

Appendix E

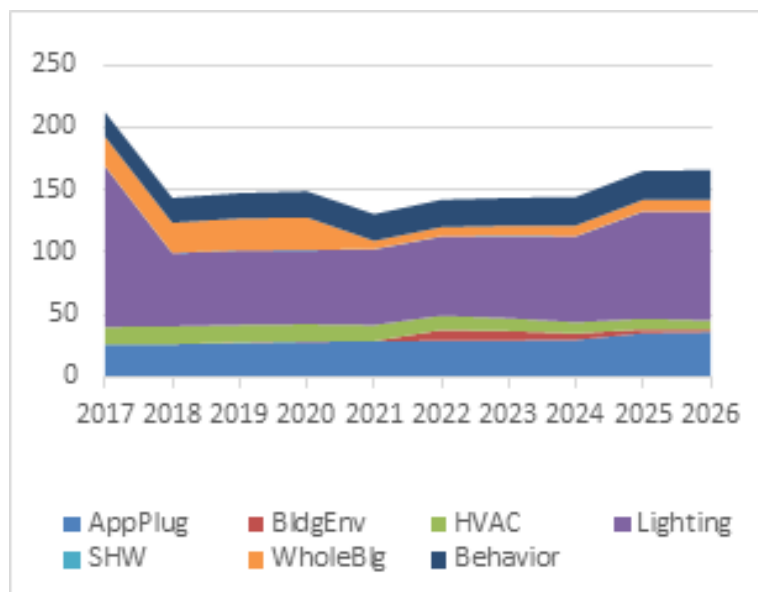
Energy and Demand Savings Potential By Sector

Appendix E – Energy and Demand Savings Potential by Sector

A. Residential Market Potential

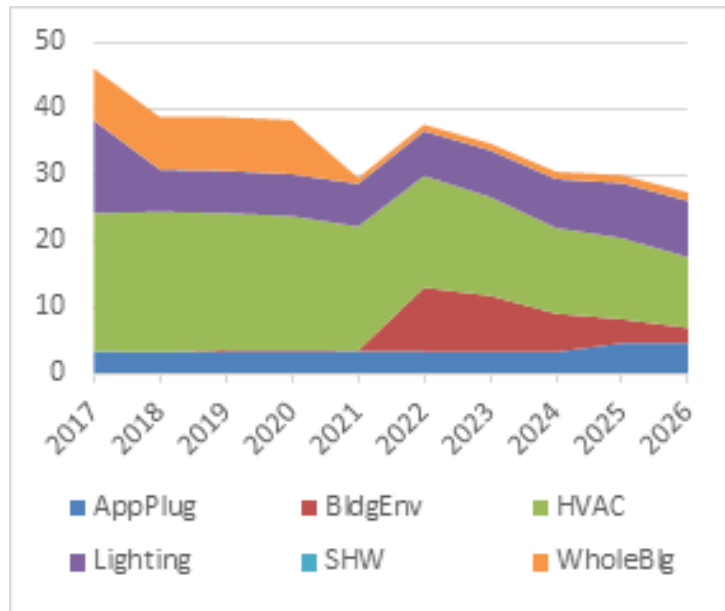
Figures 1 and 2 break out SCE's potential for the residential sector by end use. SCE's market potential is a subset of economic potential and included expected EE savings based on anticipated program funding levels and customer participation given market influences and barriers. Table 1 and Table 2 show GWh and MW potential savings by residential sub-sector for 2017 – 2024.

Figure 1. Residential GWh Market Potential¹



¹ Navigant AB802 Technical Analysis "Pre-802 Framework."

Figure 2. Residential MW Market Potential²



The Residential Sector's primary areas of potential remain in the lighting end use within the Single-family market followed by appliances and whole building end use which are similar in orders of magnitude. Recent changes between the 2015 Potential Goal Study³ and AB 802 Technical Analysis⁴ view on historical EE savings shows an increase in HVAC potential due to "modelling changes and an increased adoption of to-code systems" as well as an increase in the Service Hot Water end use. Navigant's analysis also shows that HVAC, in the residential sector, must steer efforts to capturing Stranded Potential, defined as "capturing savings from old equipment beyond its useful life" and not capture savings expected through the regular turnover of equipment in the market. As noted by Navigant, targeting HVAC measures will be beneficial for reducing these risks and is less applicable for measures targeting the building envelope.

A further investigation into the 2017-2024 market potential demonstrated significant changes in the residential sector as it is viewed today. The Potential Study reports near term declining IOU program market potential. The majority of the decrease in market potential can be

² *Id.*

³ "Energy Efficiency Potential and Goals Study for 2015 and Beyond," Navigant Consulting, Inc., Sept. 2015.

⁴ Navigant AB802 Technical Analysis "Pre-802 Framework."

attributed to a changes in lighting codes but a few other factors will continue to shift the sector's potential:

Table 1. Residential GWh Market Potential ⁵

Sector	2017	2018	2019	2020	2021	2022	2023	2024
MF	22.2	15.5	16.6	15.7	9.9	10.5	11.1	12.0
SF	163.5	99.5	101.0	100.8	88.0	90.3	92.4	94.9
Res.⁶	205	135	138	137	119	123	126	130

Table 2. Residential MW Market Potential⁷

Sector	2017	2018	2019	2020	2021	2022	2023	2024
MF	4.0	3.4	3.5	3.4	1.1	1.1	1.2	1.5
SF	31.6	23.7	22.9	21.9	16.0	15.3	14.6	14.1
Res.	36	27	26	25	17	16	16	16

B. Commercial Market Potential

The Commercial sector has primarily Lighting, Whole Building, and HVAC Achievable Potential⁸ through 2026. See Figures 5 and 6 for the Commercial sector's Achievable Potential by GWh and MW, broken out by end use.

⁵ "Energy Efficiency Potential and Goals Study for 2015 and Beyond," Navigant Consulting, Inc., Sept. 2015.

⁶ Difference between sub segments and totals is due to associate behavior potential.

⁷ *Id.*

⁸ Achievable Potential is defined as the cost-effective Technical Potential (by measure TRC) and then filtered to the energy efficiency savings that could be expected in response to specific levels of incentives and assumptions about policies, market influences, and barriers. Technical Potential is defined as the amount of energy savings that would be possible if the highest level of efficiency for all technically applicable opportunities to improve energy efficiency were taken. Technical potential represents the immediate replacement of applicable equipment-based technologies regardless of the remaining useful life of the existing measure.

Figure 3. Achievable Potential (Commercial Sector, GWh, 2016-2026)⁹

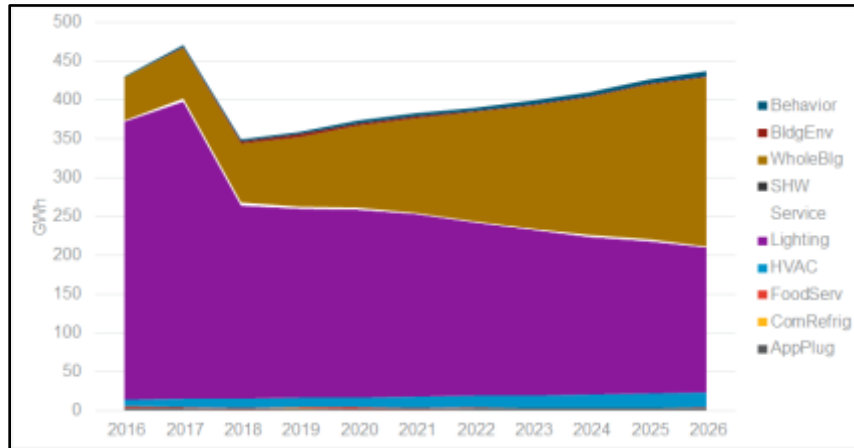
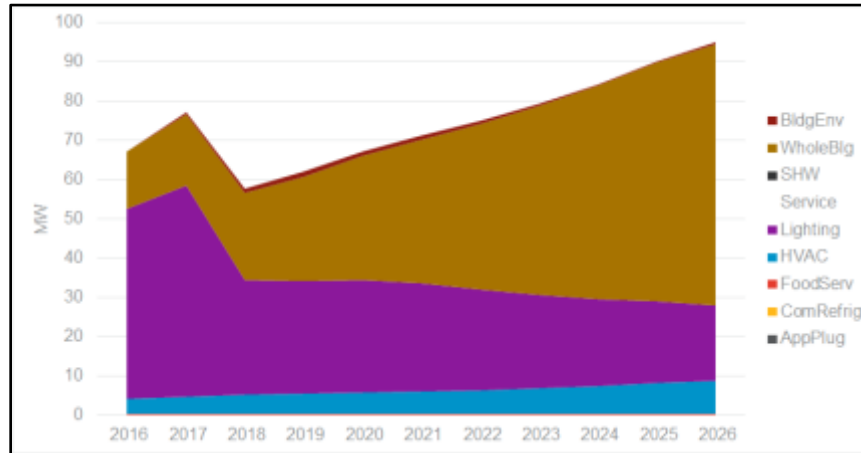


Figure 4. Achievable Potential (Commercial Sector, MW, 2016-2026)¹⁰



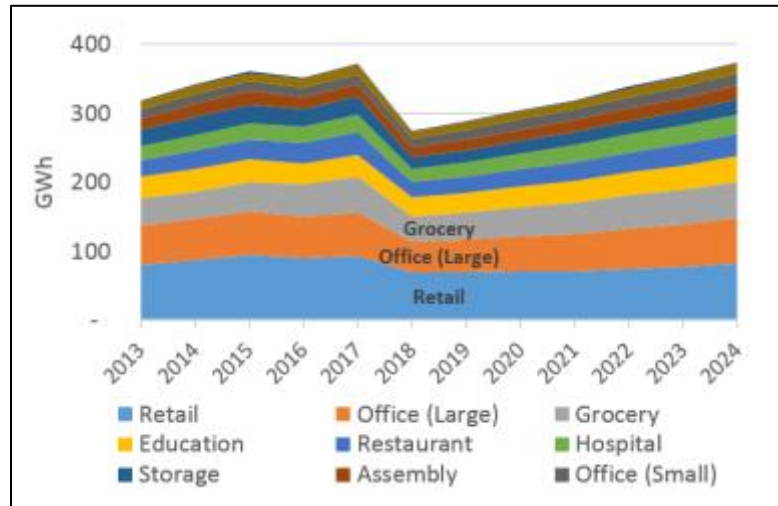
By Building Type, the top three are Retail, Offices (Large) and Groceries (see Figure 5).¹¹

⁹ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016. *Note:* The savings are pre-AB 802 savings. BldgEnv = Building Envelope, WholeBlg = Whole Building, SHW Service = Stored Hot Water Service, Food Serv = Food Service, ComRefrig = Commercial Refrigeration, and AppPlug = Appliances and Plug Loads.

¹⁰ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016. *Note:* The savings above are pre-AB 802 savings. BldgEnv = Building Envelope, WholeBlg = Whole Building, SHW Service = Stored Hot Water Service, Food Serv = Food Service, ComRefrig = Commercial Refrigeration, and AppPlug = Appliances and Plug Loads.

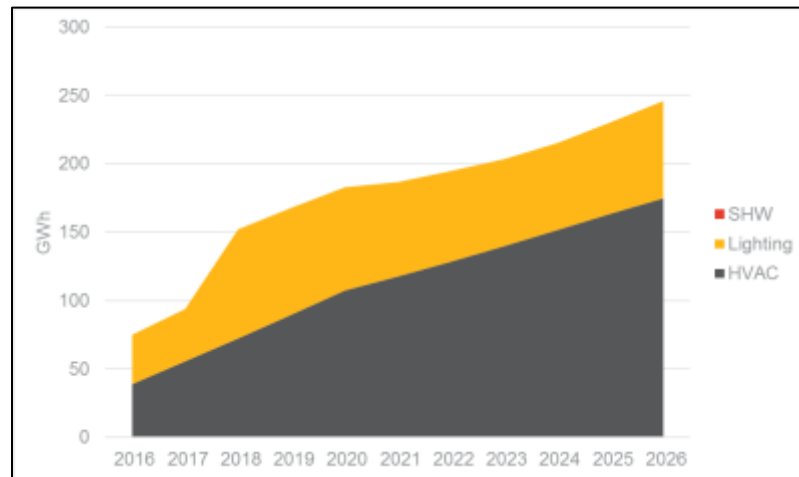
¹¹ "Energy Efficiency Potential and Goals Study for 2015 and Beyond," Navigant, Sept. 2015.

Figure 5. Commercial Sector Potential by Building Type



Figures 6 and 7 below show the incremental Stranded Potential (GWh and MW) unlocked due to AB 802 in the Commercial sector. This overall is +10-20% or 20-30% of the original Achievable Potential (by GWh and MW, respectively).¹²

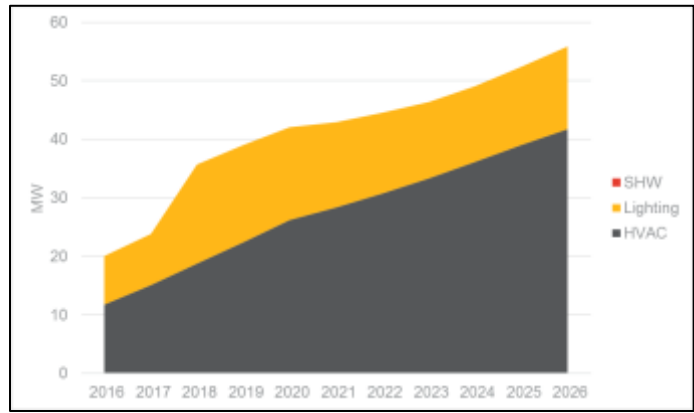
Figure 6. AB 802 Stranded Potential (Commercial Sector, GWh, 2016-2026)¹³



¹² AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016.

¹³ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016. SHW Service = Stored Hot Water Service.

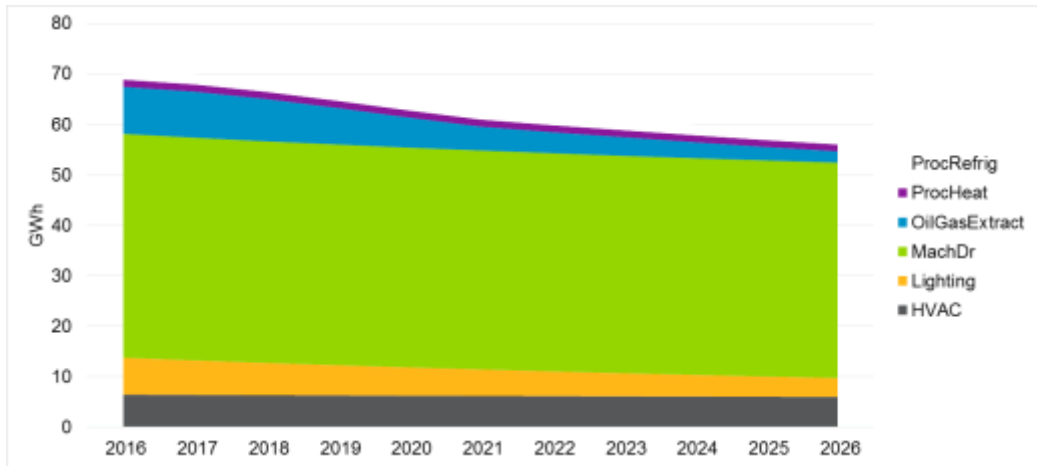
Figure 7. AB 802 Stranded Potential (Commercial Sector, MW, 2016-2026)¹⁴



C. Industrial Market Potential

The Industrial sector has primarily Machine Drive, Lighting, and HVAC Achievable Potential through 2026. See Figures 8 and 9 for the Industrial sector's Achievable Potential pre-AB 802 by GWh and MW broken out by End Use, respectively.

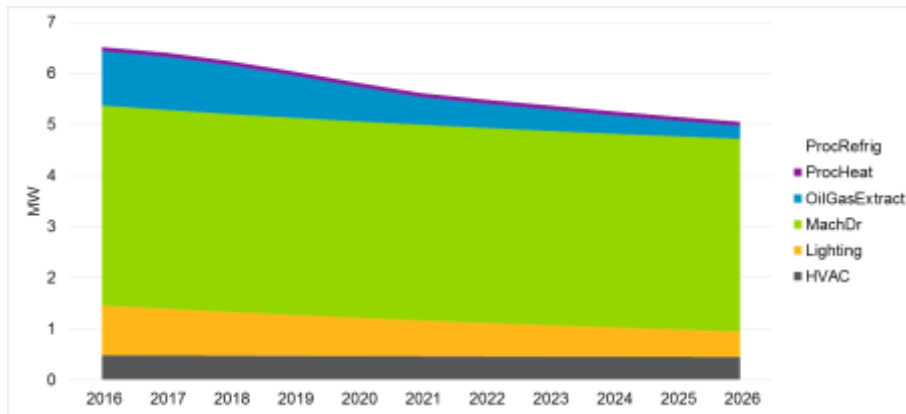
Figure 8. Achievable Potential (Industrial Sector, GWh, 2016-2026)¹⁵



¹⁴ Ibid.

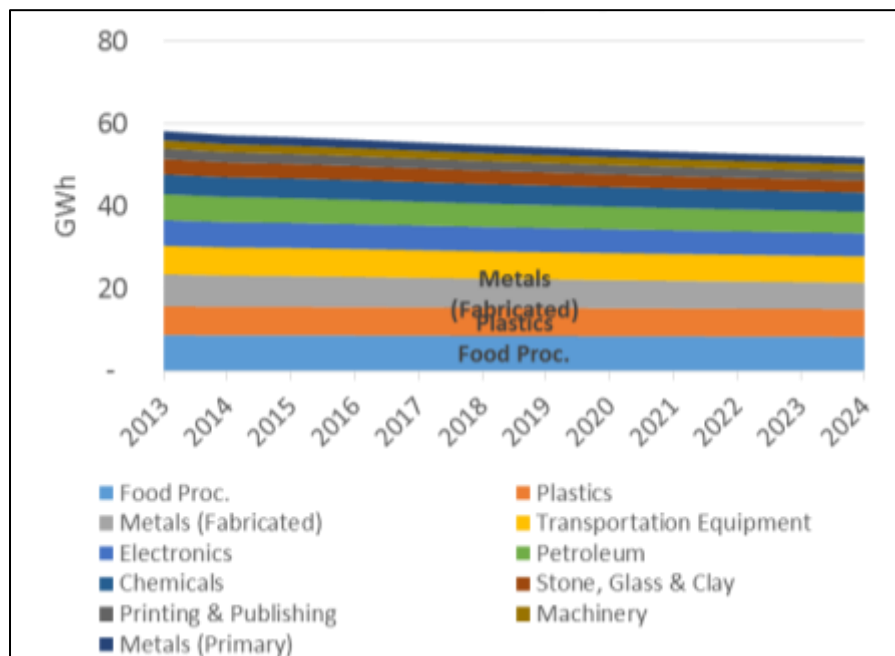
¹⁵ *AB 802 Technical Analysis – Potential Savings Analysis*, Navigant, March 2016. *Note*: The savings above are pre-AB 802 savings. ProcRefrig = Process Refrigeration, ProcHeat = Process Heat, OilGasExtract = Oil & Gas Extraction, MachDr = Machine Drive (e.g., motors, pumps, etc.).

Figure 9. Achievable Potential (Industrial Sector, MW, 2016-2026)¹⁶



The top three Industrial segments in terms of potential savings are Food Processing, Plastics, and Metals (Fabricated).

Figure 10. Industrial Potential by Segment¹⁷



The latest Navigant study regarding AB 802 stranded and operational savings potential only addressed Residential and Commercial sectors. The CPUC plans to update the 2018 Potential & Goals study with further AB 802 savings potential detail in 2017.¹⁸

¹⁶ Ibid.

¹⁷ "Energy Efficiency Potential and Goals Study for 2015 and Beyond," Navigant, Sept. 2015.

¹⁸ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016.

D. Agricultural Sector Market Potential

The Agricultural sector has primarily Machine Drive and Process Refrigeration Achievable Potential through 2026. The top potential is Machine Drive (e.g., Pumps). This indicates that maintaining a sustainable pump-related program is important to achieving this potential. See Figures 11 and 12 for the Agricultural sector's Achievable Potential GWh and MW respectively, broken out by End Use.

Figure 11. Achievable Potential (Agricultural Sector, GWh, 2016-2026)¹⁹

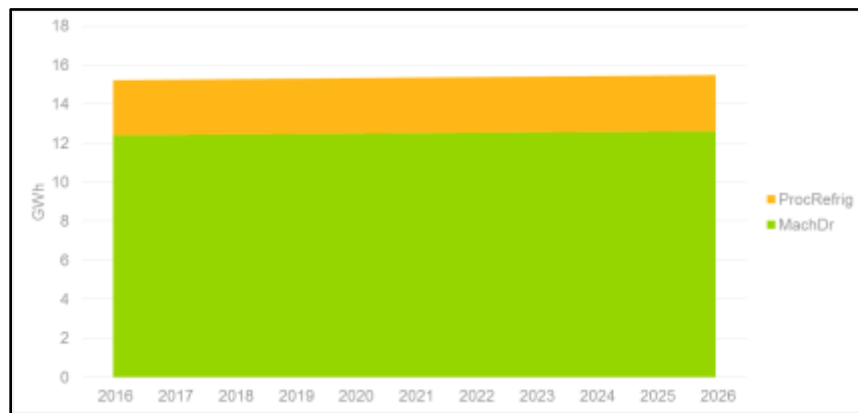
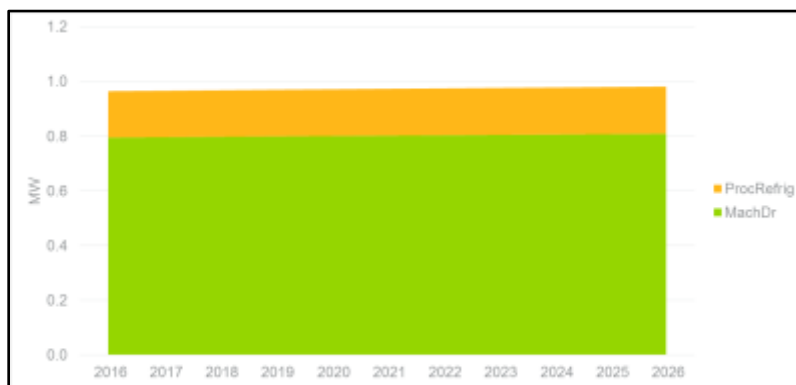


Figure 12. Achievable Potential (Agricultural Sector, MW, 2016-2026)²⁰

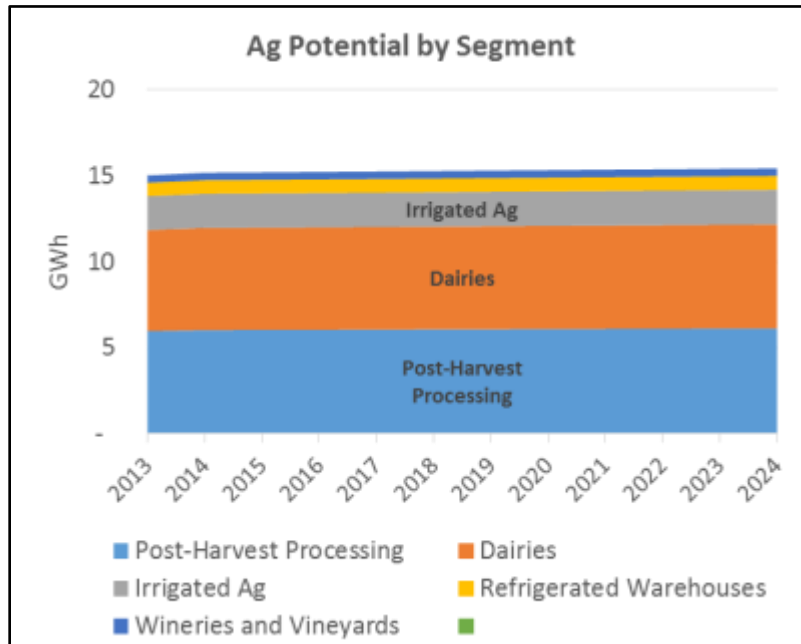


¹⁹ AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016. *Note:* The savings above are pre-AB 802 savings.

²⁰ Ibid.

By Segment, the top potential is Post-Harvest Processing (e.g., nut-shelling), Dairies, and Irrigated Ag.²¹

Figure 13. Agricultural Potential by Segment



The latest Navigant study regarding AB 802 stranded and operational savings potential only addressed Residential and Commercial sectors. The CPUC plans to update the 2018 Potential & Goals study with further AB 802 savings potential detail in 2017.²²

²¹ Please note that these are Navigant's Agricultural customer segments, and there is not enough detail in that study to break this out by the industries' recognized customer segments.

²² AB 802 Technical Analysis – Potential Savings Analysis, Navigant, March 2016.