Louisiana Public Service Commission

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Executive Counsel

JOHNNYE E. SNELLGROVE, JR
Deputy Undersecretary

September 24, 2018

VIA HAND DELIVERY
Ms. Terri Bordelon
Louisiana Public Service Commission
Records and Recordings
602 N. Fifth St.
Galvez Bldg, 12th Fl.
Baton Rouge, LA 70802

Re: Docket No. I-34715 Southwestern Electric Power Company, ex parte.

Dear Ms. Bordelon:

Enclosed please find a *Report of Stakeholder Meeting and Notice of Revised IRP Event Dates* for the above referenced docket.

If you have any questions regarding this matter, please do not hesitate to contact me.

Sincerely,

Melissa Watson

Melissa Watson
Deputy General Counsel

MW/kst
Encl.

cc: Service List

BEFORE THE
LOUISIANA PUBLIC SERVICE COMMISSION

DOCKET NO. I-34715

SOUTHWESTERN ELECTRIC POWER COMPANY, EX PARTE

In re: Request to Initiate the Integrated Resource Plan process pursuant to the General Order dated April 20, 2012.

REPORT OF STAKEHOLDER MEETING AND NOTICE OF REVISED IRP EVENT DATES

In accordance with the notice filed June 15, 2018, by Southwestern Electric Power Company ("SWEPCO"), a Stakeholder Meeting was held July 25, 2018, at the offices of the Louisiana Public Service Commission ("LPSC" or "the Commission") in the Natchez Room, Galvez Building 1st Floor, 602 North Fifth Street, Baton Rouge, LA 70802. A Stakeholder Meeting Agenda provided by SWEPCO is attached as Attachment 1. A record of those attending the conference is attached as Attachment 2. The slide presentation that SWEPCO introduced at the meeting is attached as Attachment 3.

Ms. Lynn Ferry-Nelson of SWEPCO opened the meeting with a welcome and introductions by those in attendance. After the opening remarks and introductions, Ms. Melissa Watson representing Commission Staff provided some brief remarks regarding the meeting and housekeeping matters.

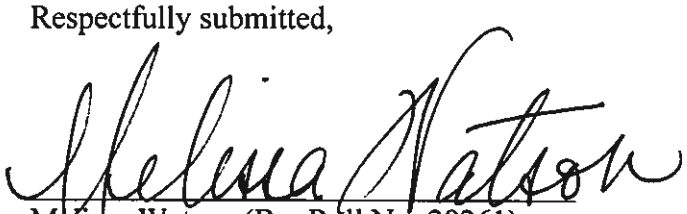
Mr. John Torpey led a discussion of SWEPCO's IRP, including providing a slide presentation that addressed the previously filed data assumptions underlying the IRP reference scenarios. Mr. Torpey also provided a detailed description of the Company's existing resources and a schedule for the IRP process going forward. Mr. Mark Harris continued the presentation by

analyzing the economic forecast in relation to the IRP. Lastly, Mr. Scott Fisher spoke about potential future resources. Attendees were invited to ask questions throughout the presentation and at its conclusion.

Those in attendance were reminded that all comments regarding SWEPCO's January 30, 2018 data assumption filing are due September 25, 2018, in accordance with the scheduled Event Dates. The Cleco Notice of Extended IRP Event Dates filed November 17, 2017 listed the months and years for the Schedule of Events as contemplated by the IRP General Order. A revised Notice of IRP Event Dates is attached as Attachment 4, which provides for dates certain in those months which will apply going forward. It schedules the events on the closest business day to the 5th of month for each event.

Baton Rouge, Louisiana, this 24th day of September 2018.

Respectfully submitted,



Melissa Watson (Bar Roll No. 28261)
Deputy General Counsel
Louisiana Public Service Commission
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602 North Fifth Street, Galvez Bldg., 12th Fl.
Baton Rouge, Louisiana 70802
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melissa.watson@la.gov

ATTACHMENT 1

SOUTHWESTERN ELECTRIC POWER COMPANY
An AEP Company
BOUNDLESS ENERGY

SWEPCO Integrated Resource Planning

Stakeholders' Meeting

July 25, 2018
10:00 AM – 2:00 PM

602 North Fifth Street Galvez Building, 1st Floor
Natchez Room, Baton Rouge, Louisiana 70821

AGENDA		
10:00 AM	**Opening Remarks** *Welcome and Introductions*	**Lynn Ferry-Nelson** - *Director, Regulatory Services*
10:05 AM	**SWEPCO's Resource Planning Process** ➢ *Existing Resources* ➢ *Going-In Position* ➢ *IRP Process* ➢ *Planning Assumptions* ○ *Commodity Forecast* ○ *Load Forecast* ○ *Incremental Resources Options*	**John Torpey** - *Managing Director, Resource Planning* **Scott Fisher** - *Manager, Resource Planning* **Mark Harris** – *Economic Forecast Staff Analyst*
12:00 – 1:00 PM	**Lunch**	
1:00 PM	**SWEPCO's Stakeholder Process** ➢ *Stakeholder Process* ➢ *Next Steps*	**John Torpey** - *Managing Director, Resource Planning*
2:00 PM	**Closing Remarks / Adjourn**	**Lynn Ferry-Nelson** - *Director, Regulatory Services*

ATTACHMENT
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LOUISIANA PUBLIC SERVICE COMMISSION

SIGN-IN SHEET FOR COUNSEL AND PARTY REPRESENTATIVES

DOCKET #: I-34715 Southwestern Electric Power Company, ex parte.
Request to Initiate the Integrated Resource Plan process pursuant to the General Order dated April 20, 2012.
DATE: 07/25/2018

PLEASE PRINT CLEARLY

NAME	PARTY ON WHOSE BEHALF YOU ARE APPEARING	ADDRESS	PHONE # (INCLUDING AREA CODE)	EMAIL ADDRESS/FAX # (INCLUDING AREA CODE)
John Torpey	SWEPCO	1 Riverside Plaza Columbus, Olf 43215-	614 716-2909	jftorpey@aep.com
Scott Fisher	" "	" "	614 716 4517	sfisher@aep.com
MARK HARRIS	" "	2 WEST 2ND TULSA, OK 74103	918 599 2174	mharris@aep.com
Bobby Gillam	SWEPCO	400 Travis St Suite 700 Shreveport, LA 7119	318 221 4196	Bgillam@[redacted]wcglawfirm.com
Jonathan McCartney	SWEPCO	" "	" "	jmccartney@wcglawfirm.com
Lynn Ferry-Nelson	SWEPCO	" "	318. 673 3730	lmferry-nelson@aep.com
Emile Cordaro	Swepco	"	318-673 3453	EBCordaro@AEP.com

LOUISIANA PUBLIC SERVICE COMMISSION

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NAME	PARTY ON WHOSE BEHALF YOU ARE APPEARING	ADDRESS	PHONE # (INCLUDING AREA CODE)	EMAIL ADDRESS/FAX # (INCLUDING AREA CODE)
Eric Fletcher	Cleco	2030 Donahue Ferry Rd Pineville, LA 71360	318-484-7900	eric.fletcher@cleco.com
Karen Haymon	EP2 Consulting	PO Box 13640 Alexandria, LA	318 290 7606	Karen@ep2consulting.co
Royal Alexandre	LPSC Staff	PO Box 1837	Baton Rouge LA	Royal.Alexandre@lpsc.la.gov
Patrick Wissing	SWEPCO	400 Travis St. Shreveport, LA 71101	318-221-4196	pwissing@wcglawfirm.com
Forest Bradley Wright	SACE	4532 Bancroft Dr NOLA 70122	504 208-7597	forest@cleanenergy.org
Jessica Hendricks	Alliance	4505 S. Claiborne Nola		Jessica@allenergy.org

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Jaclyn Penzo	LPSC	Galvez, Floor 12	(225) 342-9888	jaclyn.penzo@la.gov
Paul Chastant	LPSC	201 St. Charles	(504)5447730	paul@sisung.com
Lane Sisung	LPSC	201 St. Charles	(504)5447724	lane@sisung.com
Simon Mahan	SREA	209 Aspen Trail Lafayette, LA 70507	337-303-5723	smahan@southernreed.org
Melissa Watson	LPSC	602 N 5th 12th Fl. Galvez	225-342-9888	melissa.watson@la.gov
Josh Smith (phone)	Sierra Club			

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NAME	PARTY ON WHOSE BEHALF YOU ARE APPEARING	ADDRESS	PHONE # (INCLUDING AREA CODE)	EMAIL ADDRESS/FAX # (INCLUDING AREA CODE)
Adrian Ortlieb	Ironwood Land Partners	128 Demanade Blvd, Ste 203 Lafayette, LA 70503	337-412-9199	adrian.ortlieb@hosresources.com
Jimmy Supple	"	"	337-296-8032	jsupple@hosresources.com
Scott Williams	Cypress Creek Renewables, LLC	Santa Monica, CA	925 323 2120	~~Scottlia~~ Scott.williams@ccrenew.
Bo Stuples	Greene			

ATTACHMENT

3




SOUTHWESTERN ELECTRIC POWER COMPANY

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2019 SWEPCO Integrated Resource Plan

Description of Studies

&

Study Assumptions

July 25, 2018




SOUTHWESTERN ELECTRIC POWER COMPANY
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Contents

- Introduction to SWEPCO
- SWEPCO Resource Planning
- IRP Process and Studies
  - Identifying resource options
  - Create and Analyze optimized resource portfolios
- Key Planning Assumptions
- Stakeholder Input Process
- Next Steps




SOUTHWESTERN ELECTRIC POWER COMPANY
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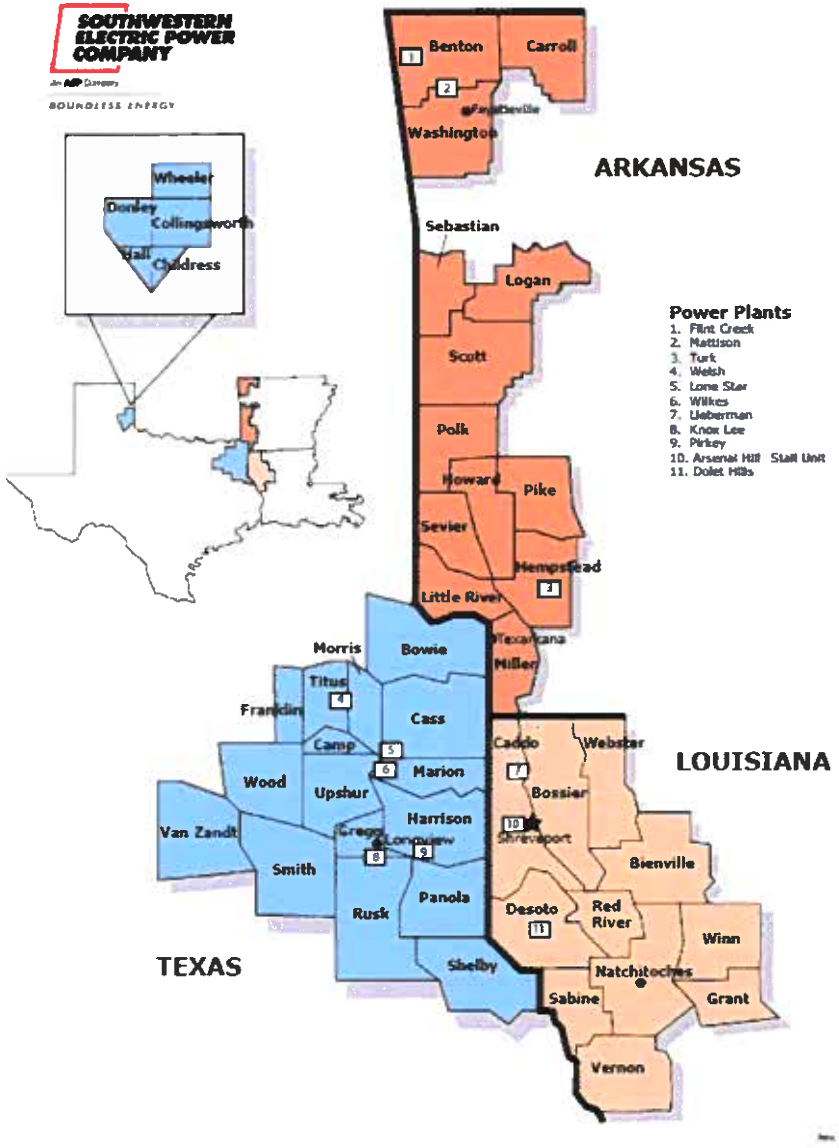
About Southwestern Electric Power: Integrated Resource Planning

- Southwestern Electric Power Company (SWEPCO) is headquartered in Shreveport, LA
- More than 535,000 customers in Louisiana, Arkansas and Texas.
  - 231,000 customers - LA
  - 185,000 customers - TX
  - 119,000 customers - AR
- SWEPCO also serves wholesale customers which represent about 12% of its load; additionally SWEPCO provides scheduling service for ~500MW
- SWEPCO participates in the Southwest Power Pool Regional Transmission Organization which establishes system reliability criteria

SWEPCO is a unit of American Electric Power (NYSE: AEP), which is one of the largest electric utilities in the United States, delivering electricity to more than 5 million customers in 11 states.



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2015 IRP's Five Year Action Plan Status

SWEPCO's Five Year Action Plan from the 2015 IRP – (Page 1 of 4)

1. Begin/Continue the planning and regulatory actions necessary to implement economic energy efficiency programs
   a. Arkansas - Energy efficiency programs have been in place in Arkansas since 2007. For program year 2014, SWEPCO achieved 141% of its goal. SWEPCO has steadily grown its portfolio in Arkansas to a proposed budget of $10.3 million for 2016 with a proposed savings goal of 23,957,863 kWh. SWEPCO will file a new 3 year portfolio plan June 1, 2016.

Status: ***SWEPCO's Arkansas portfolio continued to exceed its energy savings goals through 2017. The next three year portfolio is scheduled to be filed in March 2019.***

   b. Louisiana - The Quick Start Phase of energy efficiency programs began in Louisiana November 1, 2014 and is scheduled to continue through June 30, 2017. SWEPCO is in the process of completing Program Year (PY) which will end October 31, 2015 with results pending. As of mid-September, we are currently at 104% of PY1 kWh goal with approximately 10% of incentive budget remaining. (PY 1 and PY2 budgets are $1.9 million each, with PY3 budget set at $1.6 million.

Status: ***SWEPCO completed the initial Quick Start Phase (PY1-PY3) of Energy Efficiency in Louisiana. Although the EE rule does not require specific savings targets, SWEPCO did meet proposed targets all three years. The LPSC elected to extend the Quick Start Phase for one additional year pending the finalization of long-term rules in Phase II. SWEPCO is on track to exceed proposed targets for PY4. Through June, SWEPCO's EE portfolio has achieved 58% (5,369,712 kWh) of its proposed kWh target (9,184,027 kWh).***




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SWEPCO's Five Year Action Plan from the 2015 IRP: (Page 2 of 4) *Continued*

1. Begin/Continue the planning and regulatory actions necessary to implement economic energy efficiency programs
   c. Texas – Energy efficiency programs have been in place in Texas since 2000. For Program Year 2014, SWEPCO achieved 225% of its demand reduction goal and 178% of its energy goal. The proposed savings goals for Program Year 2015 are 9,282 kW and 11,815,878 kWh to be achieved with a budget of $3,452,748. A two-year plan is filed on May 1 of each year. This plan can be altered from the previous filing without prior commission approval.

Status: ***Energy Efficiency programs in Texas continue to exceed regulatory goals. Peak demand reduction goal for Texas has remained the same (5.6 MW) since 2008. Current 2018 budget is $4.2 million.***

   d. The Preferred Plan illustrates that incremental Energy Efficiency and Volt VAR Optimization are economical resource options. The measures selected and the amounts of VVO and EE selected will be reviewed with the state Energy Efficiency Managers for future inclusion into the state specific EE recommended plans/programs.

Status: ***As stated above SWEPCO continues to pursue economic EE in all jurisdictions. SWEPCO continues to monitor VVO technology for economic applications.***




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SWEPCO's Five Year Action Plan from the 2015 IRP: (Page 3 of 4) *Continued*

2. Conduct an RFP(s) to explore potential near-term, tax-advantaged opportunities to add up to 200 MW wind and 50 MW of solar energy (via REPAs).
   a. Assuming the Federal Production Tax Credits/Investment Tax Credits for wind/solar are not extended (*i.e.*, will expire by the end of 2016), an expedited review and approval process will be required to add PTC/ITC eligible wind/solar energy to SWEPCO's portfolio. Therefore SWEPCO will require assurances, by the end of October 2015, that the regulatory review and approval process could be completed by approximately January 2016.
   b. If such assurances can be received by SWEPCO, develop and issue RFPs for PTC/ITC eligible wind/solar projects (Nov 2015).
   c. Evaluates RFP responses including associated transmission service and select winning projects (Dec 2015).
   d. Seek and obtain regulatory approval (Jan 2016) for Dec 2016 commercial operation date.
   e. Note: The ultimate execution and contract award of any additional renewable REPAs would be conditioned upon the prior receipt of such regulatory approvals.

Status: ***SWEPCO is currently pursuing the approval of the Wind Catcher project. If approved SWEPCO will likely not evaluate or consider additional renewables in the immediate future.***




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2015 IRP's Five Year Action Plan Status

SWEPCO's Five Year Action Plan from the 2015 IRP: (Page 4 of 4) *Continued*

3. Continue to evaluate gas-steam unit ongoing operating and maintenance costs, in addition to equipment liability issues to determine most likely candidates for near term retirements.
   a. This is an ongoing activity based on observed unit performance and economic viability.

Status: ***Retirements over the next 5 years include: Knox Lee Units 2, 3 & 4, 127MW; Lieberman Units 2 & 3, 134MW and Lone Star 50MW***

4. Complete solid fuel plant MATS and Regional Haze-required retrofit projects already underway.
   a. Pirkey Station: Install Calcium Bromide injection system (Project Complete)
   b. Welsh Units 1& 3: Complete Activated Carbon Injection (ACI) , Fabric Filter Baghouse, and Chimney installations (2016)
   c. Flint Creek: Complete Dry Fluidized Gas Desulfurization and ACI installations (2016)

Status: ***The above projects are complete.***

5. Continue to evaluate the Final EPA Clean Power Plan guidelines and provide technical input to state regulatory bodies as to cost effective compliance options: ongoing activity.

Status: ***The Clean Power Plan has been proposed to be repealed and the EPA is working on a new rule to manage Carbon, the Company continues to monitor its status.***




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Objectives for the SWEPCO IRP Stakeholder Process

Stakeholder input is an important part of the IRP process. SWEPCO identified three main objectives for stakeholder engagement:

- **Inform:** Increase stakeholders' understanding of the IRP process, key assumptions used in the IRP, and challenges that SWEPCO faces.
- **Listen:** Understand our stakeholders' resource planning concerns and objectives.
- **Consider:** Provide a forum for productive stakeholder feedback on specific topics at key points in the IRP process to inform SWEPCO's decision-making.

Two stakeholder workshops will be held during the planning process. The tentative timeline is shown below.




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About Southwestern Electric Power: Current Resources

UNIT SUMMARY

Plant	Unit	Fuel Type	C.O.D. [1]	Rating MW [2]
Arsenal Hill	5	Gas Steam	1960	110
Knox Lee	2	Gas Steam	1950	30
	3		1952	26
	5		1974	342
Lieberman	2	Gas Steam	1949	25
	3		1957	109
	4		1959	108
Lonestar	1	Gas Steam	1954	50
Mattison	1	Gas (CT)	2007	71
	2		2007	71
	3		2007	71
	4		2007	71
Wilkes	1	Gas Steam	1964	164
	2		1970	360
	3		1971	353
J.L Stall	6	Gas (CC)	2010	511
Dolet Hills	1	Lignite	1986	257
Flint Creek	1	Coal	1978	258
Pirkey	1	Lignite	1985	580
Turk	1	Coal	2012	477
Welsh	1	Coal	1977	525
	3		1982	528
			Total =	5,097

Notes:
(1) Commercial operation date.
(2) Peak net dependable capability (Summer) as of filing.

Renewable Resources

- Pending Wind Catcher Project
  - 1,400MW Nameplate Wind & initially 67MW for Capacity Planning purposes, forecasted to be 200MW based on forecasted performance
- Existing Wind
  - Canadian Hills (201MW) Canadian County, OK
  - Majestic/High Majestic Wind II (159MW) Carson & Potter Counties, TX
  - Flat Ridge Wind Energy (109MW) Wichita, KS
  - Total SPP Capacity Value = 99MW

Demand Side Resources

- Demand Response - 46MW
- Energy Efficiency – 5MW

Other Resource (Purchases with Reserves) 174MW




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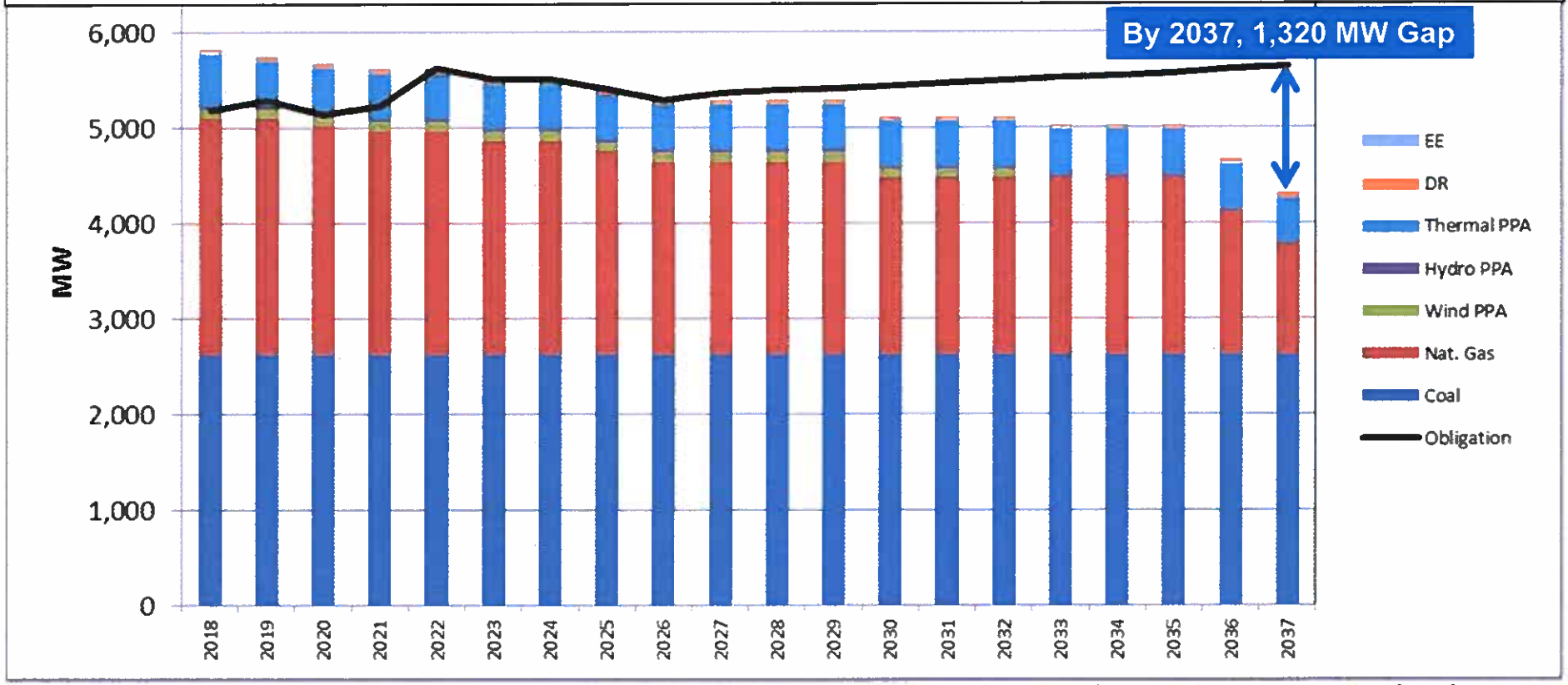
SWEPCO Resource Needs Assessment

SWEPCO Going-In Capacity Position

*DSM shown as a resource, not a load reduction and Renewables capacity at SPP rating, not nameplate



- From a Capacity planning perspective SWEPCO has adequate levels of capacity to meet its load requirements through 2026
- The IRP process will identify specific resource types to potentially supplement "Other Wholesale Purchases", that may include: Energy Efficiency, Demand Response, Wind, Solar and peaking or base load fossil resources

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Potential Portfolios for Consideration

- Based on current assumptions, SWEPCO's modeling will focus on:
  - Reducing overall ***Energy*** cost through:
    - Focused DSM/EE deployment opportunities
    - Investigating continued Investment in Solar and Wind Resources
    - Investigating the use/value of Energy Storage Resources
    - Other opportunities for Natural Gas Combined Cycle, Simple Cycle or Reciprocating Engines




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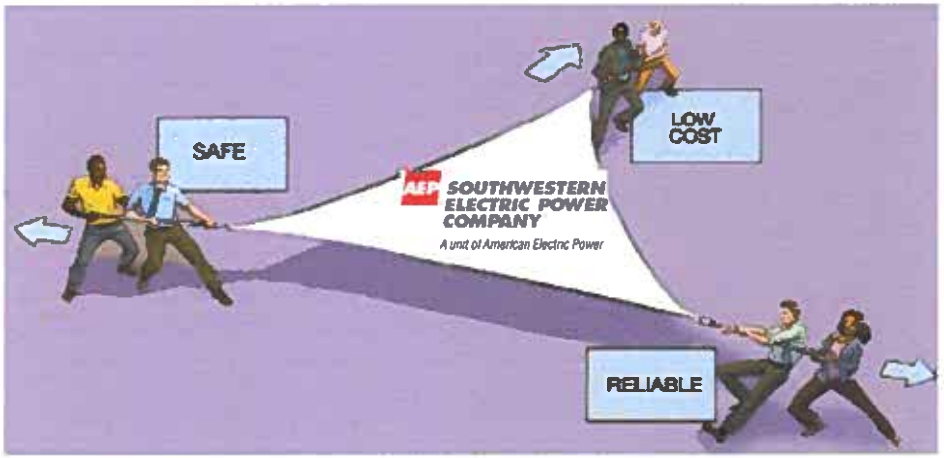
The Integrated Resource Planning Process

- Resource planning is a complex effort that must balance the needs of a variety of constituents:
  - Customers
  - Regulators,
  - Shareholders, and
  - Other Stakeholders…
- …while ensuring that electricity is provided in a safe, reliable, and efficient manner at reasonable rates.
- The process involves looking at "big-picture" trends that affect energy markets, developing and using forecasting and analysis models, and selecting approaches that will meet customer needs in the safest, most reliable and economical way given the uncertainties about the future.

There are many priorities that compete for resources as SWEPCO works toward its objective to provide safe, reliable, clean power at rates that are reasonable.



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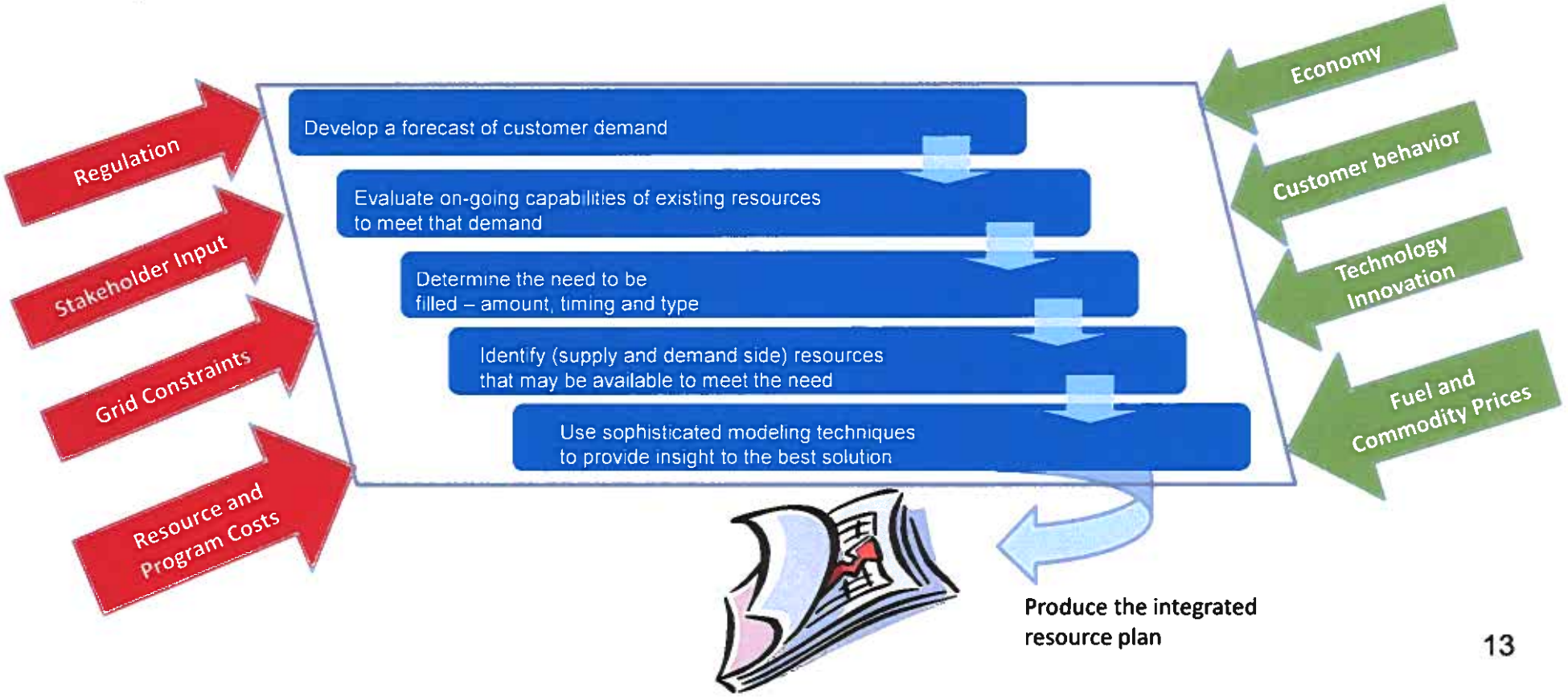
The Integrated Resource Plan Development - Study Description

Creating an Integrated Resource Plan (IRP) involves four basic and interconnected steps:

- **Step 1:** Gathering data, developing input assumptions and creating scenarios
- **Step 2:** Optimized Resource Portfolio Development
- **Step 3**: Analyzing optimal resource portfolios
- **Step 4:** IRP Report Development



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Step 1: Gathering data, developing input assumptions and creating scenarios

This phase of the IRP development involves:

- ❑ SWEPCO works with its internal experts to develop forecasts for commodities and fuel prices. These are the core drivers in the integrated resource plan.
- ❑ SWEPCO meets with interested stakeholders to solicit feedback on IRP input assumptions and scenario and sensitivity considerations.
- ❑ Load forecasts are developed for the next thirty years. These forecasts take into consideration elements such as projected economic growth and energy efficiency effectiveness. They help the resource planners to anticipate the level of energy and capacity needed during the 20-year timeframe (2019-2038) of the IRP.
- ❑ Cost projections are developed for new construction, environmental compliance, and other key input assumptions.
- ❑ Potential resource options are screened to eliminate those that have technical and commercial availability limitations or are not feasible in SWEPCO's service territory.
- ❑ Assumptions on operational characteristics of existing resources are revisited, including their anticipated remaining useful life.
- ❑ Scenarios are developed to reflect possible futures. These scenarios will be used to guide analysis of different resource portfolios.




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Step 1 (cont'd) - Scenario Development, Cost and Performance Assumptions

IRP development involves the creation of a comprehensive set of economic scenarios to fully evaluate potential resource portfolios.

- SWEPCO has developed four economic scenarios which cover a wide range of possible future states.
  - Base Commodity Pricing (including CO_2 emissions pricing)
  - Lower Band Commodity Pricing
  - Higher Band Commodity Pricing
  - No Carbon (assumes cost of CO_2 emissions is $0/metric-ton)

- Economic Scenarios are fully integrated

- Transmission and/or Generating Resource locational cost/benefits are not normally considered in the IRP Process because resource options are typically not location specific
  - SPP is responsible for overall RTO reliability
  - Specific resource options that are locational specific work with SPP to determine its delivery point feasibility, SPP studies these request and identifies issues and potential transmission system remediation cost for each Interconnection request
  - The quantification and analysis of resources options inclusive of Transmission related costs/benefits is an analysis that is completed outside of the IRP process, due to the unknown nature of the potential Transmission costs/benefits at the time of the IRP




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Step 2: Portfolio Development

This phase of the IRP development involves:

- Screening models are used that incorporate the capital & operating cost of each resource option to identify cost-effective resource options that will be evaluated in more detail over the range of scenarios & sensitivities using Plexos LT resource optimization model
- Optimized resource portfolios are created by LT Plan using the "Gap" between requirements & current resources
- Stakeholders can also suggest portfolios for consideration
- Sensitivities are performed to determine how the cost-effectiveness of the optimized resource portfolios change if certain key assumptions are varied. Such sensitivities may include: fuel prices, load forecast, construction/capital costs, and carbon and environmental policies. Stakeholders will be asked for feedback on which sensitivities should be performed.




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Step 3: Analyzing Portfolios

This phase of the IRP development involves:

- ❑ Optimized resource portfolios are created using Plexos
- ❑ The preferred resource portfolio is selected by determining which resource portfolio and/or combination of resource portfolios best balances cost effectiveness, reliability and portfolio risk and uncertainty
- ❑ Resource portfolio costs under each scenario, results of sensitivities, risk analysis and other key considerations including system diversity and environmental footprint are used in this selection process.
- ❑ The preferred resource portfolio may be a hybrid portfolio which includes options from several of the optimized resource portfolios
- ❑ The preferred portfolio will be used to develop SWEPCO's five-year action plan




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Step 4: IRP Report Development

This phase of the IRP development involves:

- ❑ Results of the preferred resource portfolio and other key components of the draft IRP will be shared with stakeholders prior to finalizing the IRP.
- ❑ After receiving stakeholder feedback, the final document is prepared and reviewed to assure all regulatory requirements are met.
- ❑ The report is then presented to SWEPCO senior management prior to final submittal to the Louisiana Public Service Commission in July 2019.




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Planning Assumptions

- ❑ Commodity Forecast Prices
- ❑ Load Forecast – Energy and Demand
- ❑ Going-In Capabilities, Load and Reserves

Planning assumptions may change throughout the IRP development period as new information becomes available – stakeholders will be notified of any material revisions




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Commodity Forecast Prices

- Forecast Process
- Assumptions/Drivers
- Key Themes
  - Base Fundamental Forecasts
  - High, Low and No Carbon Cases
  - CPP Effective 2024




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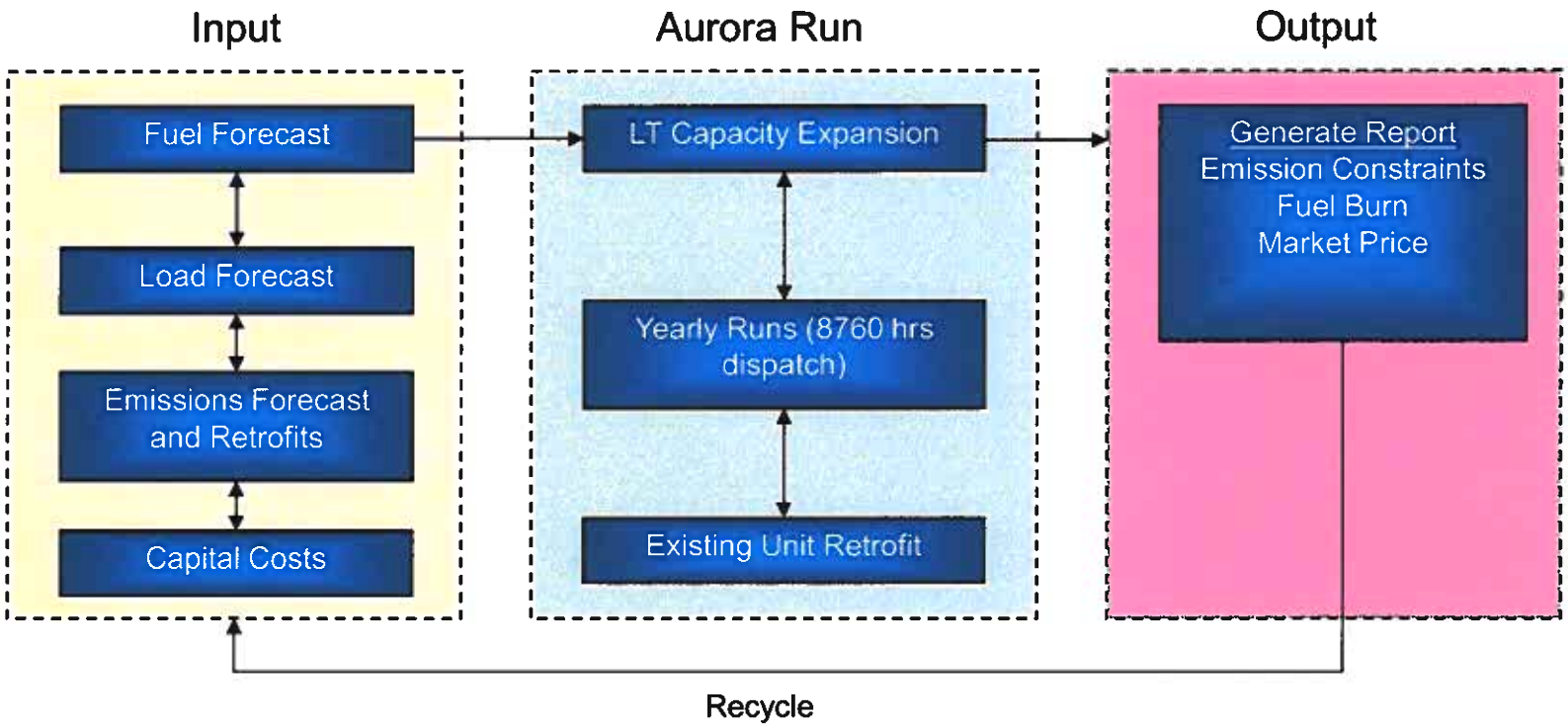
Forecast Process:

- Forecast requires iterative solution to satisfy all constraints



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SPP Market Price Development and Constraints:

- AEP employs the Aurora fundamentals-based model that uses multi-nodal, transmission-constrained dispatch logic to simulate real market conditions.
- Within SPP, as well as other RTO's, the drivers affecting electricity flow patterns and marginal pricing include fuel costs, wind generation-driven new transmission circuits, new generation, impending environmental regulation and development of the SPP Integrated Marketplace.
- Fundamentally, the price of electricity at each node along a transmission system equals the marginal cost of providing electricity at that node.
  - If transmission constraints exist, nodal electricity prices rise to the cost of local generation.
  - If transmission constraints are minimal, electricity must be delivered, transmission investments be recovered and distant generators be compensated – at values less than local generation.




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Scenarios & Sensitivities

- Scenarios encapsulate future states in a way that all input variables are simultaneously plausible.
  - Examples include
    - "low growth" or
    - "boom economy"

- Sensitivities change a single variable so that its impact within a scenario can be understood.
  - Examples include:
    - carbon tax,
    - high gas prices,
    - low gas prices
  - Sensitivities are not the basis for portfolio construction.




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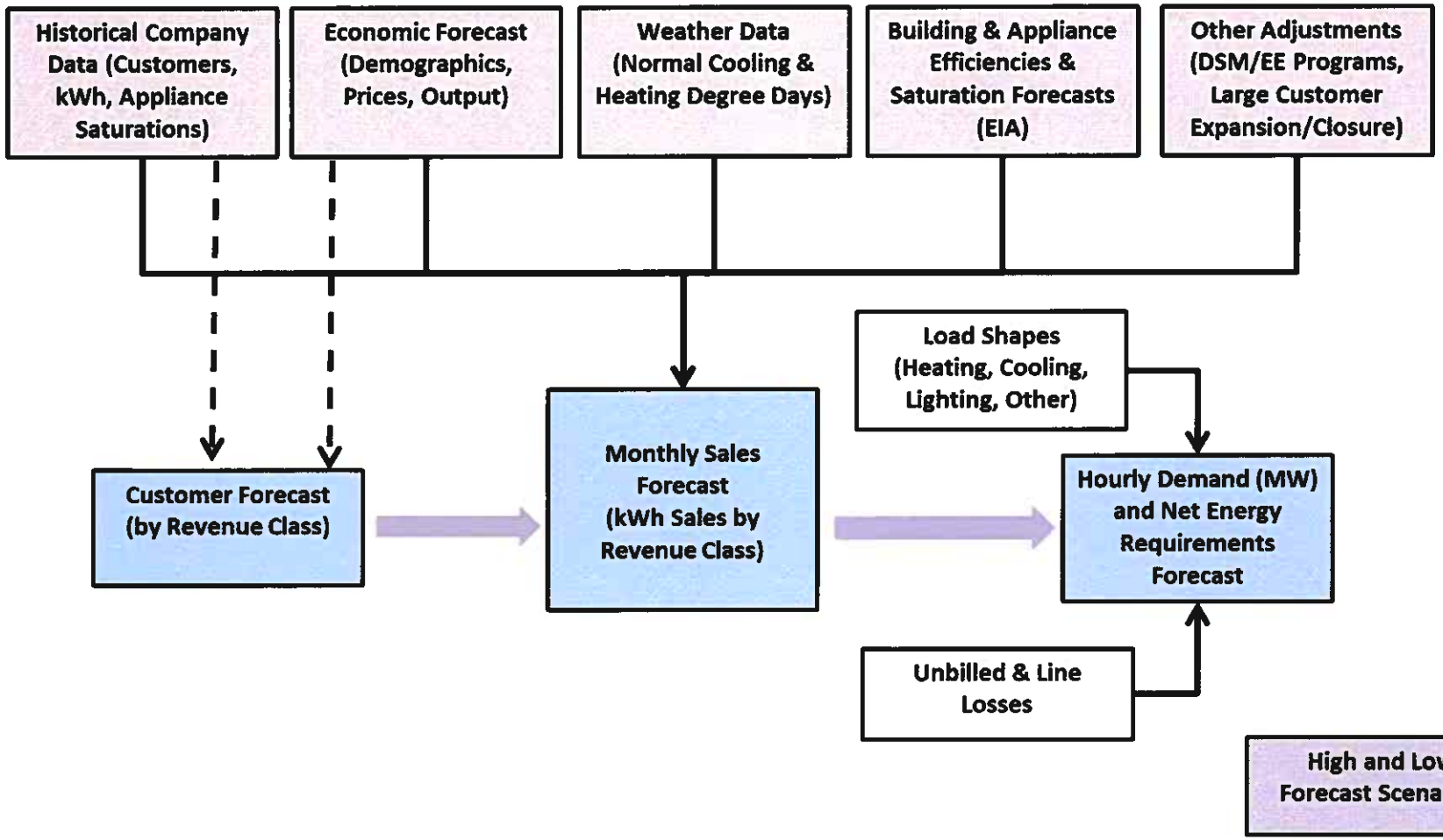
Demand/Load Forecasts

Load Forecast Process



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Drivers of Load Forecast

Key Drivers of Load

Economic data is provided by Moody's Analytics

❑ Residential

- Regional Economic Variables (Employment, Income)
- Demographics (Population, Households)
- Gross Regional Product
- Electricity Price
- State Natural Gas Price
- Mortgage Interest Rate
- Heating & Cooling Degree Days
- Prior period kWh and Customer count
- Appliance saturation (surveyed every 3-4 years)
- Appliance efficiency standards & trends
- Building standards & trends

❑ Other Ultimate

- Regional Economic Variables (Employment)
- Heating & Cooling Degree Days
- Prior Period kWh

❑ Commercial

- Regional Economic Variables (Employment, Income)
- Commercial Gross Regional Product
- Electricity Price
- State Natural Gas Price
- Heating & Cooling Degree Days
- Prior period kWh and Customer count
- Appliance saturation
- Appliance efficiency standards & trends
- Building standards & trends

❑ Industrial

- FRB Industrial Production Indices (Selected)
- Regional Economic Variables (Employment)
- Regional Coal Production
- Manufacturing Gross Regional Product
- Electricity & Petroleum Prices
- State Natural Gas Prices
- Prior period kWh




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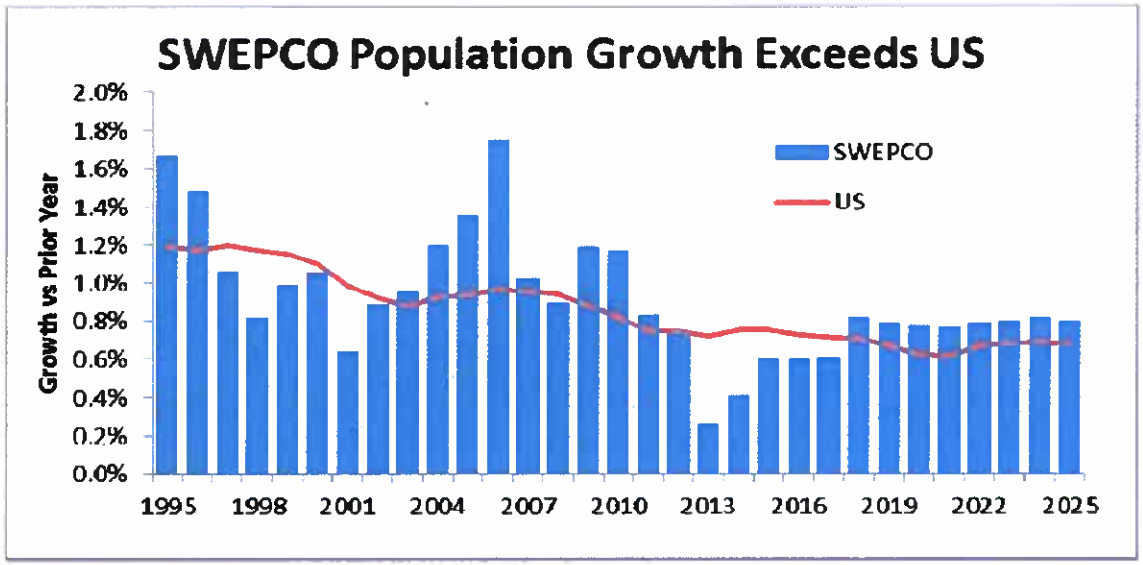
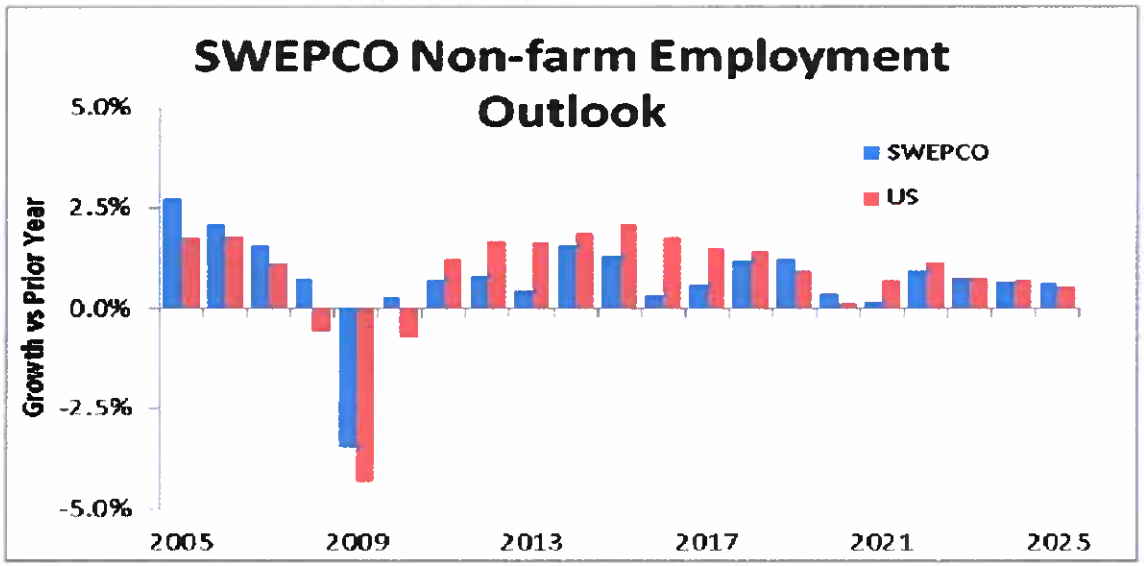
Economic Forecasts





- Population within SWEPCO's service territory expected to grow at 0.8% per year compared to 0.7% per year for the US over the next decade.
- SWEPCO's economic outlook for GRP (2.2% per year) and Non-farm employment (0.8% per year) will mirror the US over the next 10 years.

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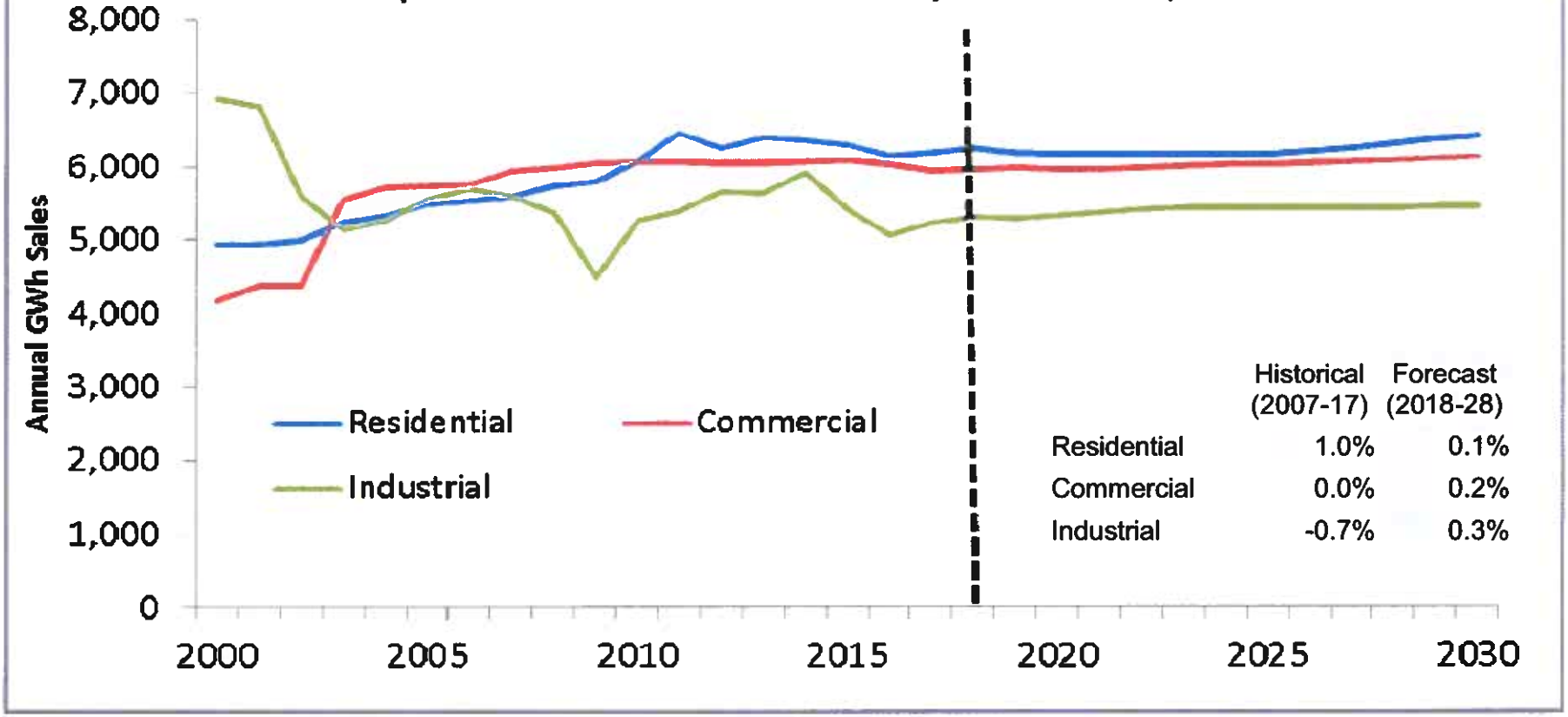
Energy Sales Outlook

SWEPCO GWh Sales

(Weather Normalized History & Forecast)



	Historical (2007-17)	Forecast (2018-28)
Residential	1.0%	0.1%
Commercial	0.0%	0.2%
Industrial	-0.7%	0.3%

- SWEPCO's service area expected load growth is impacted by both the economy (demographics) and federal, state and company energy efficiency.

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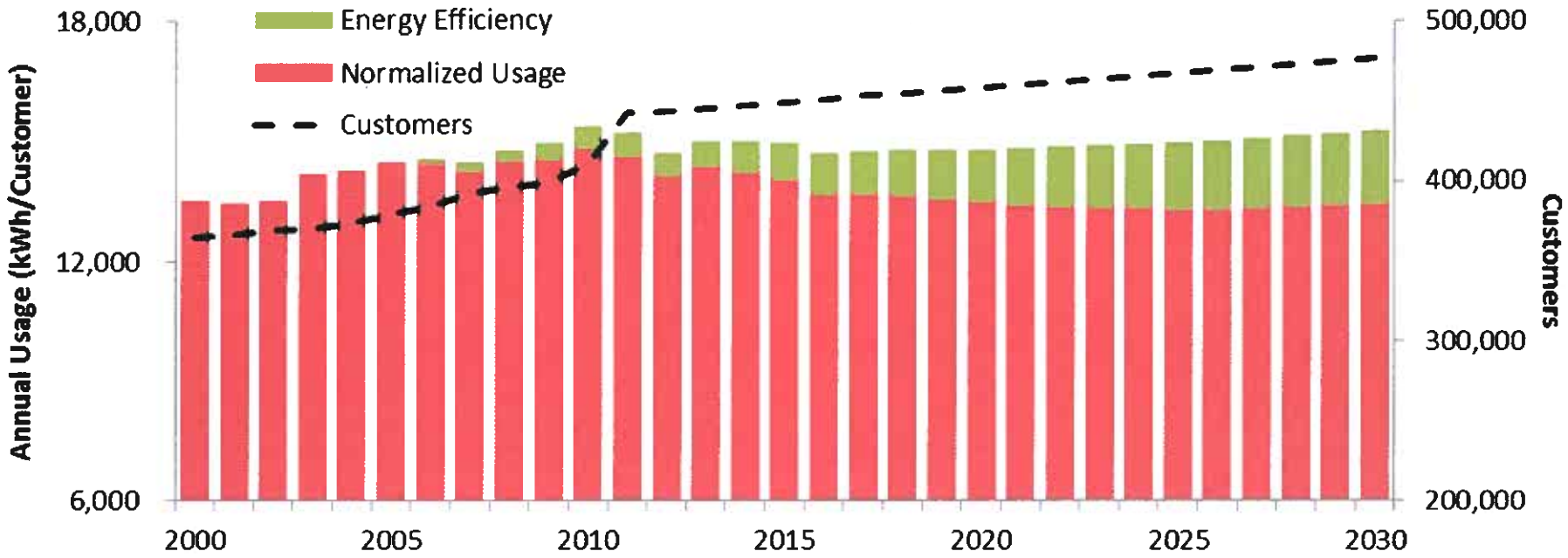
Declining Residential Load Growth

SWEPCO Residential Usage & Customer Growth



- Prior to the last decade, SWEPCO experienced steady growth in Residential customers and usage.
- Over the past decade, weaker demographics combined with an emphasis on energy efficiency (federal & state standards plus company sponsored programs) have significantly impacted the growth in Residential usage.
- Residential usage is expected to continue to decline throughout the next decade.

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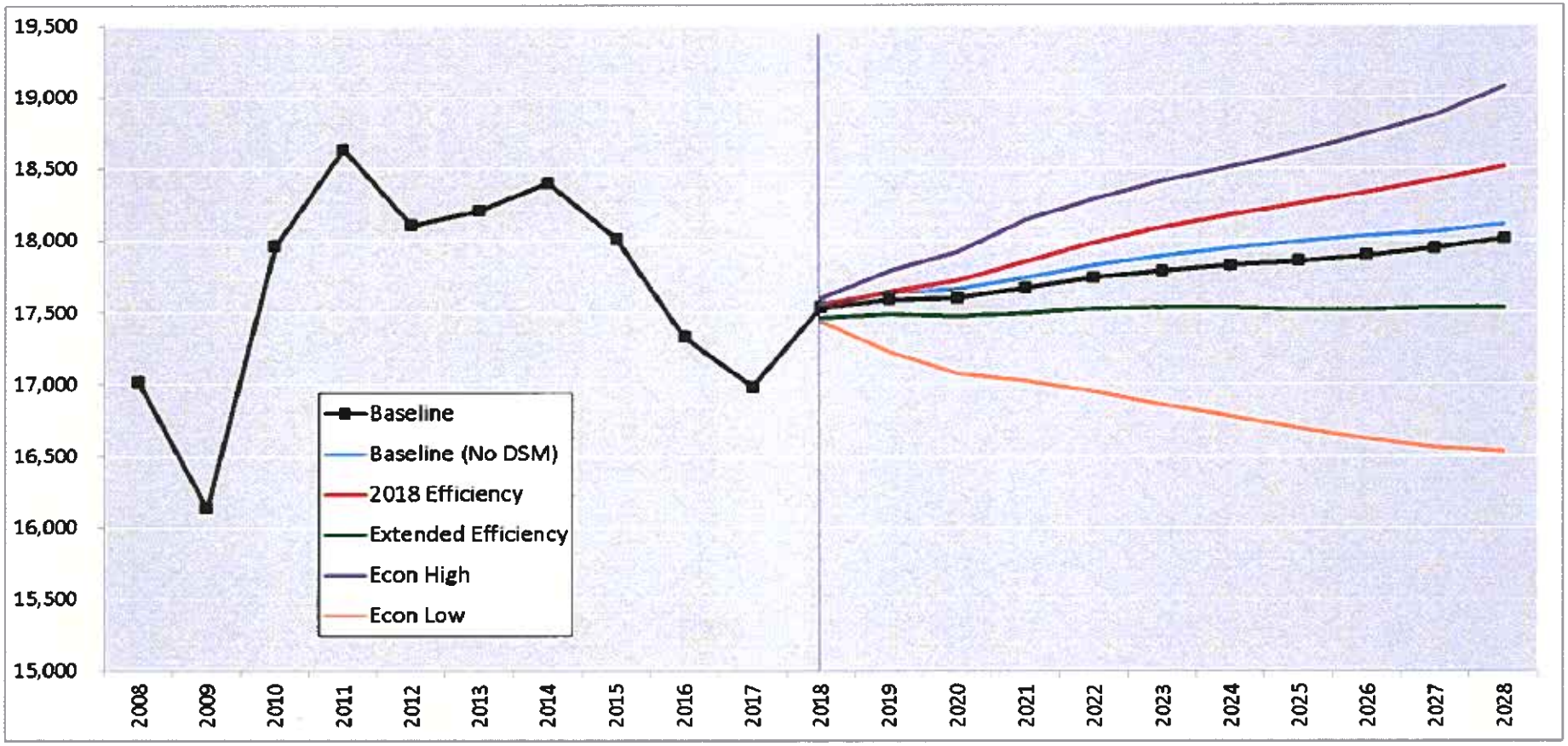
Load Forecast Scenarios



	Scenario:	Description:
From EIA	Baseline	Our baseline forecast presented here
	Baseline (No DSM)	Our baseline forecast excluding impact of future DSM programs
	2018 Efficiency	Forecast assuming current technology efficiencies are fixed indefinitely
	Extended Efficiency	Assuming additional efficiency standards are implemented in the future
	Econ High	Assuming much stronger economic conditions than assumed in baseline
	Econ Low	Assuming much weaker economic conditions than assumed in baseline

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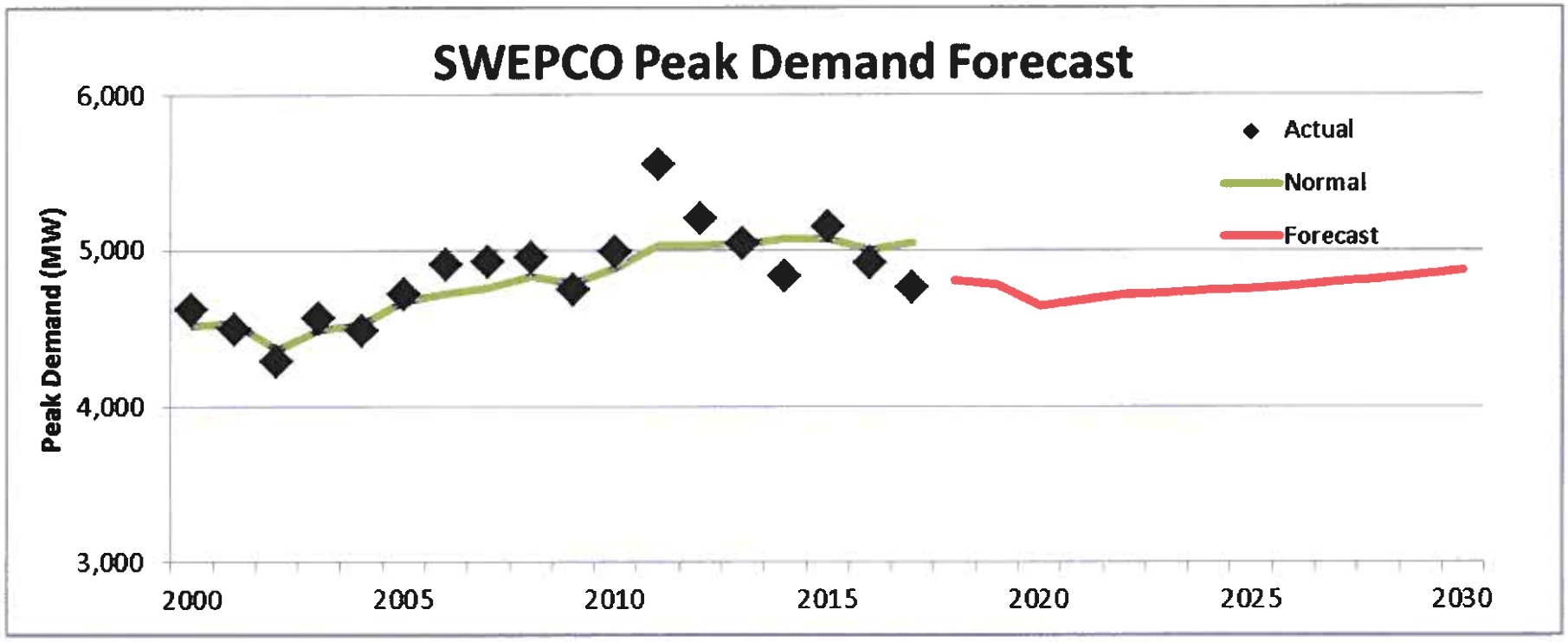
Demand Forecasts



- SWEPCO had two wholesale contract that expired in 2017 and another that expires at the end of 2019 that are not expected to renew. Combined, these loads represent approximately 335 MW that will no longer be served by SWEPCO.
- Historical normalized peak demand growth over the last 10 years has been -0.1%. Forecast peak demand growth of +0.1% over the next 10 years.

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SWEPCO Potential Resources - Overview

Coal

- Baseload and intermediate resource
- Higher CO_2 emissions than natural gas
- Abundant fuel source
- Option to place environmental controls on existing uncontrolled units to lower non-CO_2 emissions, or retire

Nuclear

- Baseload with high capacity factor
- Very low fuel and energy cost
- No air emissions
- Large water use
- Spent fuel storage issues
- High initial construction cost/risks

Natural Gas

- Moderate construction costs
- Lower CO_2 emissions than coal
- Slightly higher variable cost than coal
- Firm gas delivery service may increase costs

Wind and Solar

- Intermittent. Not always aligned with peak demand
- No emissions
- No fuel costs but some technologies have high capital costs
- Currently heavily driven by incentives and deliverability issues may raise cost

Energy Storage

- Provides peaking capacity and energy arbitrage
- High construction costs, expect cost to decline over the planning period
- Numerous technologies exist, current focus is Lithium Ion

Demand-Response

- Used to reduce peak load/capacity requirements
- Costs vary, but need to balance cost and customer reliability preferences
- Costs escalate with increased use
- May include customer owned generation

Energy Efficiency

- Low capital and operating costs
- Dependent on customer adoption
- Program costs vary
- Can include programs such as Volt VAR Optimization




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Planning assumptions for SWEPCO's IRP development

AEP System
New Generation Technologies
Key Supply-Side Resource Option Assumptions (a)(b)(c)

Type	Capability (MW) (d) Std. ISO	Summer	Winter	Installed Cost (c,e) ($/kW)	Full Load Heat Rate (HHV,Btu/kWh)	Fuel Cost ($/MBtu)	Variable O&M ($/MWh)	Fixed O&M ($/kW-yr)	Capacity Factor (%)	LCOE (f) ($/MWh)
Base Load										
Nuclear	1,610	1,560	1,690	7,900	10,500	0.91	6.24	145.43	80	176.3
Pulv. Coal with Carbon Capture (PRB)	540	520	570	9,200	12,500	2.28	5.60	91.79	75	230.6
Combined Cycle (1X1 "J" Class)	540	700	720	1,000	6,300	2.94	1.97	10.81	75	62.3
Combined Cycle (2X1 "J" Class)	1,080	1,410	1,450	800	6,300	2.94	1.73	9.16	75	57.5
Combined Cycle (2X1 "H" Class)	1,150	1,490	1,530	700	6,300	2.94	1.63	8.65	75	55.8
Peaking										
Combustion Turbine (2 - "E" Class) (g)	180	190	190	1,200	11,700	2.94	3.94	17.60	25	145.9
Combustion Turbine (2 - "F" Class, w/evap coolers) (g)	490	500	510	700	10,000	2.94	6.07	15.77	25	114.0
Aero-Derivative (2 - Small Machines) (g,h)	120	120	120	1,400	9,900	2.94	2.44	18.93	25	143.8
Recip Engine Farm	220	220	230	1,300	8,300	2.94	2.61	6.32	25	123.0
Battery	10	10	10	2,300	87% (i)	0.00	0.00	146.74	25	260.6

Notes:
(a) Installed cost, capability and heat rate numbers have been rounded
(b) All costs in 2018 dollars, except as noted.
(c) $/kW costs are based on summer capability
(d) All Capabilities are at 1,000 feet above sea level
(e) Total Plant Investment Cost w/AFUDC (AEP-East rate of 5.5%,site rating $/kW)
(f) Levelized cost of energy based on capacity factors shown in table
(g) Includes Dual Fuel capability and SCR environmental installation
(h) Includes Black Start capability
(i) Denotes efficiency, (w/ power electronics)




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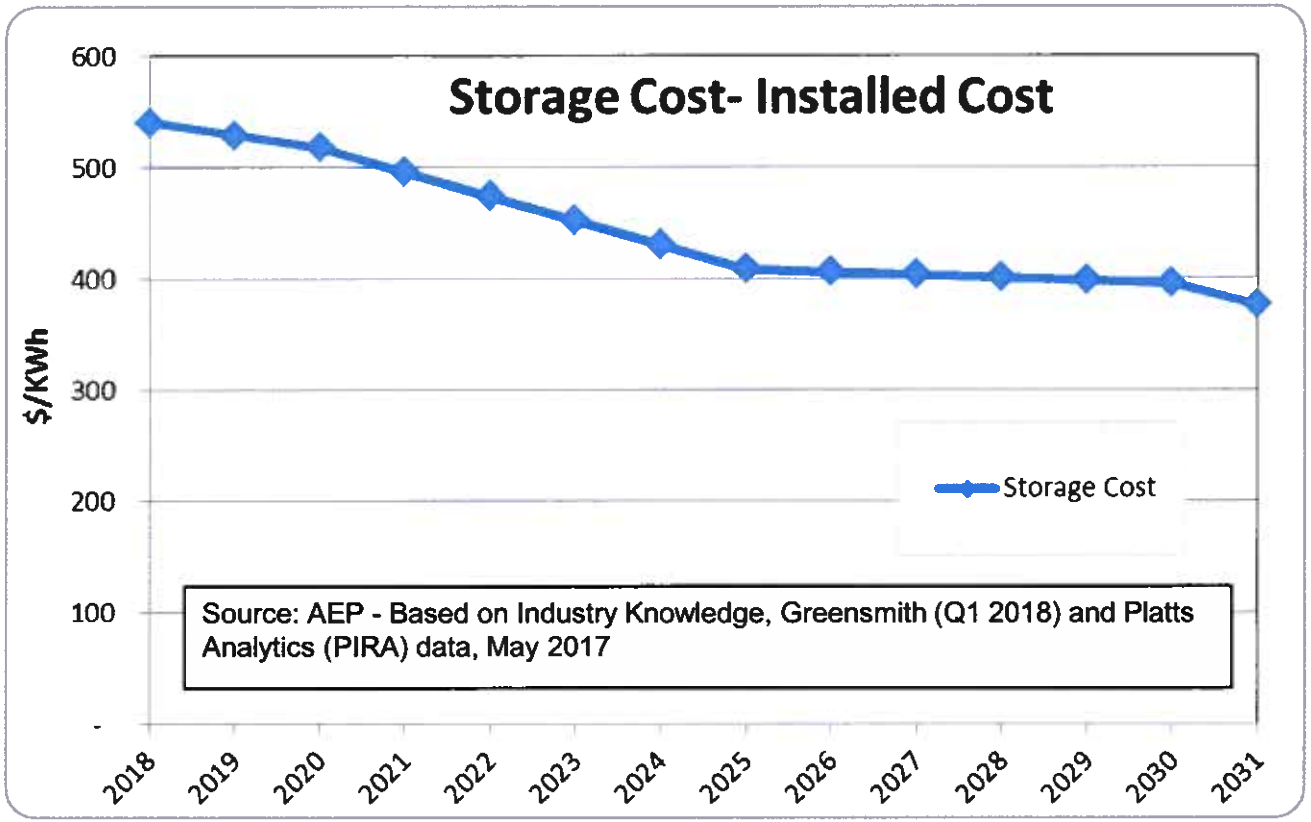
Planning assumptions for SWEPCO's IRP development

Preliminary Energy Storage – 10MW/40MWh Resource



- Based on Lithium Ion technology
- Primary value based on energy arbitrage

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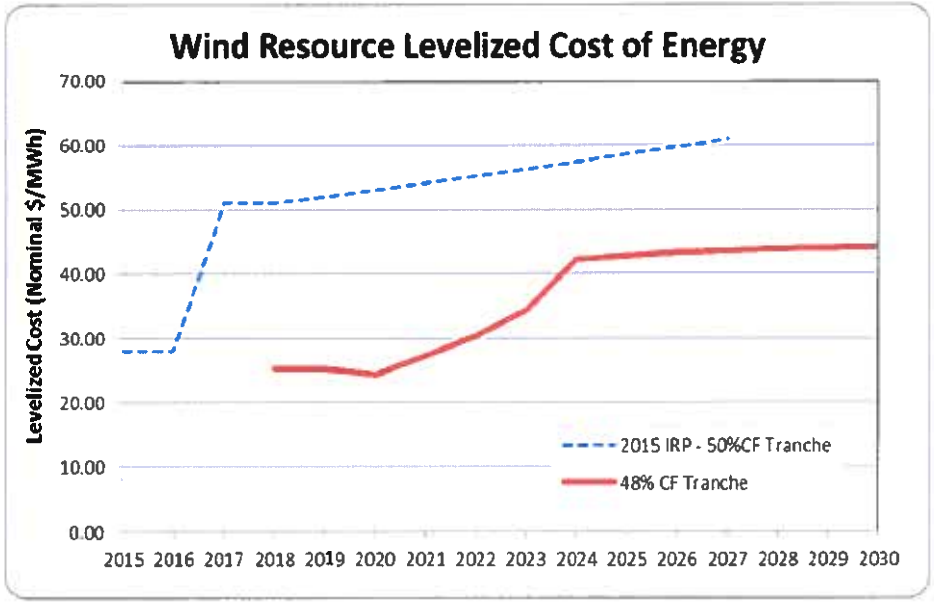
Planning assumptions (Modeling Constraints) for SWEPCO's IRP development

Wind

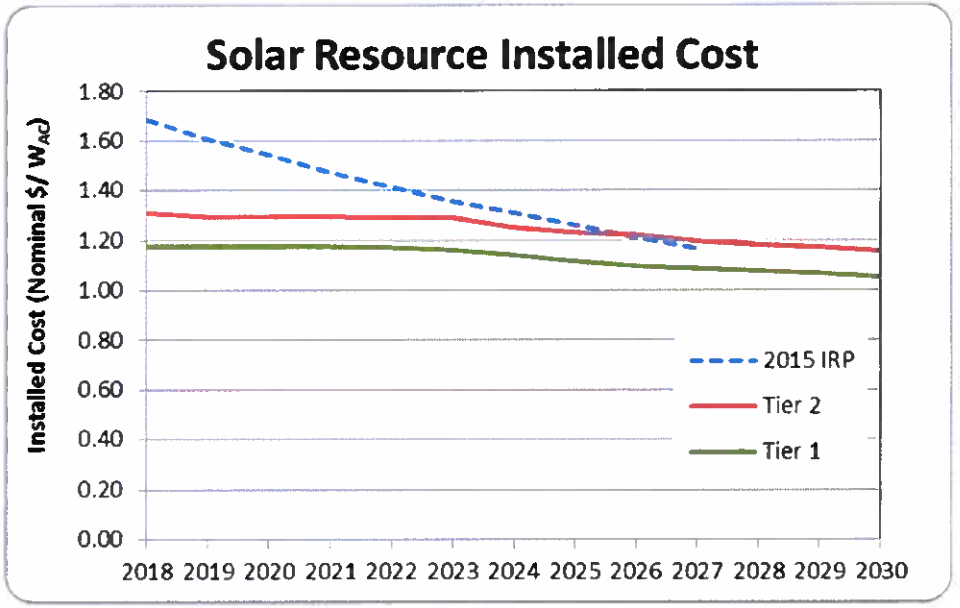


Updated pricing reflects extensions of Federal PTC

Assumed SPP capacity credit 5% for the first three years in-service, 15% capacity credit for the remainder of 25-year life

Assumed wind additions limited to approximately 40% of SWEPCO's energy demand, ~1,900MW; with a 600MW annual limit on wind additions

Solar



Updated pricing reflects extensions of Federal ITC

Pricing based on BNEF H2 2017 Solar Installed cost forecast. Both tiers have ~27% capacity factor; 33% capacity credit for entire 25-year life

Assumed solar additions limited to approximately 15% of SWEPCO's energy demand, ~1,300MW, over planning period; with a 300MW annual limit on solar additions

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Planning assumptions for SWEPCO's IRP development – Energy Efficiency

Residential

Bundle	Installed Cost ($/kWh)	Yearly Potential Savings (MWh) 2020-2024	Yearly Potential Savings (MWh) 2025-2029	Yearly Potential Savings (MWh) 2030-2040	Yearly Potential Savings (MWh) 2041-2045	Bundle Life
Thermal Shell - AP	$0.23	2,596	1,847	2,778	3,509	10
Thermal Shell - HAP	$0.35	13,811	12,778	6,847	13,512	10
Cooling - AP	$1.18	22,729	8,924	5,738	1,637	17
Cooling - HAP	$1.65	32,490	6,661	0	0	17
Water Heating - AP	$0.07	894	373	412	636	10
Water Heating - HAP	$0.10	4,756	3,643	1,409	2,699	10
Appliances - AP	$0.08	2,650	956	692	306	13
Appliances - HAP	$0.13	4,115	879	1,127	0	13
Lighting - AP	$0.03	8,705	0	71	0	30
Lighting - HAP	$0.05	16,302	1,273	243	171	30
Enhanced Customer Bill	$0.74	26,839	0	0	0	10

Commercial / Industrial

Bundle	Installed Cost ($/kWh)	Yearly Potential Savings (MWh) 2020-2024	Yearly Potential Savings (MWh) 2025-2029	Yearly Potential Savings (MWh) 2030-2040	Yearly Potential Savings (MWh) 2041-2045	Bundle Life
Heat Pump - AP	$9.93	3,006	845	202	0	15
Heat Pump - HAP	$14.89	3,757	312	0	0	15
HVAC Equipment - AP	$0.19	1,444	477	505	470	16
HVAC Equipment - HAP	$0.28	3,728	1,822	372	449	17
Indoor Screw-In Lighting - AP	$0.01	3,741	0	0	0	6
Indoor Screw-In Lighting - HAP	$0.02	5,720	0	0	0	6
Indoor HID/Fluorescent Lighting - AP	$0.19	39,152	9,555	3,338	0	13
Indoor HID/Fluorescent Lighting - HAP	$0.29	48,940	3,949	0	0	13
Outdoor Lighting - AP	$0.13	5,972	1,570	366	0	15
Outdoor Lighting - HAP	$0.19	7,465	612	0	0	15

AP = Achievable Potential HAP = High Achievable Potential

EE bundles are made available as resource options




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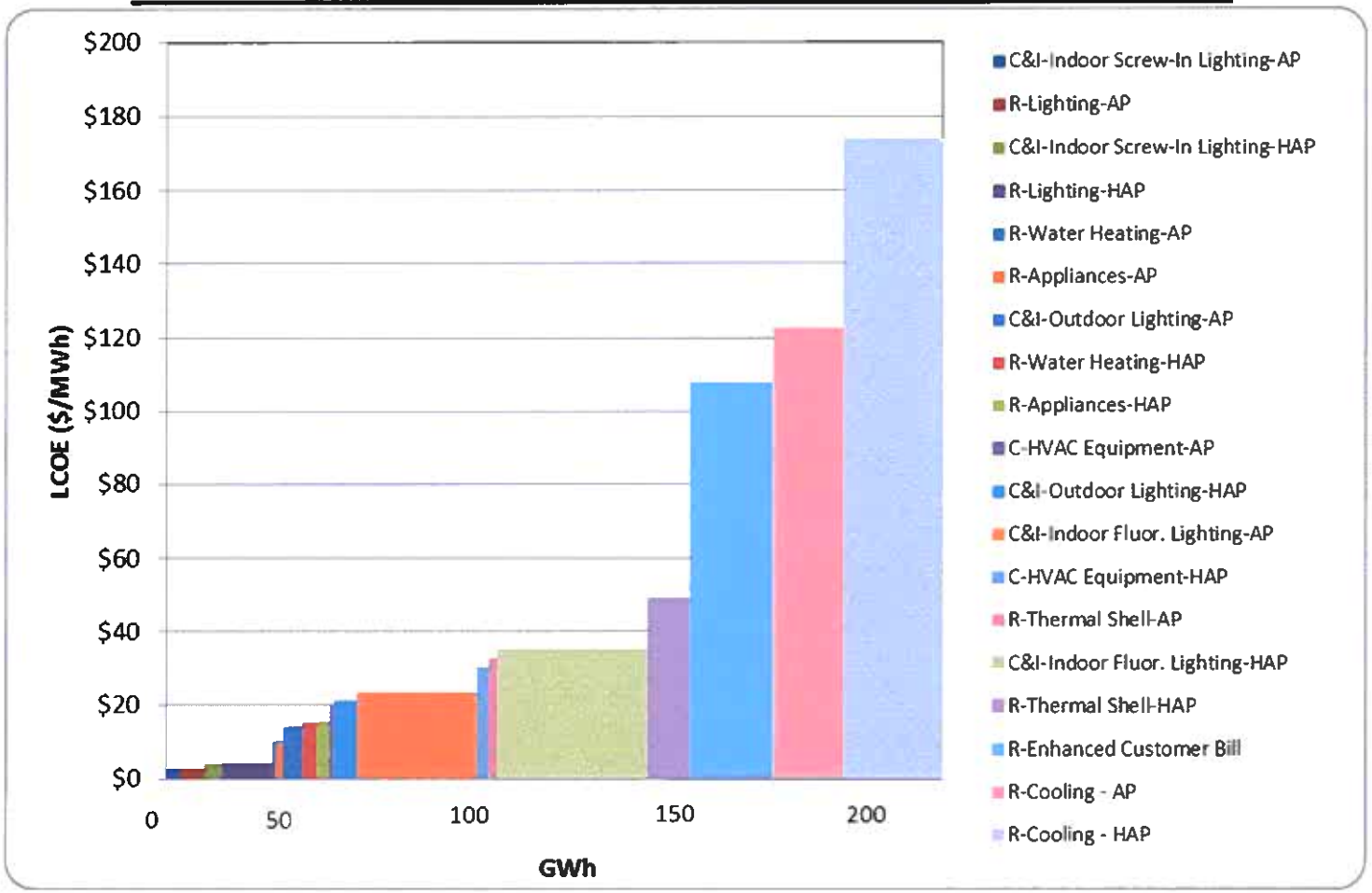
Planning assumptions for SWEPCO's IRP development – Energy Efficiency

Residential, Commercial & Industrial EE Resources -

Levelized Cost of Bundle and 2019 Potential Energy Savings



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❑ Volt VAR Optimization Resources:

Tranche	No. of Circuits	Capital Investment	Annual O&M	Demand Reduction (kW)	Energy Reduction (MWh)
1	40	$13,360,000	$400,800	20,679	96,007
2	41	$13,694,000	$410,820	11,323	52,570
3	41	$13,694,000	$410,820	9,585	44,503
4	40	$13,360,000	$400,800	8,443	39,200
5	40	$13,360,000	$400,800	7,778	36,111
6	40	$13,360,000	$400,800	7,334	34,048
7	40	$13,360,000	$400,800	6,766	31,414
8	40	$13,360,000	$400,800	6,164	28,616
9	41	$13,694,000	$410,820	5,567	25,847
10	41	$13,694,000	$410,820	5,012	23,270
11	40	$13,360,000	$400,800	3,992	18,533
12	41	$13,694,000	$410,820	3,420	15,878
13	41	$13,694,000	$410,820	2,816	13,072
14	41	$13,694,000	$410,820	2,247	10,432
15	41	$13,694,000	$410,820	1,586	7,365

One Tranche of VVO may be selected per year, based on planning and implementation constraints




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Stakeholder Feedback Process for SWEPCO's IRP development

- Initial Stakeholder meeting to be on July 25, 2018 to discuss study assumptions and sensitivity analyses
- Stakeholders have until September 25, 2018, to provide written comments
- All Stakeholder comments should be addressed to lmferry-nelson@aep.com
- Comments are welcome on any aspect of the IRP process:
  - Fundamental Pricing Assumptions
  - Load Forecast
  - Cost of technology options
  - DSM/Energy Efficiency assumptions
  - Sensitivity cases
  - Portfolio selection
  - Other
- SWEPCO will consider each stakeholder request
- SWEPCO may need to contact stakeholders to clarify comments, therefore stakeholders should designate a contact person to address SWEPCO's questions




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Next Steps – Overall IRP Stakeholder Process

Stakeholder input is an important part of the IRP process. SWEPCO identified three main objectives for stakeholder engagement:

- **Inform:** Increase stakeholders' understanding of the IRP process, key assumptions used in the IRP, and challenges that SWEPCO faces.
- **Listen:** Understand our stakeholders' resource planning concerns and objectives.
- **Consider:** Provide a forum for productive stakeholder feedback on specific topics at key points in the IRP process to inform SWEPCO's decision-making.

Two stakeholder workshops will be held during the planning process. The tentative timeline is shown below.

ATTACHMENT
4

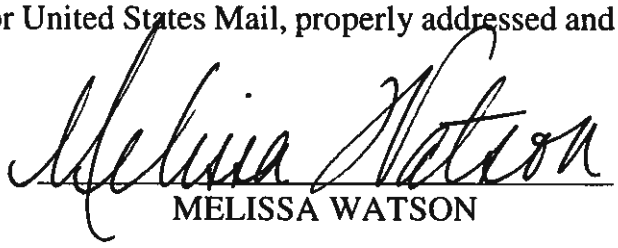
SOUTHWESTERN ELECTRIC POWER COMPANY
IRP PROCESS SCHEDULE OF EVENTS

Second Full IRP Cycle
Revised September, 24, 2018

Event	Description	Number of Months from IRP Filing Date	Date
1	Utility submits its request to initiate the IRP process, which should specify dates in accordance with this schedule of events, and a non-disclosure agreement.	At filing date (IRP Cycle Date)	December 29, 2017
2	Utility files data assumptions to be used in the IRP and a description of studies to be performed.	1	January 29, 2018
3	Utility holds first Stakeholder Meeting.	7	July 25, 20118
4	Stakeholders may file written comments.	9	September 25, 2018
5	Draft IRP Report published.	12	December 21, 2018
6	Utility holds second Stakeholder Meeting.	13	January 2019 *Specific date to be noticed, but will target week of January 21, 2019, excluding January 21 as that is a Commission holiday.
7	Stakeholders may file comments about the draft IRP Report.	15	March 25, 2019
8	Staff files comments about draft IRP Report.	16	April 25, 2019
9	Final IRP Report filed by the utility.	19	July 25, 2019
10	Stakeholders submit list of disputed issues and alternative recommendations.	21	September 25, 2019
11	Staff submits recommendations to the Commission including whether or not a proceeding is necessary for the resolution of disputed issues.	22	October 25, 2019
12	Commission Order acknowledging the IRP or setting disputed issues for hearing.	24	December 2019

CERTIFICATE OF SERVICE

I hereby certify that a copy of the above and foregoing has been served upon all parties of record by email, fax or United States Mail, properly addressed and postage prepaid, on this September 24, 2018.



MELISSA WATSON

Service List for I-34715
as of 9/24/2018

Commissioners
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Foster L. Campbell, Commissioner

LPSC Staff Counsel
Melissa Watson, LPSC Staff Attorney

LPSC Staff
Donnie Marks, LPSC Utilities Division

LPSC Consultant

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