Southwestern Public Service Company

Sales and Load Forecasting

New Mexico Resource Plan Public Advisory Meeting

March 27, 2018

Used for Planning Purposes Only

Agenda

- Energy and peak demand forecasting process
- Economic and demographic assumptions
- Weather assumptions
- Forecast adjustments
- Energy and peak demand forecast results
- SE New Mexico oil development
- Forecast scenarios

Forecasting Process

- 30-year forecasts of monthly customers, sales and peak demand are developed using primarily regression analysis.
- Retail sales are forecast by major class and by state.
- Retail peak demand is forecast at the aggregated company level.
- Wholesale sales and peak demand are forecast by individual customer.

Regression Analysis

- Use statistical relationships between monthly sales or demand and explanatory variables such as economics, weather, customers, and price of electricity. Once a statistical relationship is established from historical data, the relationship is applied to the forecast of the explanatory variables to derive a sales or demand forecast. This process is referred to as regression analysis.
  - For example: Residential sales = *f* (number of customers, weather, household income)
- Strengths: industry standard, robust, test results, defines relationships, adaptable/flexible
- Weaknesses: historical relationships can change, limited by available data, extremes can create challenges

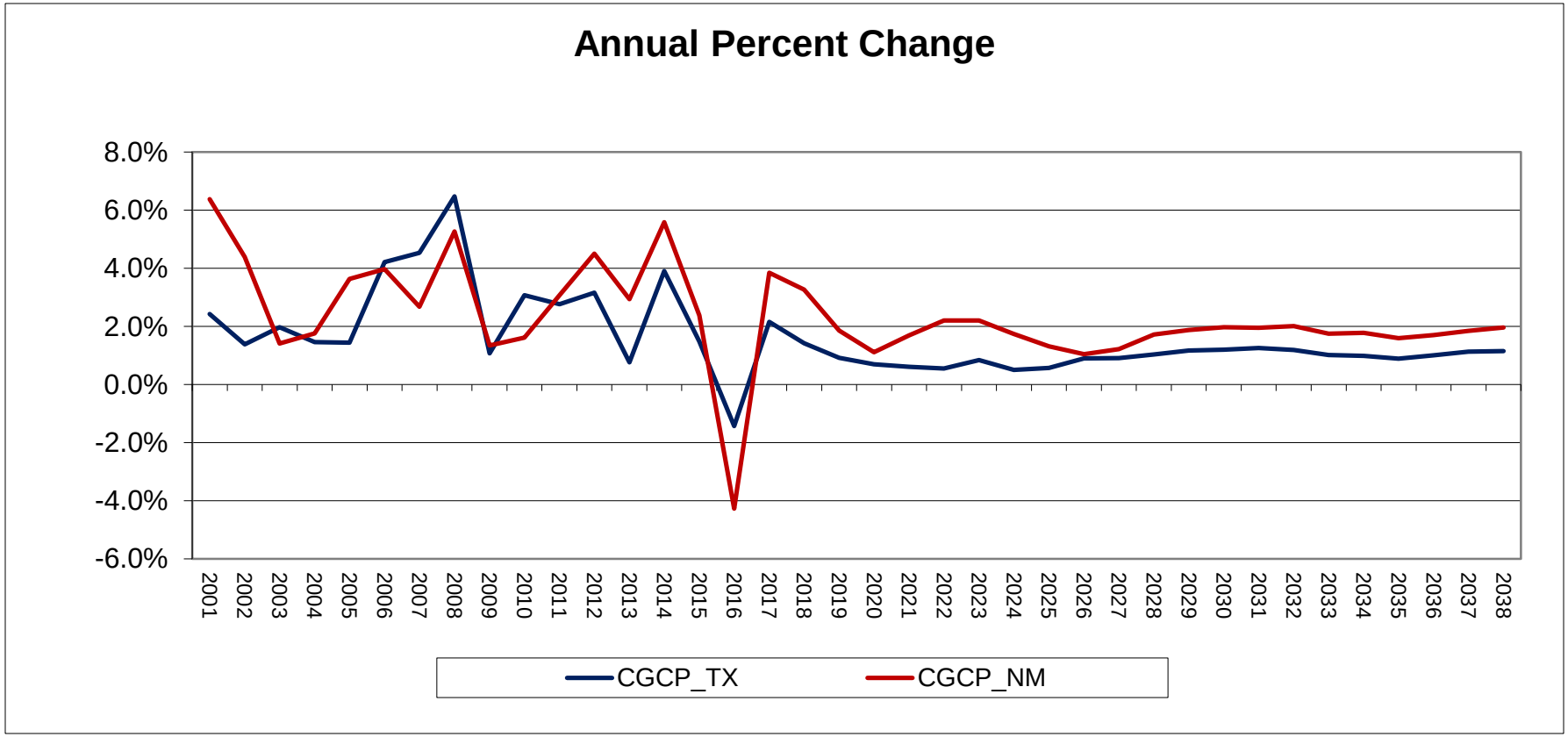
Other Methodologies

- Load factor analysis
- Historical trends
- Contractual requirements
- Exogenous adjustments for new load on the system

Economic and Demographic Assumptions

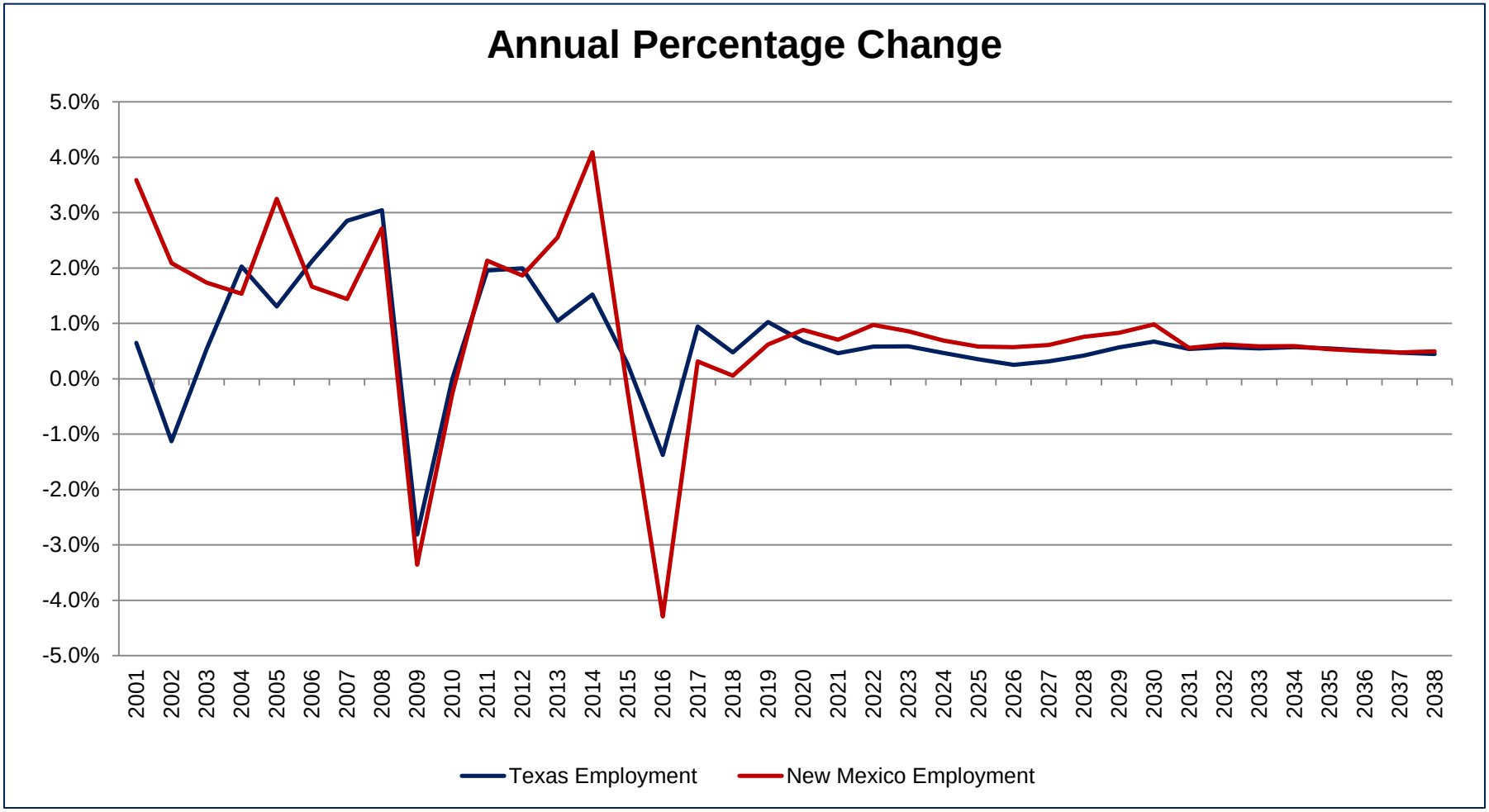
- Economic and demographic data obtained from IHS Global Insight, Inc. (both historical and forecast) for U.S., state and counties. County level data is aggregated to service territory.
- Economic and demographic variables used in modeling include service area employment, households, personal income, population, Gross County Product; Gross State Product (GSP); and U.S. Gross Domestic Product, oil and gas extraction index and oil prices.

Texas and New Mexico Service Area Gross County Product Growth



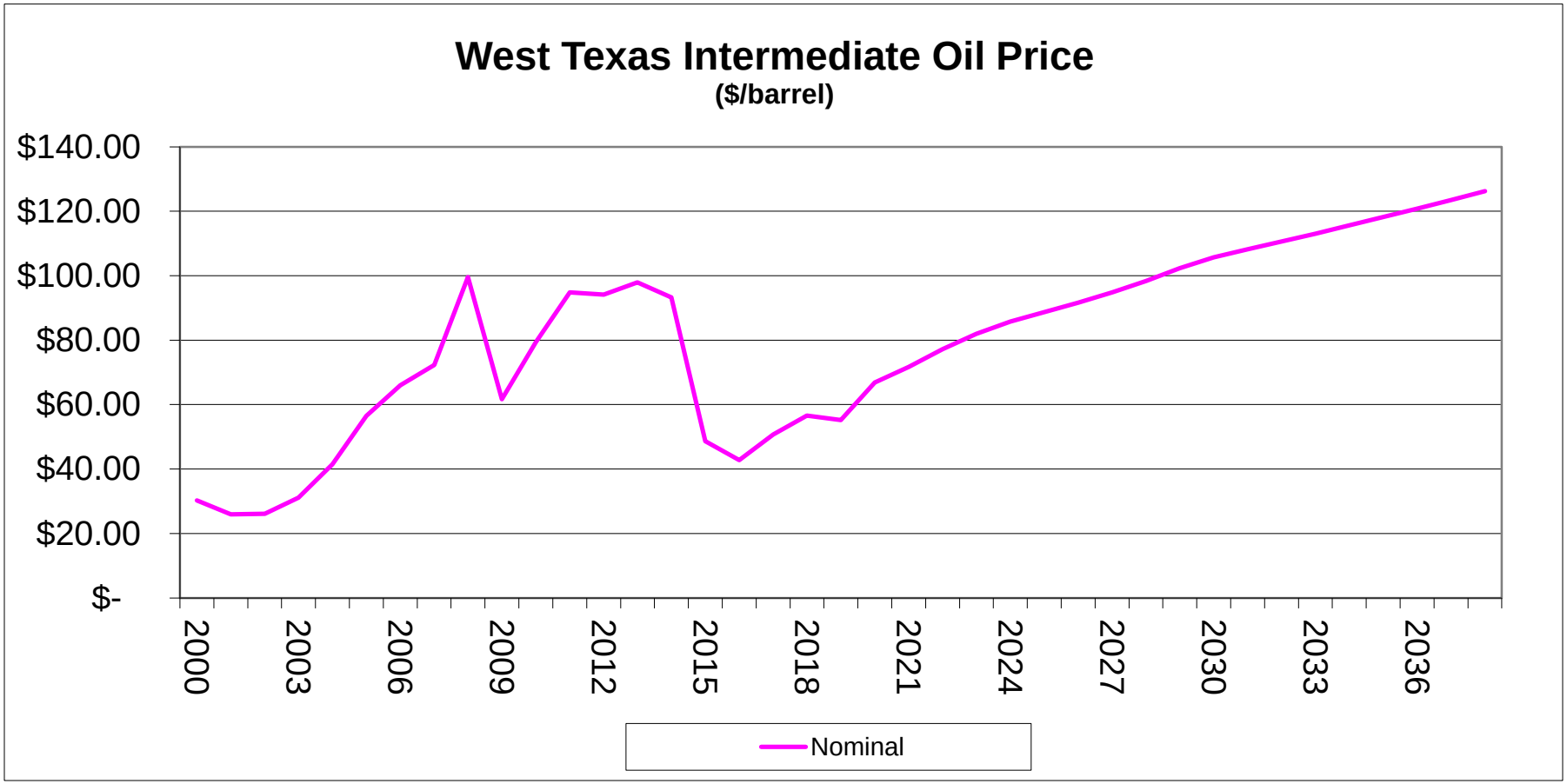
Source: IHS
Historical Data Ends: 2016

Texas and New Mexico Job Growth



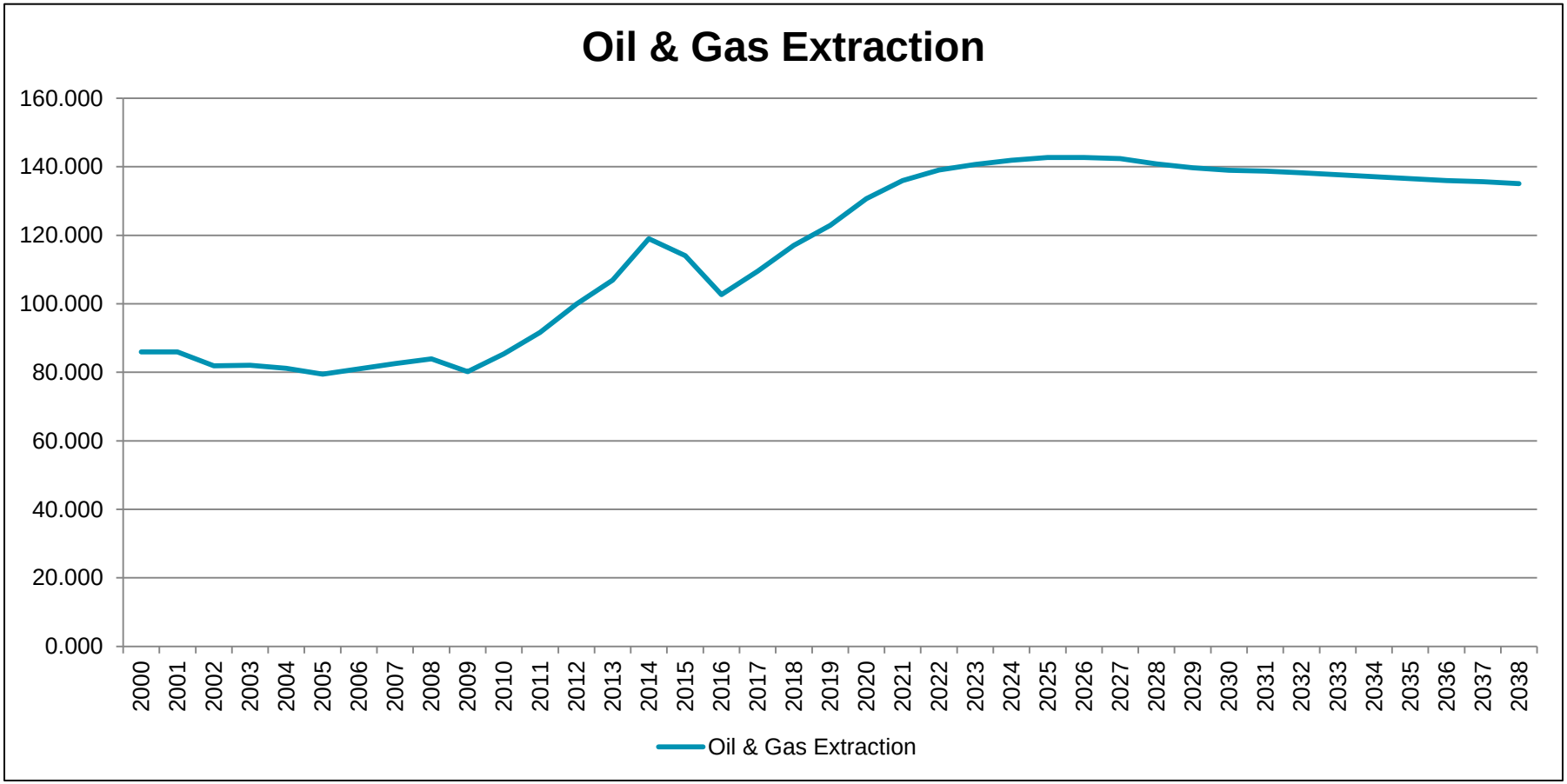
Source: IHS, Bureau of Labor Statistics
Historical Data Ends: 2016

Oil Price



Source: IHS
Historical Data Ends: December 2017

Oil and Gas Extraction Index

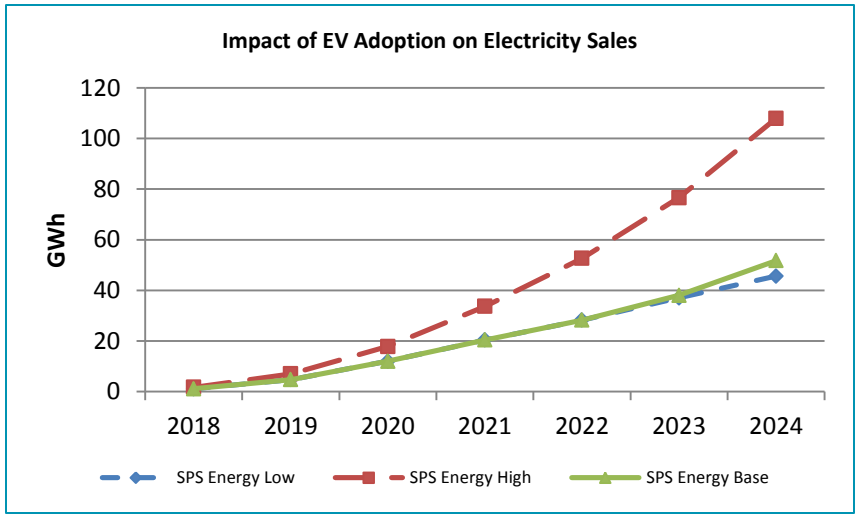


Source: IHS
Historical Data Ends: December 2017

Weather Assumptions

- Weather data collected from NOAA for Amarillo, Lubbock, and Roswell
- Forecast assumes normal weather defined as 30-year rolling average
- Includes temperature, Heating Degree Day (HDD), Cooling Degree Day (CDD), and precipitation
- Historical sales and peak demand are weather normalized for variance analysis

Residential Forecast
Exogenous Adjustment for Electric Vehicles*



Electric Vehicle Adoption Comparison

U.S. Adoption Rates	2016	2020	2025	2030
Xcel Energy	0.2%	0.7%	2.8%	9.6%
Bloomberg	0.2%	1.0%	3.0%	9.0%
GreenTech Media			3.8%	
Energy Information Agency			2.6%	
Navigant	0.2%	1.0%	2.8%	
Bank of America/Merrill Lynch (global adoption)	*0.2%*	*1.0%*	*10.0%*	*33.0%*

SPS Base Scenario			
Year	# Cars	% of cars	EV Forecast (GWh)
2018	1,793	0.30%	1
2019	2,898	0.40%	5
2020	5,016	0.70%	12
2021	6,641	1.00%	20
2022	8,485	1.20%	28
2023	11,004	1.60%	38
2024	14,586	2.10%	52
2025	14,586	2.10%	52
2026	14,586	2.10%	52
2027	14,586	2.10%	52
2028	14,586	2.10%	52
2029	14,586	2.10%	52
2030	14,586	2.10%	52
2031	14,586	2.10%	52
2032	14,586	2.10%	52
2033	14,586	2.10%	52
2034	14,586	2.10%	52
2035	14,586	2.10%	52

*Electric Vehicle assumptions provided by EV Strategy team (Risk Analytics, Strategy & Planning, and Customer Solutions)

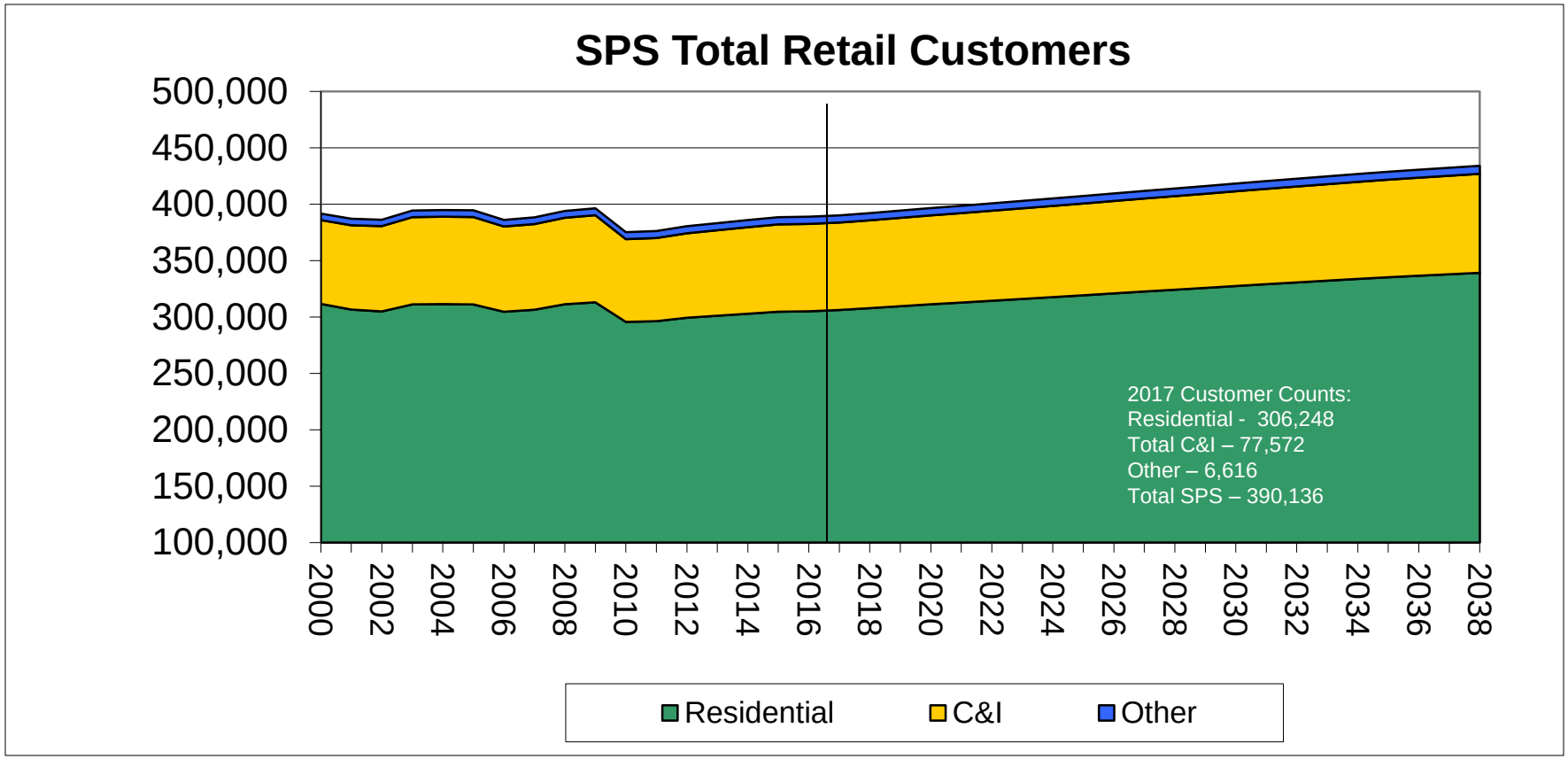
Distributed Generation

- The historical energy sales data used in SPS's forecast modeling process is net of behind-the-meter generation and demand response energy sales.
- The historical peak demand data used in the forecasting process has been adjusted to add back behind-the-meter generation and demand response to represent the total demand on the system.

Demand-Side Management

- Sales and peak demand forecasts are adjusted to account for expected incremental DSM savings
- DSM savings are based on legislated mandates
- Residential programs: CFLs, air source heat pumps, and cooling
- C&I programs: business lighting, cooling, motor replacement, and custom projects

Customer Forecast

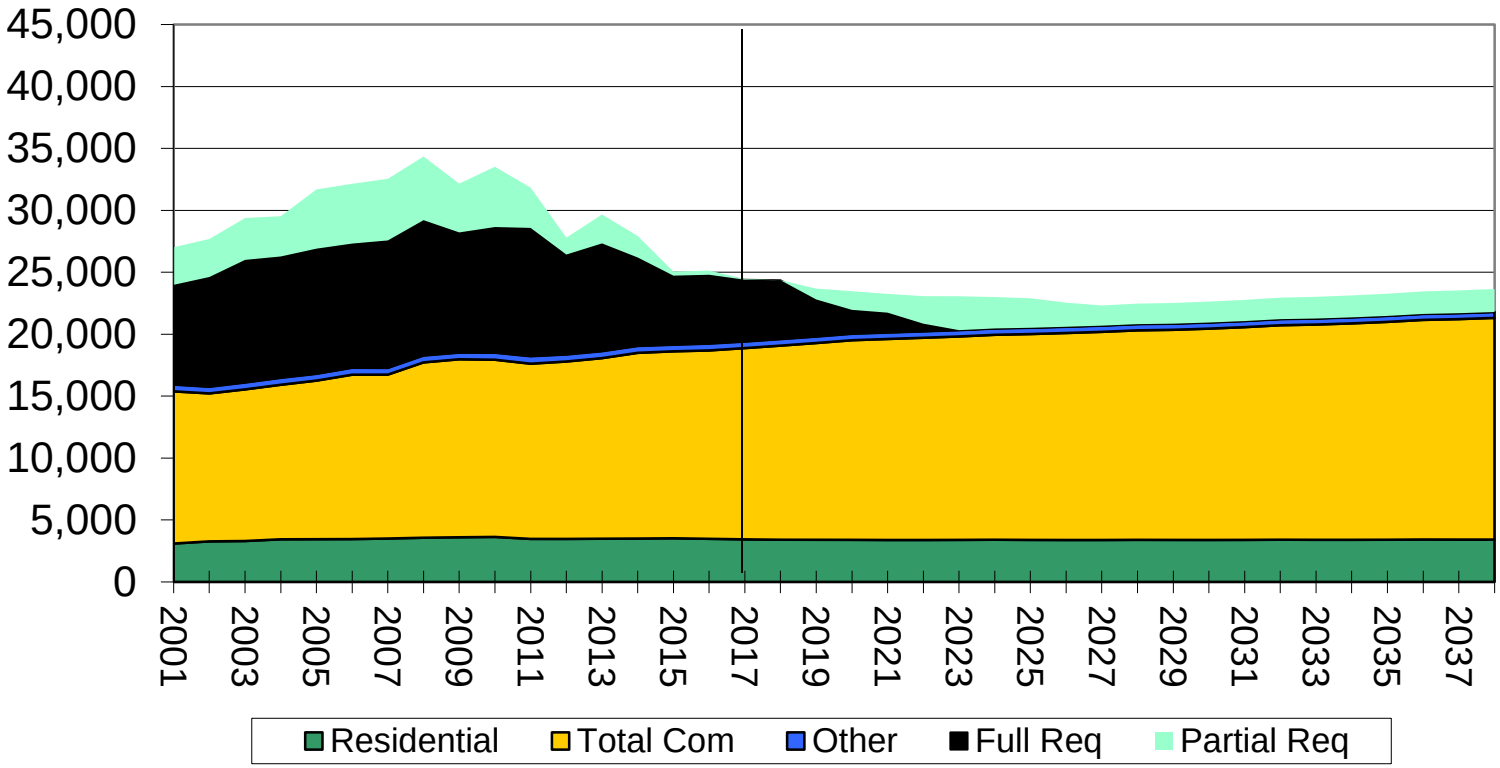


Retail Avg. Annual % Ch. 2011-2017 = 0.6% 2018–2038 = 0.5%

SPS Forecast Key Drivers

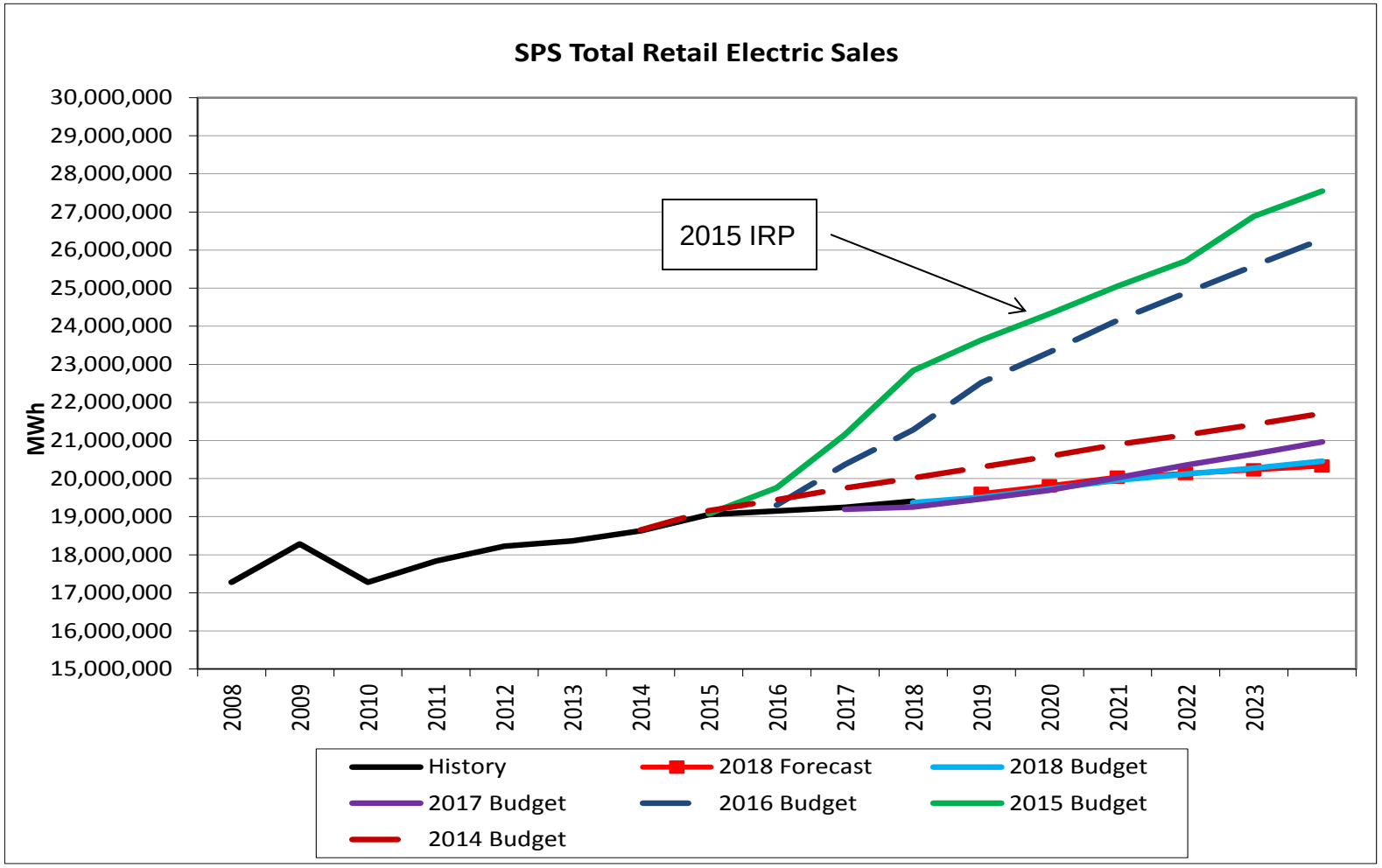
- Residential
  - Declining use per customer due to lighting standards
  - Forecast adjusted for impacts of EV's
- Small C/I
  - Declining use per customer in Texas
  - Increasing use per customer in New Mexico
- Large C/I
  - Sales growth flattens after 2020 based on Oil & Gas Extraction Index

Sales Forecast

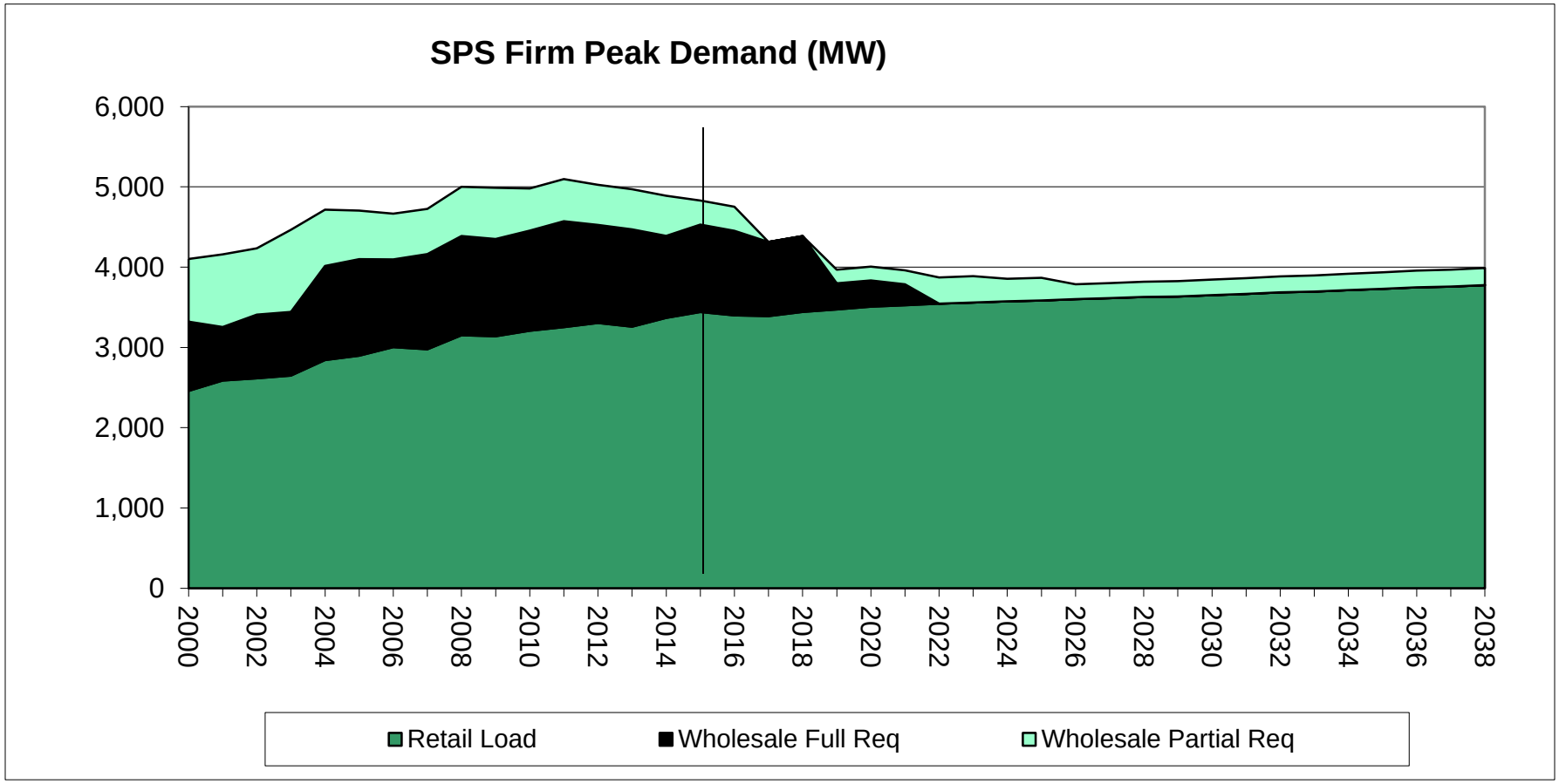


Retail Avg. Annual % Ch.	2011-2017 = 1.1%	2018–2038 = 0.5%
SPS Avg. Annual % Ch.	2011-2017 = -4.3%	2018–2038 = -0.1%

Sales Forecast Comparison

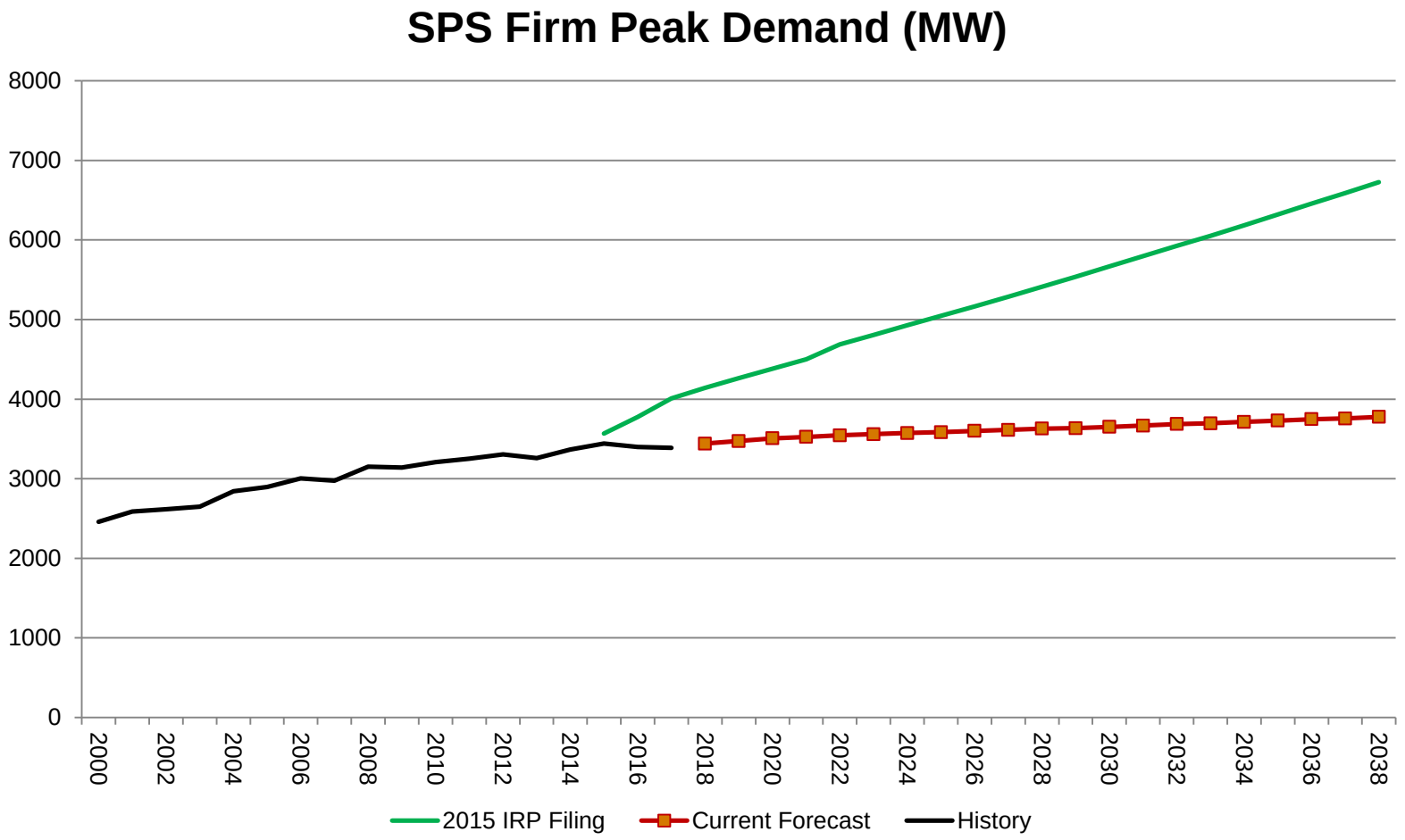


Peak Demand Forecast



Retail Avg. Annual % Ch.	2011-2017 = 0.7%	2018–2038 = 0.5%
SPS Avg. Annual % Ch.	2011-2017 = -2.7%	2015–2038 = -0.5%

Peak Forecast Comparison



Potential Load For SPS (in MW)

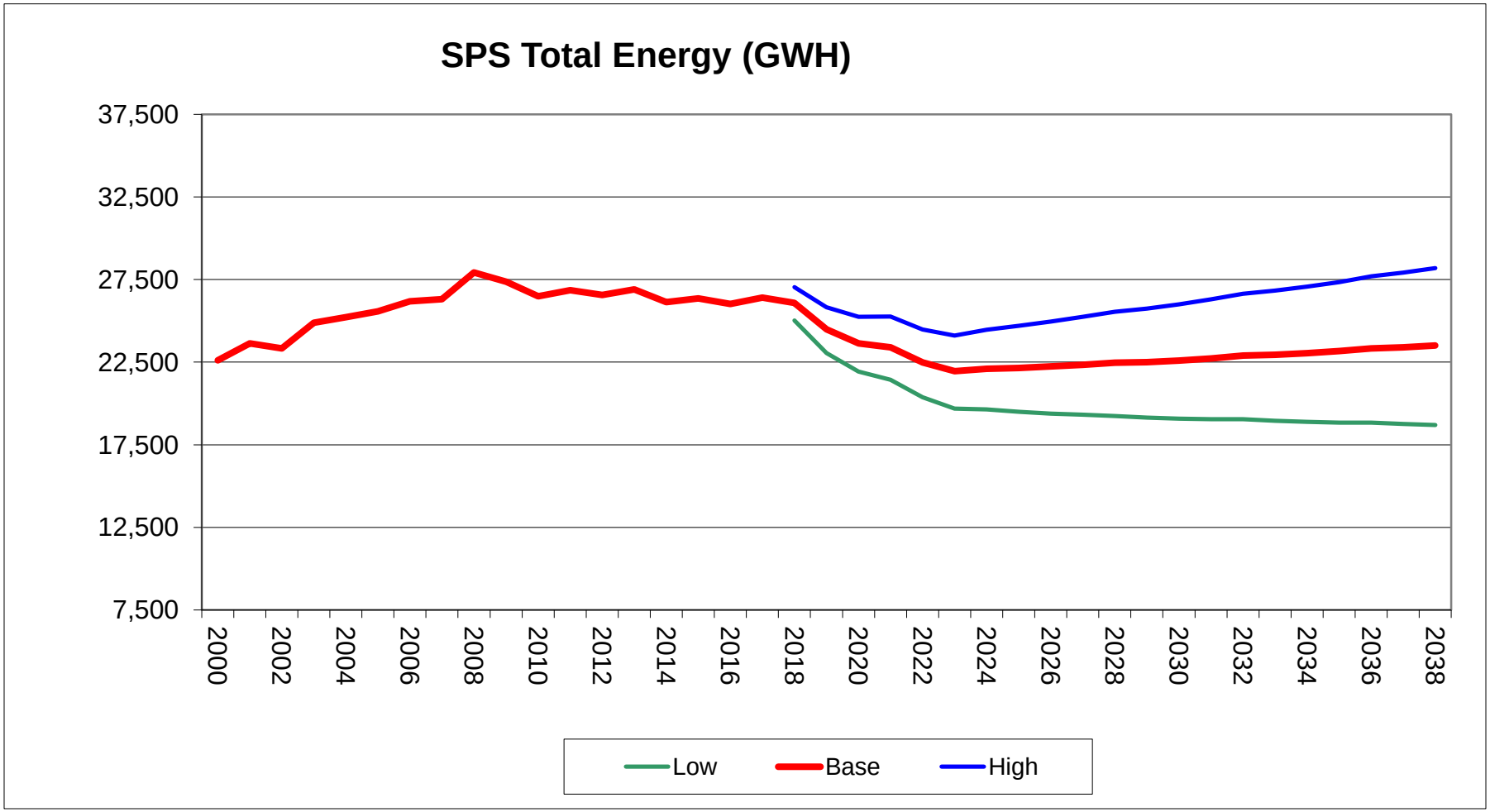
Year	Cust 1	Cust 2	Cust 3	Cust 5	Cust 4	Cust 6	Cust 7	Cust 8	Cust 9	Cust 11	Cust 10	Total
2018	5	9	6	8	0	0	0	0	0	0	0	28
2019	5	55	6	30	9	53	25	14	28	0	0	224
2020	5	55	12	52	9	140	46	20	28	25	0	391
2021	5	55	12	52	9	230	46	26	28	25	0	487
2022	5	55	12	52	9	273	46	32	28	25	0	536
2023	5	55	12	52	9	311	46	38	28	25	17	597
2024	5	55	12	52	9	311	46	38	28	25	17	597
2025	5	55	12	52	9	311	46	38	28	25	17	597
2026	5	55	12	52	9	311	46	38	28	25	17	597
2027	5	55	12	52	9	311	46	38	28	25	17	597
2028	5	55	12	52	9	311	46	38	28	25	17	597
2029	5	55	12	52	9	311	46	38	28	25	17	597
2030	5	55	12	52	9	311	46	38	28	25	17	597
2031	5	55	12	52	9	311	46	38	28	25	17	597
2032	5	55	12	52	9	311	46	38	28	25	17	597
2033	5	55	12	52	9	311	46	38	28	25	17	597
2034	5	55	12	52	9	311	46	38	28	25	17	597
2035	5	55	12	52	9	311	46	38	28	25	17	597
2036	5	55	12	52	9	311	46	38	28	25	17	597
2037	5	55	12	52	9	311	46	38	28	25	17	597
2038	5	55	12	52	9	311	46	38	28	25	17	597

- SPS Key Account Managers provide potential new load that has been identified through conversations with the customer.
- Timing and actual load risks.

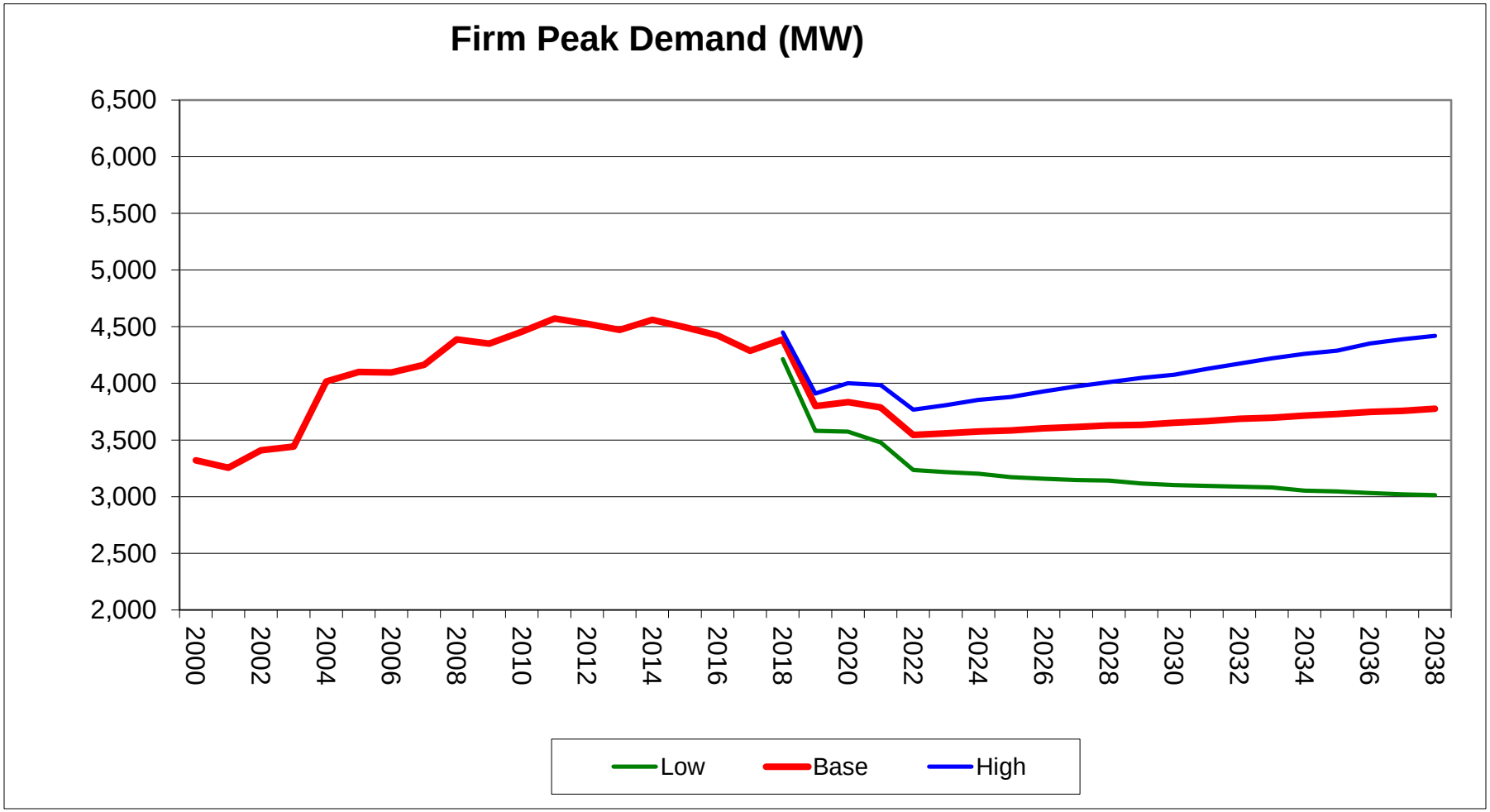
Forecast Scenarios

- Probability distributions are developed by conducting Monte Carlo simulations on the main drivers (e.g., weather and economics) of energy and peak demand forecasts
- Low-growth scenario is equivalent to the 15th percentile probability distribution
- High-growth scenario is equivalent to the 85th percentile probability distribution

Energy Forecast Scenarios

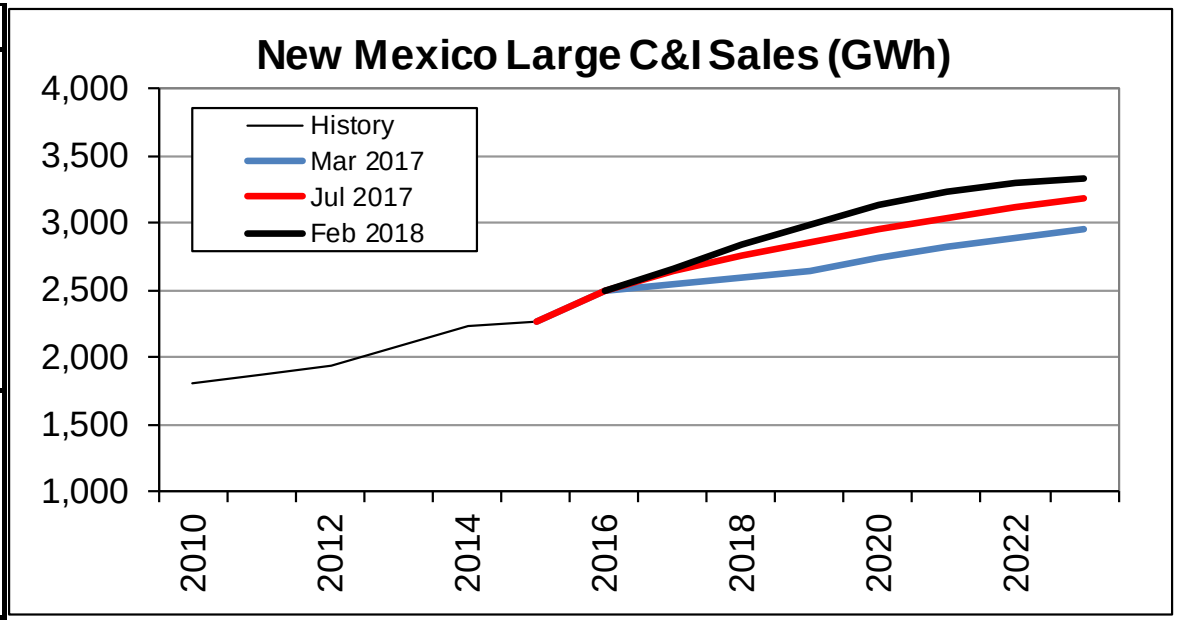


Peak Demand Forecast Scenarios



Appendix

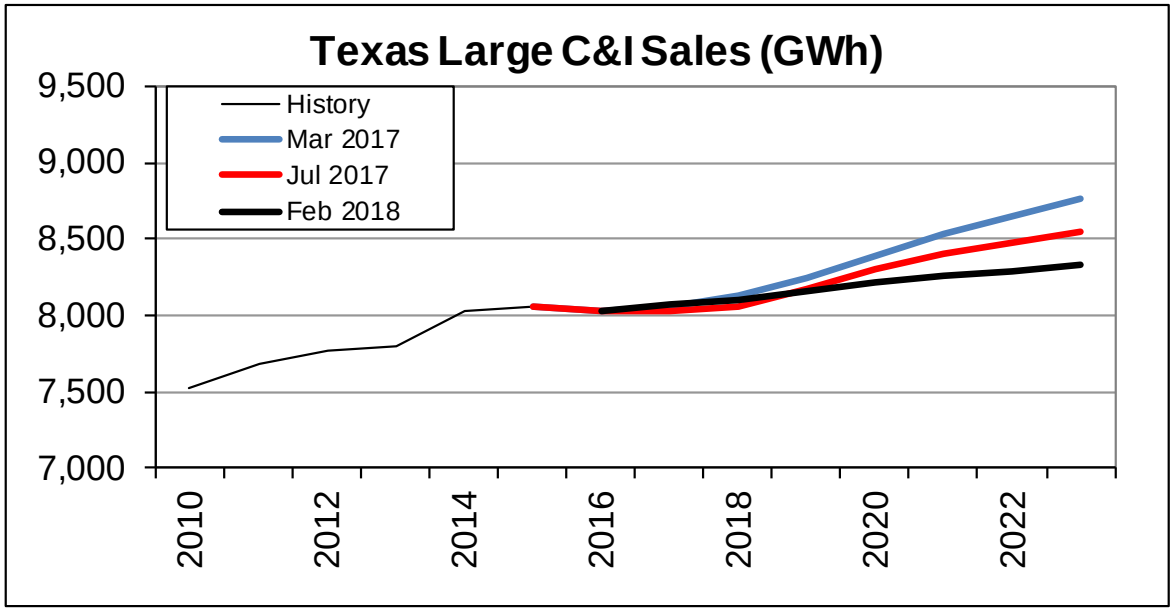
	2018-2023 Forecast (Feb 2018)		
	MWh	Change	%Change
2010	1,803,197	134,059	8.0%
2011	1,864,306	61,109	3.4%
2012	1,940,917	76,612	4.1%
2013	2,090,460	149,543	7.7%
2014	2,232,083	141,622	6.8%
2015	2,273,323	41,240	1.8%
2016	2,488,619	215,296	9.5%
2017	2,656,487	167,869	6.7%
2018	2,834,224	177,737	6.7%
2019	2,991,610	157,386	5.6%
2020	3,138,174	146,564	4.9%
2021	3,236,092	97,918	3.1%
2022	3,293,567	57,475	1.8%
2023	3,340,905	47,337	1.4%



Feb 2018 Forecast adjusted for customer which came online in January 2018

New Mexico Large C/I Sales Growth		
Year	Historical Growth	Historical Growth w/o New Loads
2013	7.7%	2.6%
2014	6.8%	2.7%
2015	1.8%	2.0%
2016	9.5%	3.4%
2017	6.7%	2.1%

	2018-2023 Forecast (Feb 2018)		
	MWh	Change	%Change
2010	7,521,317	210,548	2.9%
2011	7,681,654	160,337	2.1%
2012	7,761,988	80,334	1.0%
2013	7,799,867	37,878	0.5%
2014	8,029,491	229,624	2.9%
2015	8,060,610	31,119	0.4%
2016	8,028,725	-31,885	-0.4%
2017	8,067,144	38,419	0.5%
2018	8,105,092	37,948	0.5%
2019	8,155,717	50,625	0.6%
2020	8,218,413	62,696	0.8%
2021	8,253,211	34,798	0.4%
2022	8,292,393	39,182	0.5%
2023	8,332,214	39,820	0.5%

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Questions and Discussion

IRP Information

- Web Page:

https://www.xcelenergy.com/company/rates_and_regulations/resource_plans/sps_2019-2038_integrated_resource_plan

Note: After navigating to the webpage, in the upper left-hand corner of the page, make sure that "New Mexico" is selected. Click on Public Advisory Meeting then click on the link for the third meeting.

- Ashley Gibbons and Ben Elsey – Xcel Energy/SPS Contact
  - Address: 1800 Larimer Street, Ste, 1600 Denver CO 80202
  - Phone: Ashley (303) 571-2813 and Ben (303) 571-6705
  - Email: ashley.gibbons@xcelenergy.com
    ben.r.elsey@xcelenergy.com

Topics For Future Meetings

- Coal Supply
- Storage

Next Meeting

- **Date:**
  - **Thursday, May 31, 2018**
- **Time:**
  - **10:00am to 12:00pm (Mountain Time)**
- **Location:**
  - **Webinar meeting**


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