summer peak forecast regression results



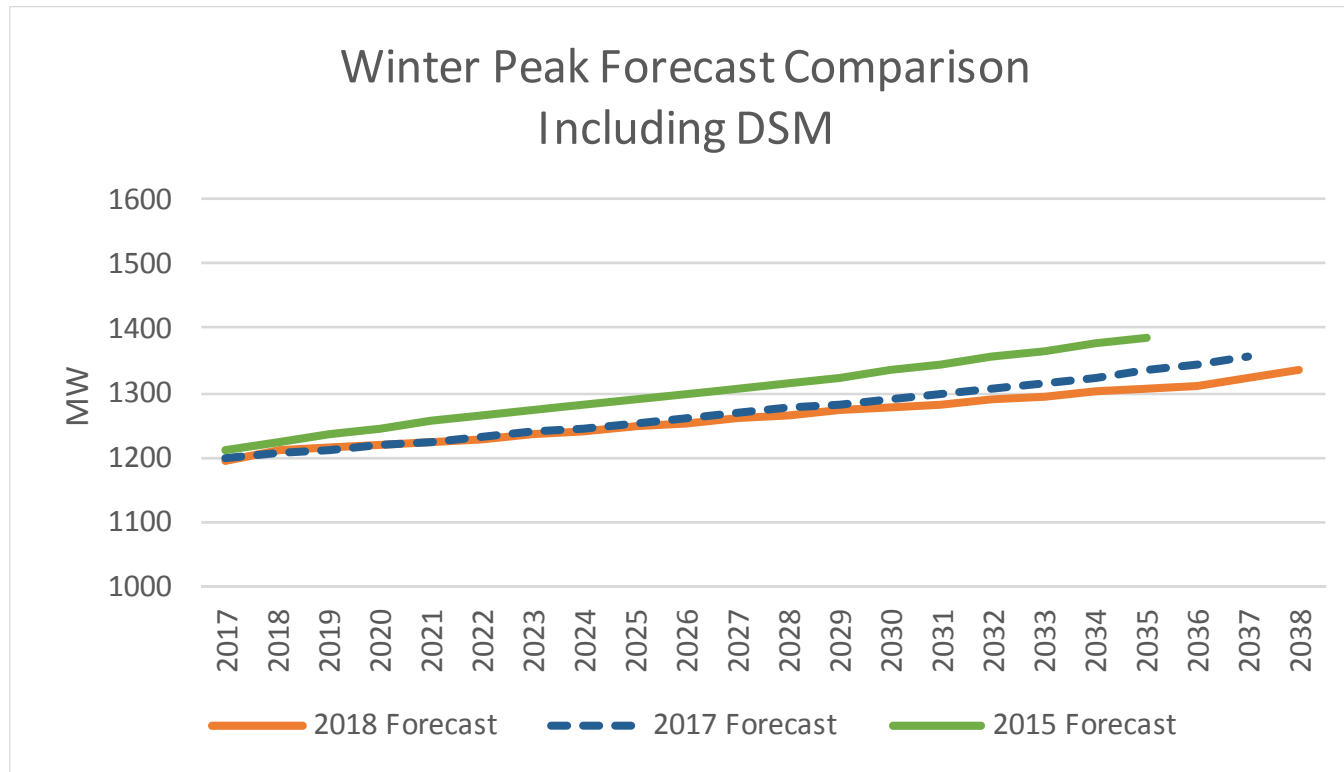


Winter peak forecast results

| Historic and Forecast Values Include Losses | | | | |
|---|------------|------|--------------------|----------|
| Winter | 2018 | Less | Less | 2018 |
| | Regression | DSM | NEM ^{1,2} | Forecast |
| 2012 | 1074 | | | 1074 |
| 2013 | 1272 | | | 1272 |
| 2014 | 1176 | | | 1176 |
| 2015 | 1050 | | | 1050 |
| 2016 | 1163 | | | 1163 |
| 2017 | 1202 | 7 | | 1195 |
| 2018 | 1224 | 15 | | 1210 |
| 2019 | 1236 | 22 | | 1214 |
| 2020 | 1248 | 30 | | 1218 |
| 2021 | 1260 | 37 | | 1222 |
| 2022 | 1271 | 44 | | 1227 |
| 2023 | 1285 | 50 | | 1235 |
| 2024 | 1298 | 56 | | 1241 |
| 2025 | 1310 | 63 | | 1247 |
| 2026 | 1323 | 69 | | 1253 |
| 2027 | 1335 | 76 | | 1259 |
| 2028 | 1348 | 82 | | 1265 |
| 2029 | 1360 | 89 | | 1272 |
| 2030 | 1373 | 95 | | 1278 |
| 2031 | 1385 | 101 | | 1284 |
| 2032 | 1397 | 108 | | 1289 |
| 2033 | 1409 | 114 | | 1295 |
| 2034 | 1421 | 121 | | 1300 |
| 2035 | 1433 | 127 | | 1306 |
| 2036 | 1445 | 134 | | 1311 |
| 2037 | 1456 | 134 | | 1322 |
| 2038 | 1468 | 134 | | 1334 |
| Avg Growth Rate | 0.9% | | | 0.5% |
| Avg Increase (MW) | 12 | | | 6 |
| 1 No NEM impact on Winter peak assumed | | | | |
| 2 Incremental DSM | | | | |

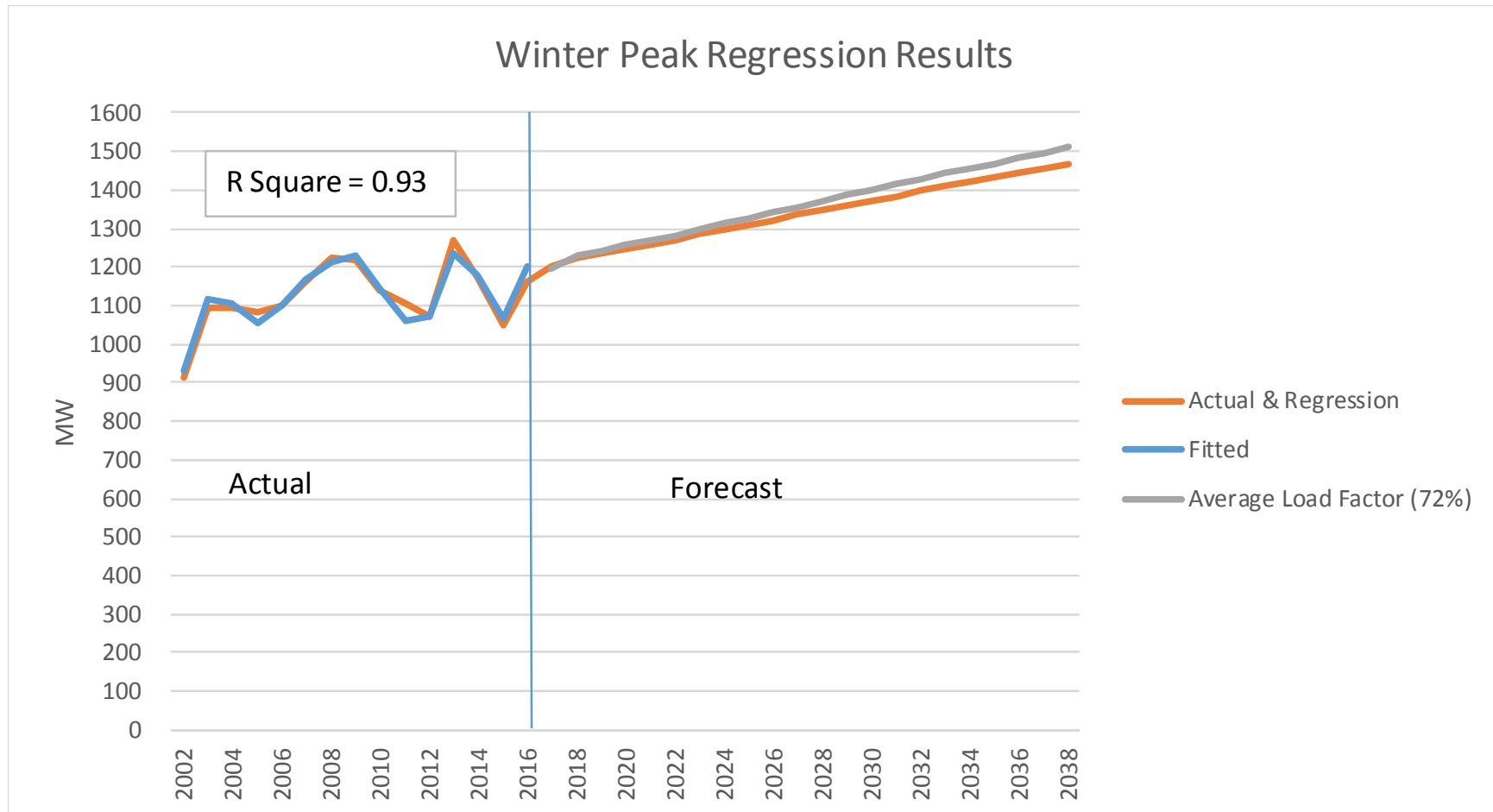


Winter peak forecast results



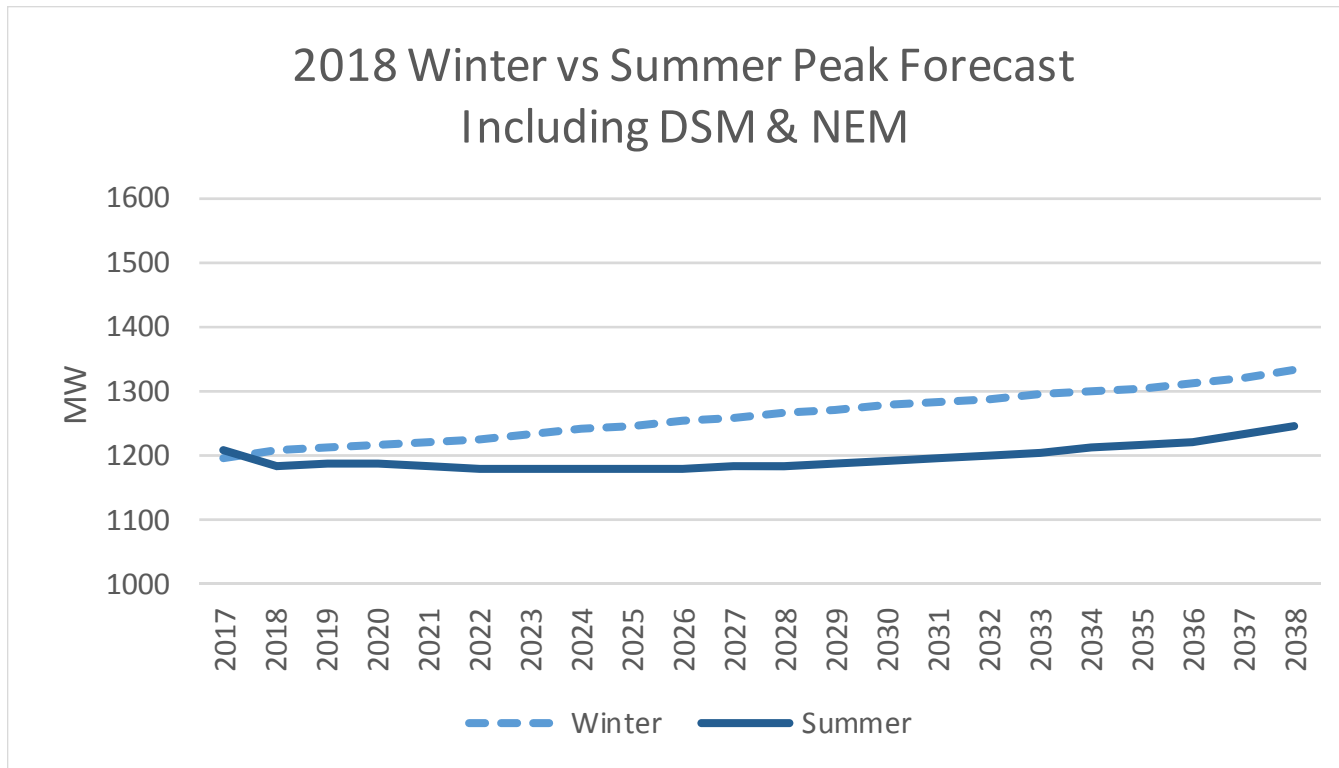


Winter peak forecast regression results



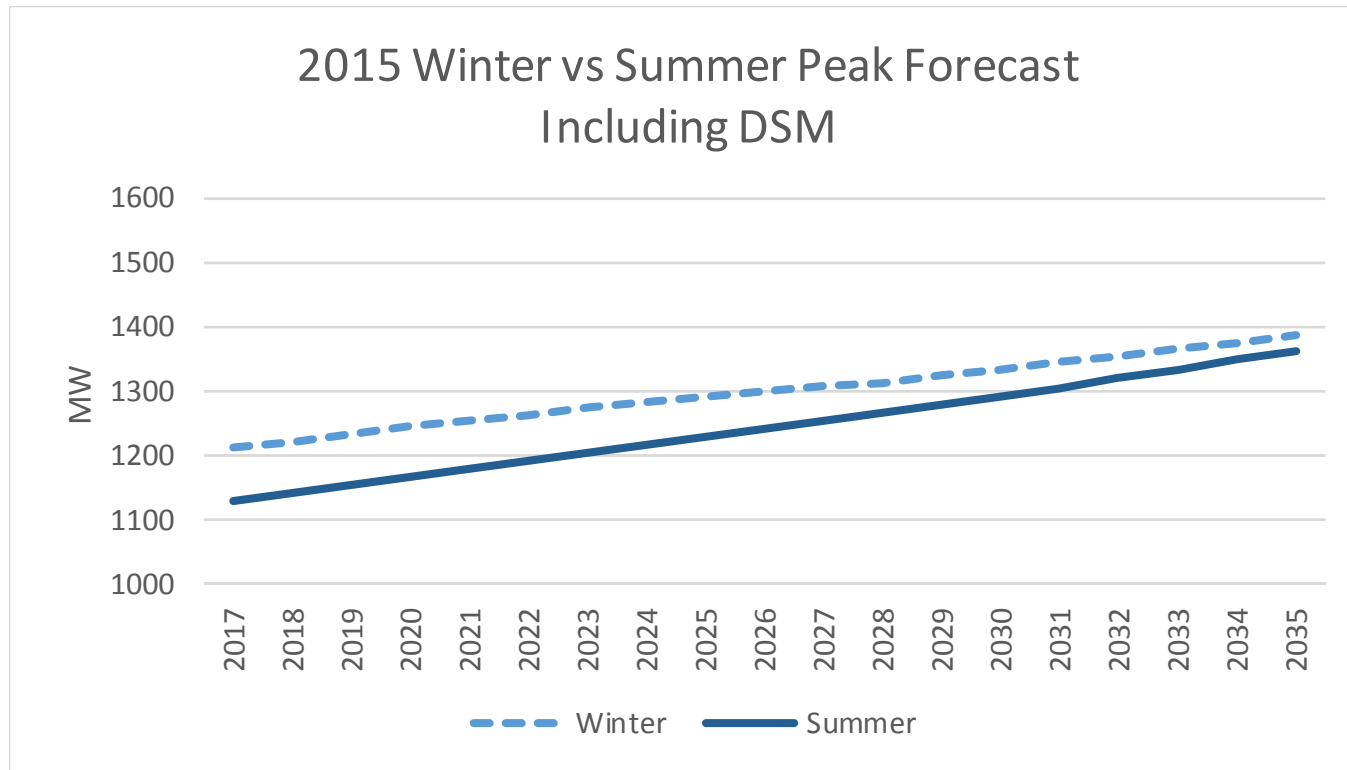


2018 summer vs winter peak forecast





2015 summer vs winter peak forecast





5. Energy forecast



Energy Forecast Methodology

- For forecast years 2023-2038, Residential & GS1 Secondary load forecasts based on regression model using customer counts and 10-year average degree days (normal weather) as explanatory variables
- For forecast years 2018-2022, Residential & GS1 Secondary load forecasts based upon NorthWestern's 5-year plan to capture short-term drivers of electric load growth, such as Bozeman area growth, and to transition from actual loads better
- All other customer classes based on recent actuals or averages, with known changes applied



Default supply forecast

| 20-Year Default Load, Incremental DSM, and Incremental NEM Forecasts | | | | | |
|--|---|--------------------------------------|--|--|---|
| | Default Load Excluding Future DSM & NEM | Incremental DSM Energy Savings | Incremental NEM - Photovoltaic Installed MW | Incremental NEM - Photovoltaic aMW @ 15% CF | Default Load Including Future DSM & NEM |
| | aMW | aMW | Installed MW | aMW @ 15% CF | aMW |
| 2018 | 775 | 5 | 8 | 1 | 769 |
| 2019 | 783 | 9 | 20 | 3 | 771 |
| 2020 | 792 | 14 | 36 | 6 | 772 |
| 2021 | 800 | 19 | 56 | 9 | 772 |
| 2022 | 808 | 23 | 77 | 13 | 772 |
| 2023 | 819 | 27 | 97 | 16 | 776 |
| 2024 | 828 | 31 | 117 | 20 | 778 |
| 2025 | 837 | 35 | 135 | 23 | 780 |
| 2026 | 847 | 39 | 153 | 26 | 782 |
| 2027 | 856 | 43 | 169 | 28 | 784 |
| 2028 | 865 | 48 | 185 | 31 | 786 |
| 2029 | 874 | 52 | 197 | 33 | 789 |
| 2030 | 883 | 56 | 207 | 35 | 793 |
| 2031 | 892 | 60 | 217 | 36 | 796 |
| 2032 | 901 | 64 | 225 | 38 | 799 |
| 2033 | 910 | 68 | 232 | 39 | 803 |
| 2034 | 918 | 72 | 238 | 40 | 806 |
| 2035 | 927 | 76 | 244 | 41 | 810 |
| 2036 | 935 | 80 | 249 | 42 | 813 |
| 2037 | 944 | 80 | 254 | 43 | 821 |
| 2038 | 952 | 80 | 259 | 43 | 828 |
| Avg Growth Rate | 1.0% | 15.2% | 18.9% | 18.9% | 0.4% |
| All values include losses except NEM - Photovoltaic Installed MW | | | | | |



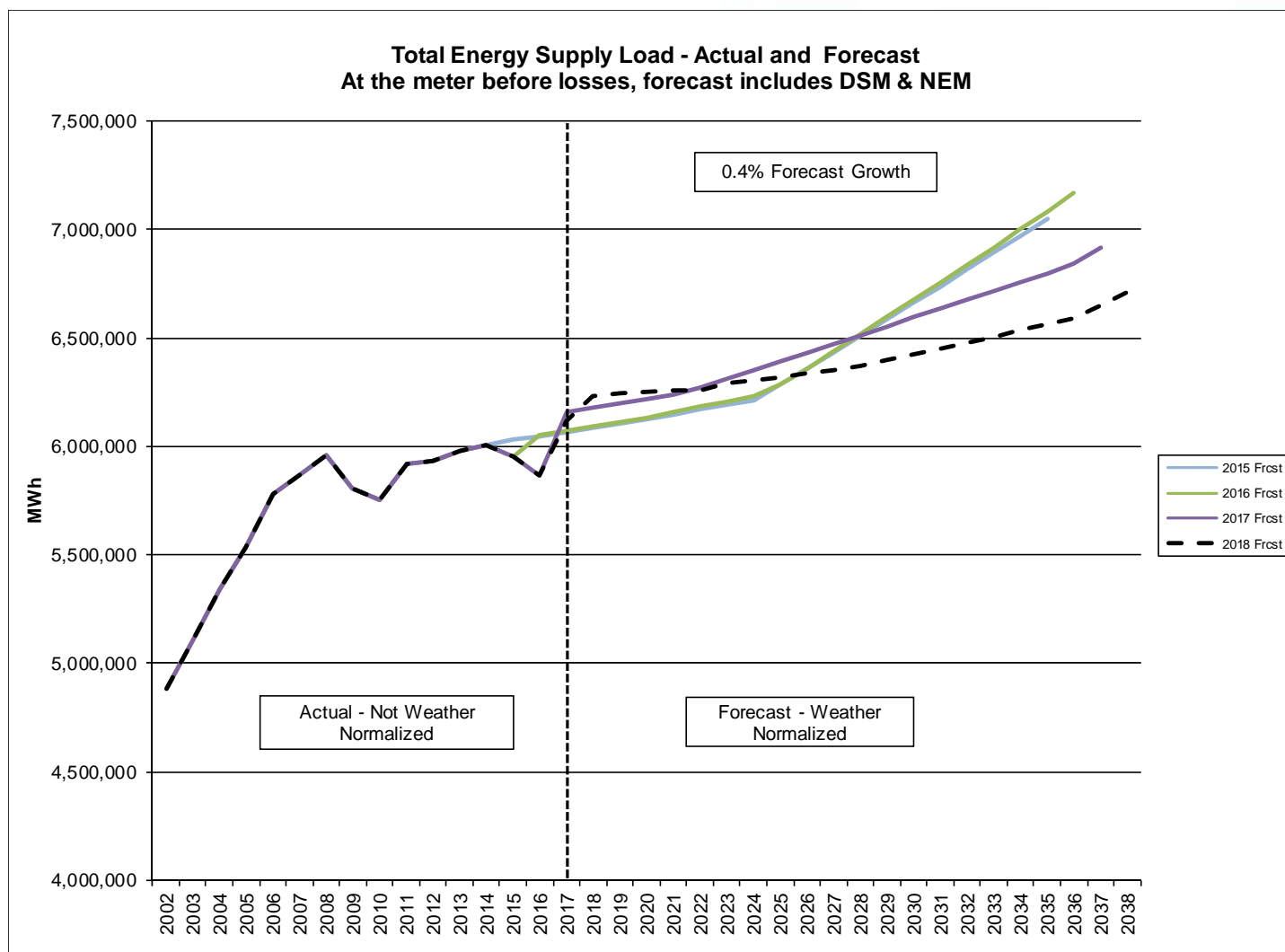
20-year load forecast

NorthWestern Energy
 Long-term Load Forecast
 Includes Losses, DSM, and Solar PV-NEM

| Year | Total Control Area | Annual Growth Rate | Default Supply | Annual Growth Rate | Industrial | Annual Growth Rate | Commercial | Annual Growth Rate | Residential | Annual Growth Rate |
|------------|--------------------|--------------------|----------------|--------------------|------------|--------------------|------------|--------------------|-------------|--------------------|
| 2000 | 8,361,848 | | 5,624,145 | | 3,030,843 | | 2,987,179 | | 2,149,361 | |
| 2005 | 8,815,242 | 1.1% | 5,980,373 | 1.2% | 3,168,680 | 0.9% | 3,230,839 | 1.6% | 2,244,640 | 0.9% |
| 2010 | 8,953,396 | 0.3% | 6,218,232 | 0.8% | 2,870,753 | -2.0% | 3,401,472 | 1.0% | 2,518,232 | 2.3% |
| 2015 | 9,280,410 | 0.7% | 6,434,595 | 0.7% | 3,078,540 | 1.4% | 3,454,868 | 0.3% | 2,555,131 | 0.3% |
| 2020 | 10,557,407 | 2.6% | 6,758,899 | 1.0% | 4,038,133 | 5.6% | 3,582,170 | 0.7% | 2,743,708 | 1.4% |
| 2025 | 10,728,008 | 0.3% | 6,828,790 | 0.2% | 4,145,564 | 0.5% | 3,607,169 | 0.1% | 2,781,879 | 0.3% |
| 2030 | 10,841,837 | 0.2% | 6,942,619 | 0.3% | 4,145,564 | 0.0% | 3,656,734 | 0.3% | 2,846,143 | 0.5% |
| 2035 | 10,993,383 | 0.3% | 7,094,165 | 0.4% | 4,145,564 | 0.0% | 3,743,862 | 0.5% | 2,910,562 | 0.4% |
| 20-YR CAGR | | 0.5% | | 0.4% | | 1.5% | | 0.5% | | 0.4% |

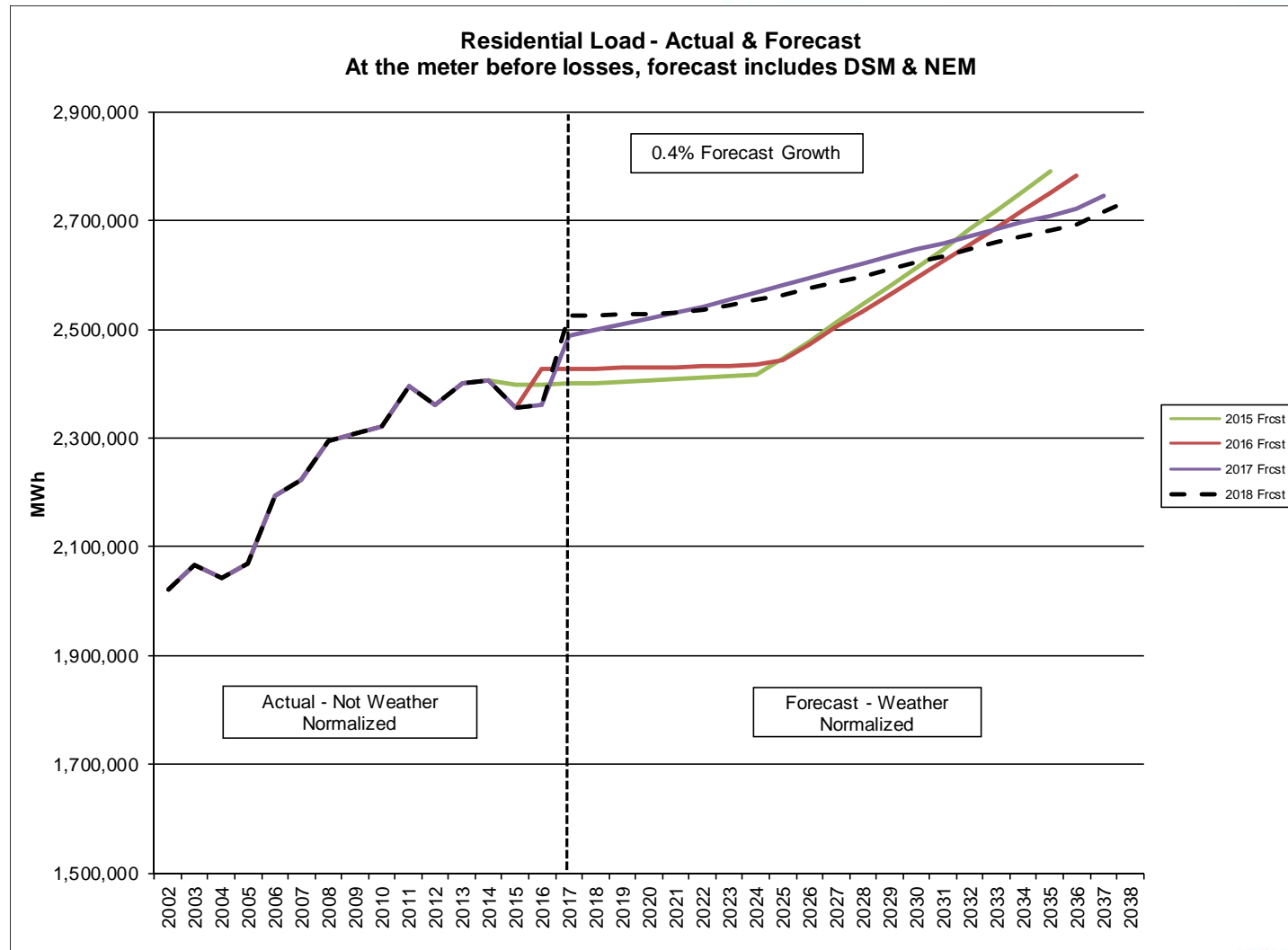


Default supply forecast



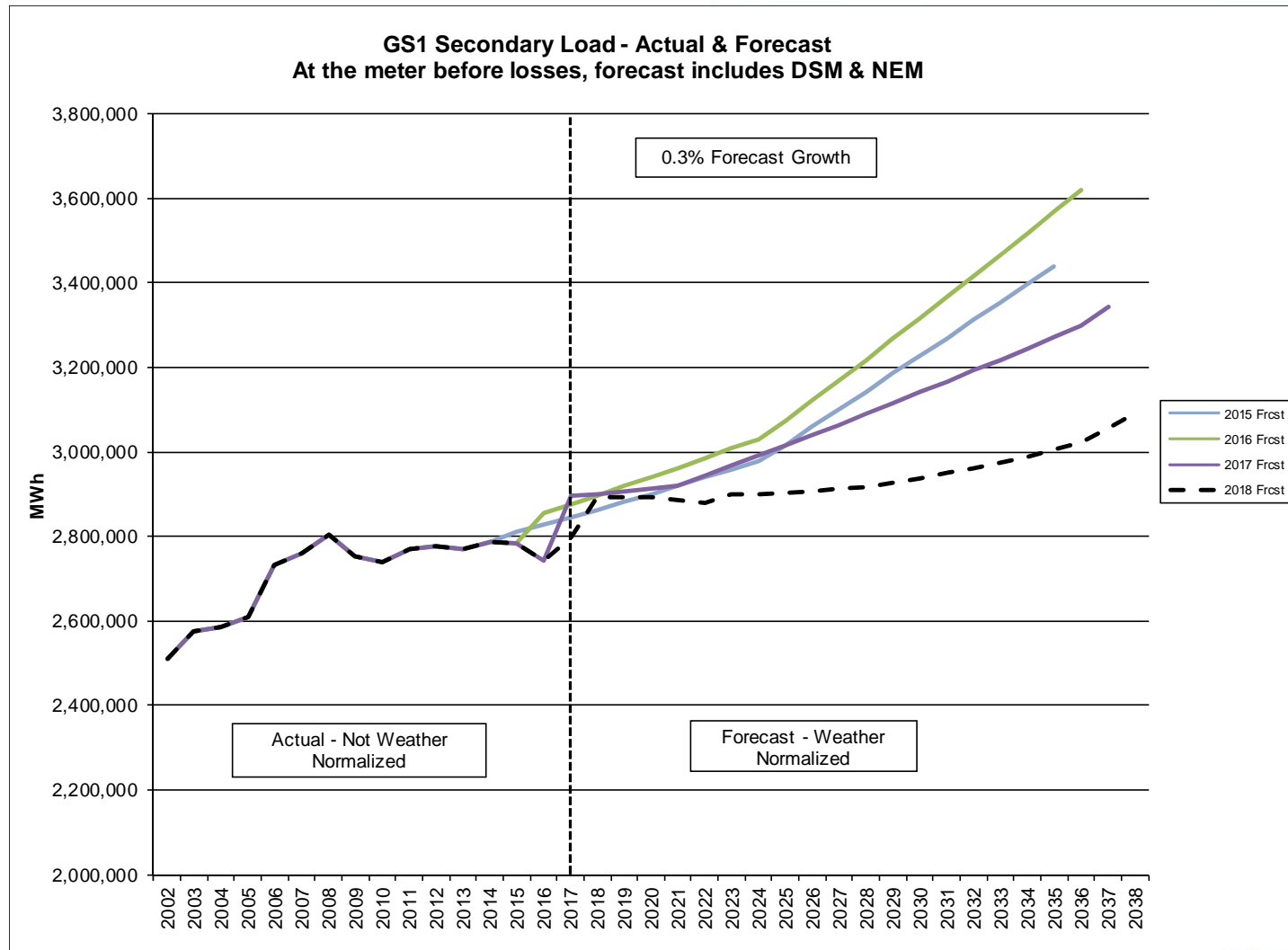


Residential forecast



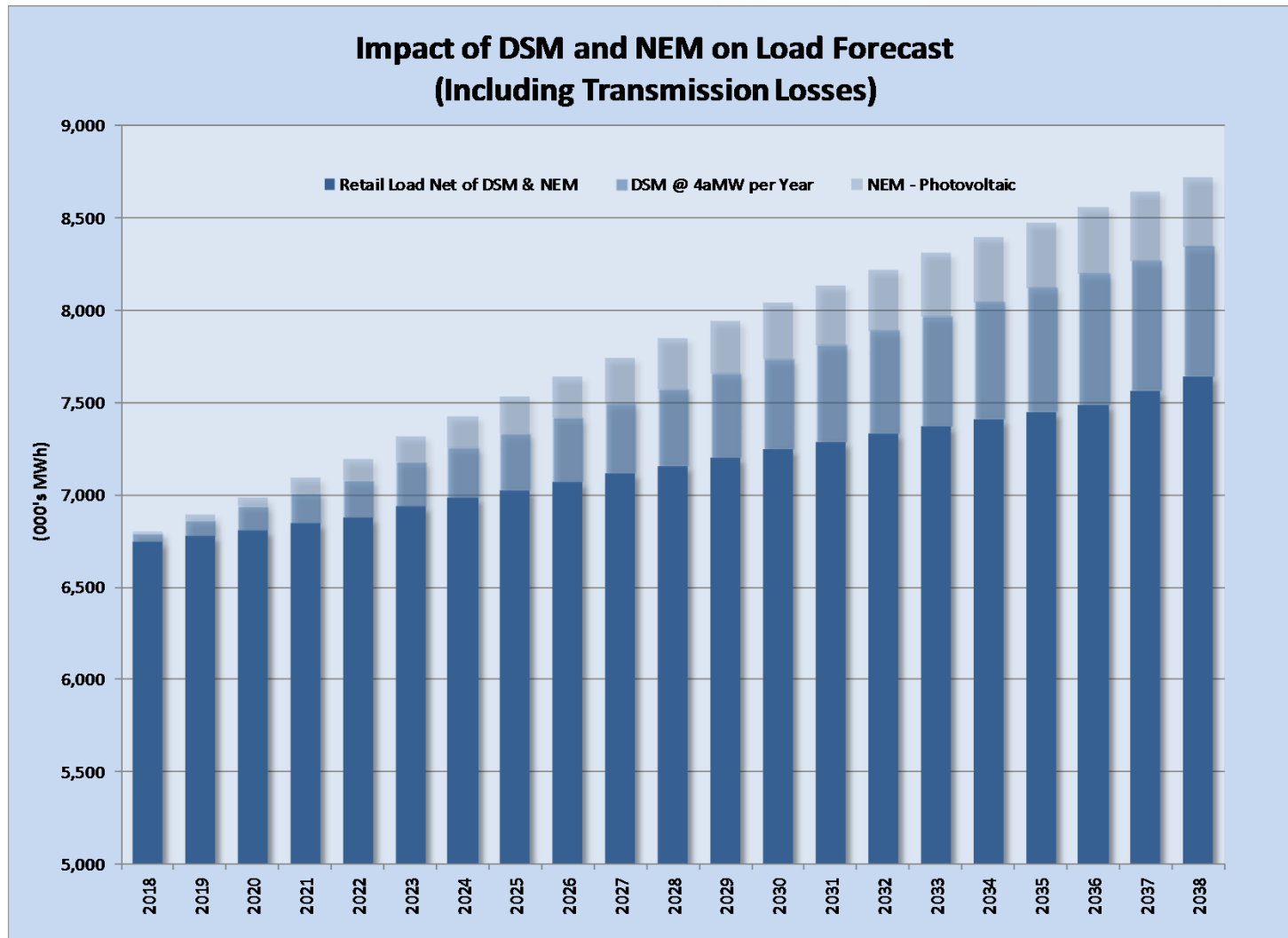


GS1 Secondary forecast



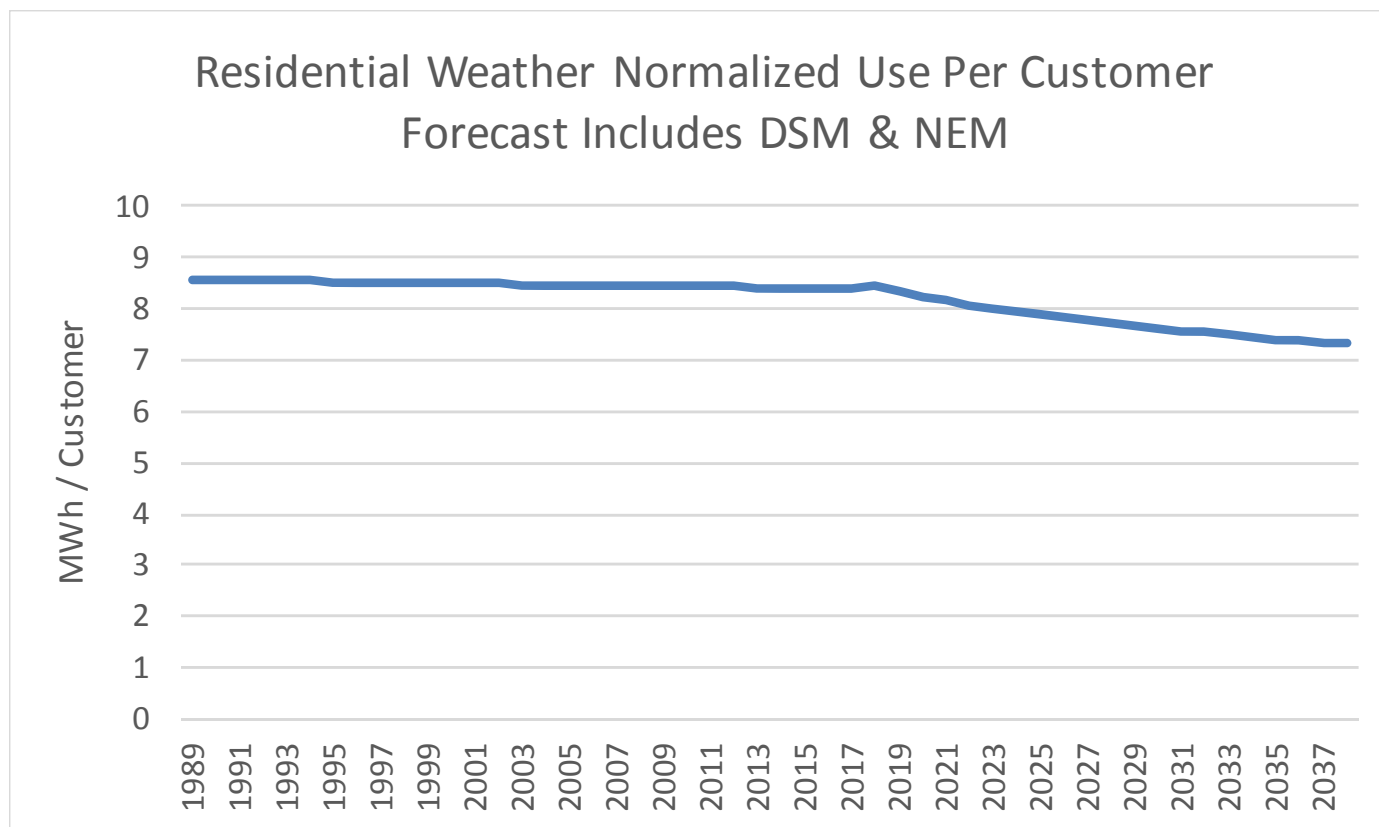


Default supply load and DSM/NEM forecast



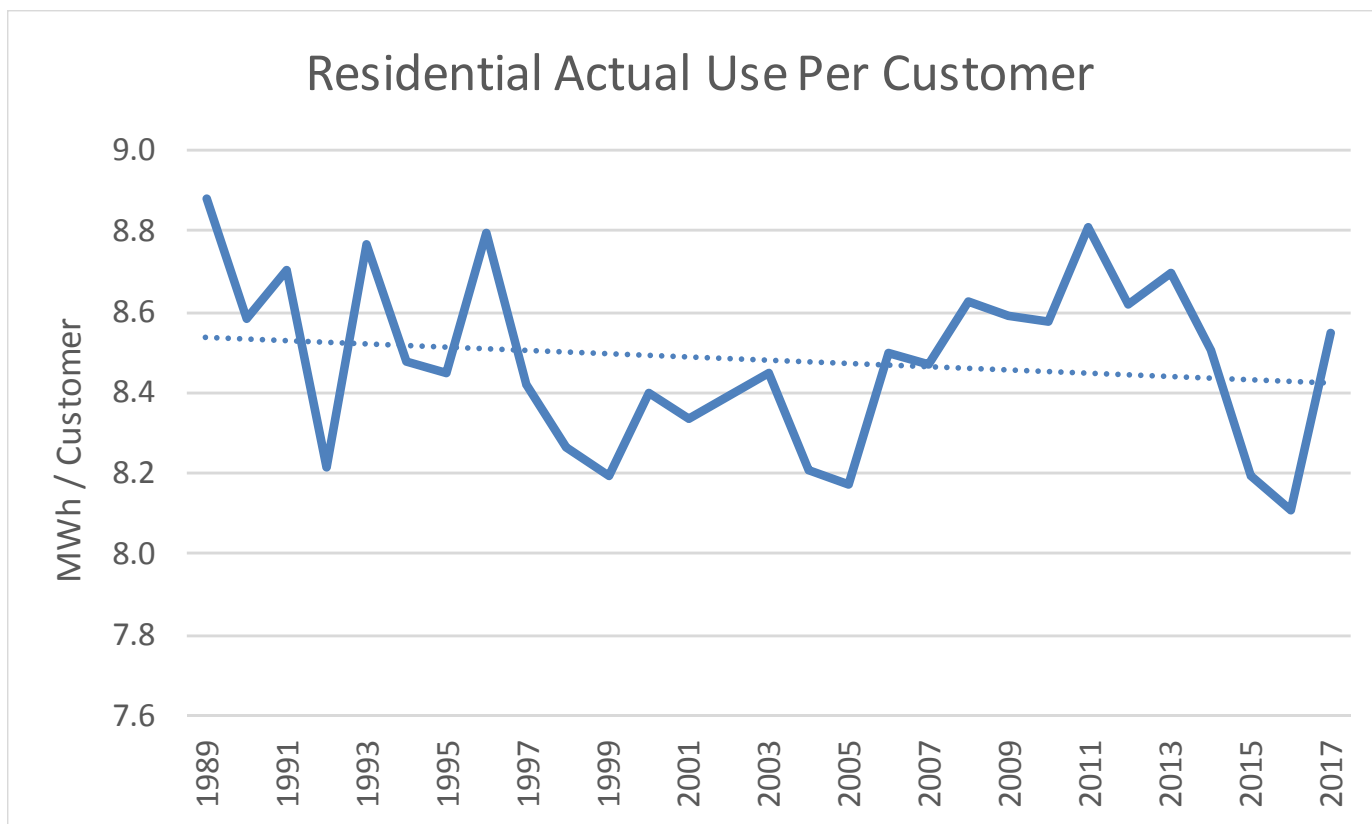


Residential use per customer



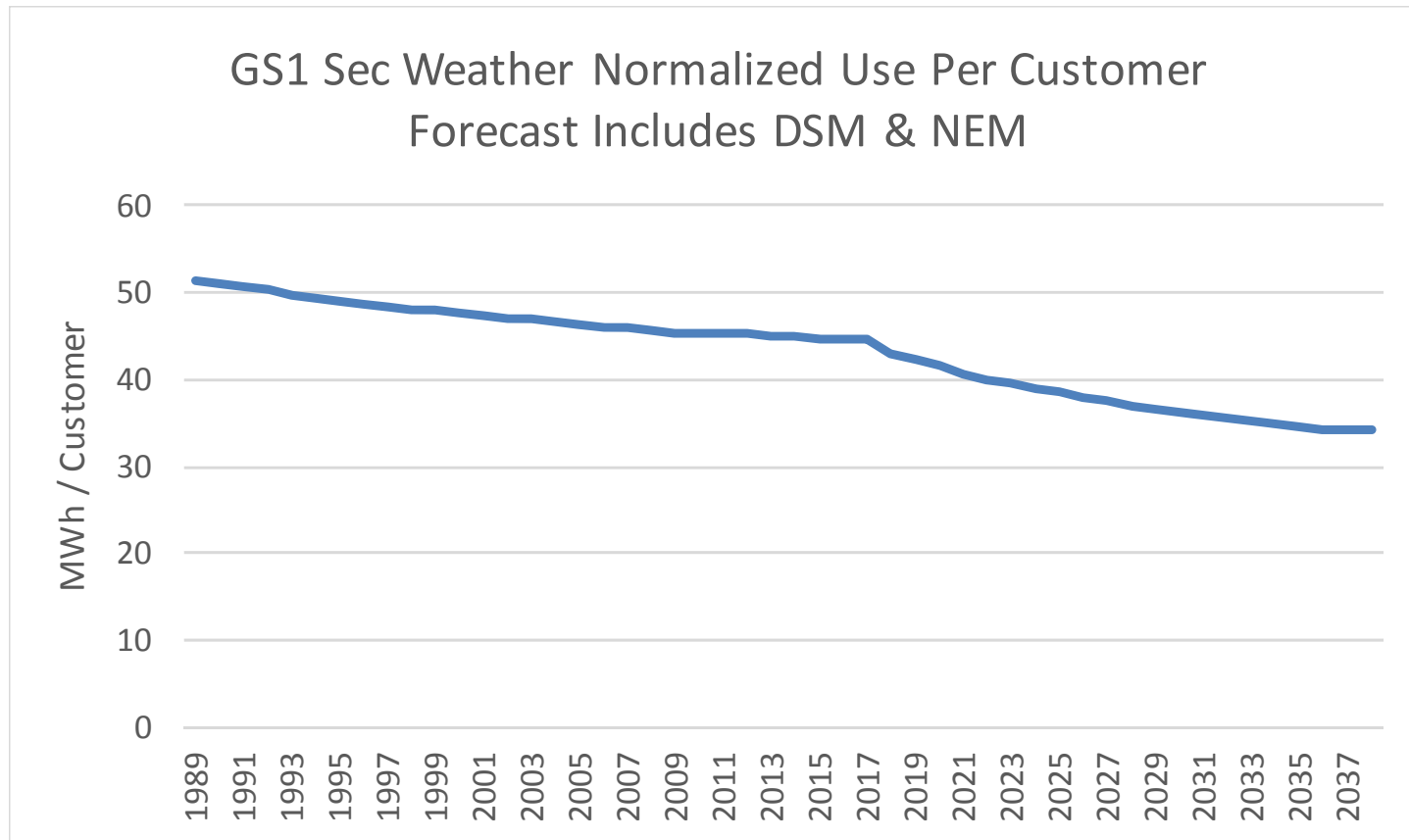


Residential use per customer



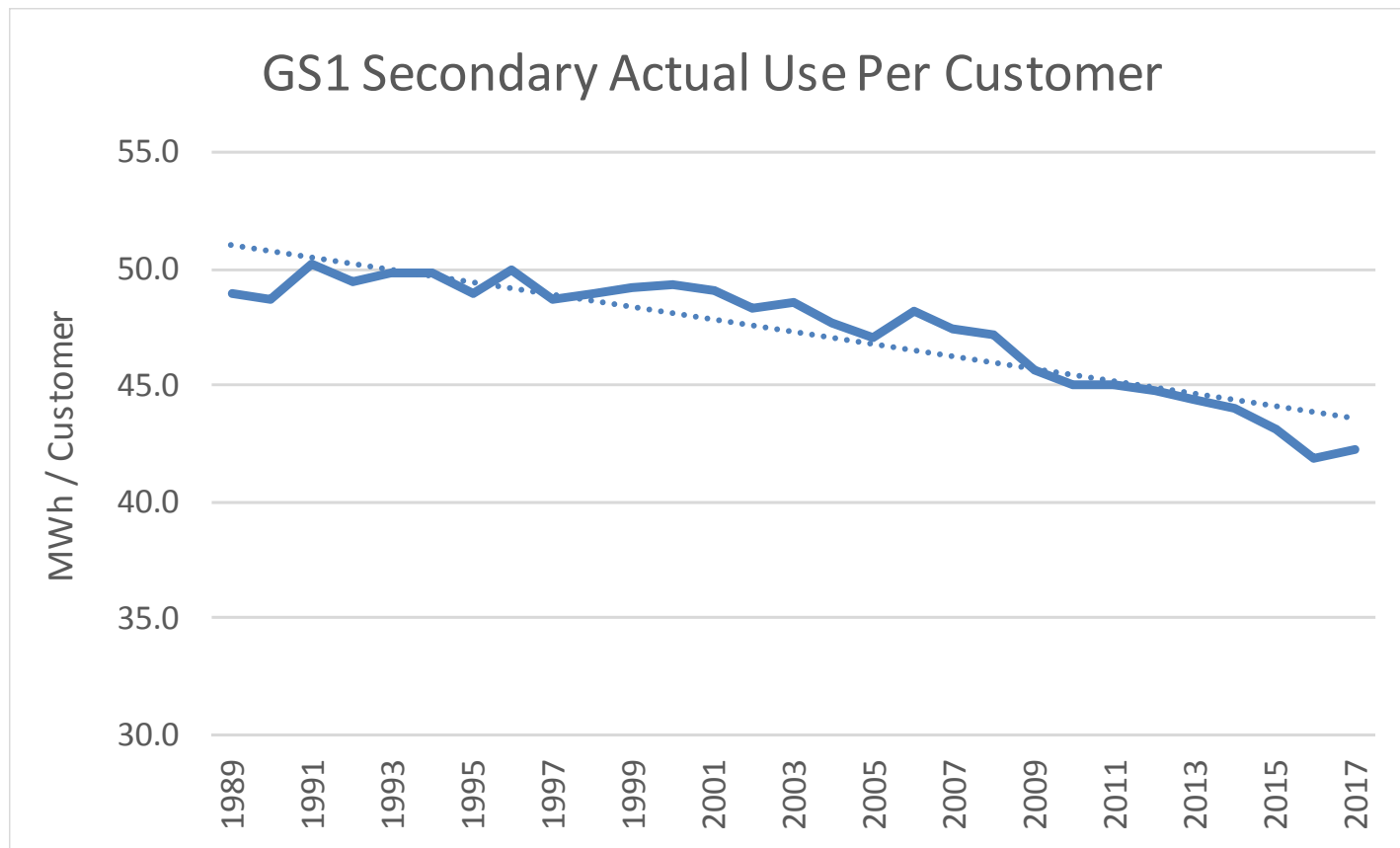


GS1 Secondary use per customer





GS1 Secondary use per customer





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