SOUTHWEST POWER POOL
ECONOMIC STUDIES WORKING GROUP MEETING

May 7, 2020
Net Conference

SUMMARY OF MOTIONS AND ACTION ITEMS

General:

- Approved April 7-8, 2020 ESWG meeting **minutes**
- **Action Items 183 and 190 merged**

2021 ITP:

- Approved **2021 ITP – Resource Plan – Phase 1: SPS Policy Resource Additions requests**

SOUTHWEST POWER POOL
ECONOMIC STUDIES WORKING GROUP MEETING
May 7, 2020
Net Conference

MINUTES

AGENDA ITEM 1 – ADMINISTRATIVE ITEMS

Economic Studies Working Group (ESWG) Chair Alan Myers called the meeting to order at 8:00 a.m. The following members were in attendance or represented by proxy:

Al Tamimi, SUNC
Alan Myers, ITC
Anita Sharma, AEP
Bennie Weeks, Xcel
Calvin Daniels, WFEC
Gayle Nansel, WAPA
Jeremy Severson, BEPC
Jody Holland, SCMCN
Jon Iverson, OPPD
John Olsen, Evergy
Kurt Stradley, LES
Michael Watt, OMPA
Randy Collier, CUS
Tim Owens, NPPD
Warren Whitson, Southern
Zac Hager, OGE

Proxies:
Mike Wise for Kyle McKinney, GSEC
JP Meitner for John Olsen, Evergy (in case of intermittent internet coverage)

(Attachment 1 – May 06-07, 2020 ESWG Attendance)
(Attachment 2 – Proxy Statements)

Joshua Norton (SPP) confirmed there was a quorum and provided the antitrust statement. Alan Myers reviewed the agenda for any changes. (Attachment 3 – May 06-07 ESWG Agenda)

> **Kurt Stradley made a motion, seconded by Calvin Daniels to approve the agenda. The motion was approved unanimously.**

AGENDA ITEM 2 – CONSENT AGENDA

The consent agenda included the following item:

Meeting Minutes – April 7-8, 2020 (Attachment 4 – April 7-8 2020 ESWG Minutes)

The consent agenda was approved.

AGENDA ITEM 3 – REVIEW OF PAST ACTION ITEMS

Joshua Norton (SPP) reviewed past action items and made updates. Action item (AI) 183 was for SPP staff to perform a transmission outage analysis to determine the appropriate APC benefit percentage to utilize for the mitigation of transmission outages benefit metric. ESWG previously approved the methodology for staff to perform the analysis, working with SPP operations on additional APC benefit with outages included. This item was merged into AI 190 which is for staff to utilize the results from the upcoming RCAR III study to determine the ratio of APC benefit to transmission outages benefit to be applied in future ITP assessments. (Attachment 5 – Past Action Items)

AGENDA ITEM 4A – 2020 ITP SCHEDULE UPDATE

Sherri Maxey (SPP) presented the 2020 ITP schedule update. (Attachment 6 – 2020 ITP Assessment – Schedule)

AGENDA ITEM 5A – 2021 ITP SCHEDULE UPDATE

Sherri Maxey (SPP) presented the 2021 ITP schedule update. (Attachment 7 – 2021 ITP Assessment – Schedule)

AGENDA ITEM 5B – 2021 ITP - RESOURCE PLAN PHASE 1: SECTION 10.3 ASSESSMENT

Bennie Weeks (Xcel Energy) presented an SPS request for approval of new 2021 ITP – Resource Plan – Phase 1 results. (Attachment 8 – 2021 ITP – Resource Plan Phase 1 – 10.3 Assessment)

Zac Hager made the motion, seconded by Jeremy Severson, to approve the Section 10.3 SPS results for the 2021 ITP – Resource Plan – Phase 1 milestone. The motion was approved with one abstention: Jody Holland.

AGENDA ITEM 5C – 2021 ITP - RESOURCE PLAN PHASE 2

Kirk Hall (SPP) reviewed the allocation of conventional resources and discussed the three exception requests received from AEP, SPS and OKGE. The final approval request for the 2021 ITP – Resource Plan Phase 2 would be delayed due to exception requests, as well as Section 10.3

changes impacting both phases 1 and 2 of the Resource Plan milestone. (Attachment 9 – 2021 ITP – Resource Plan Phase 2)

AGENDA ITEM 5D – 2021 ITP - SITING PLAN

Joshua Norton (SPP) reviewed a high level overview of the Battery Siting Plan process. (Attachment 10 – Siting Plan)

AGENDA ITEM 5E – 2021 ITP – MARKET ECONOMIC MODEL (MEM) BUILD

Charlton Hill (SPP) presented an update of the 2021 ITP MEM build. The Bakken load forecasts were discussed, and Casey Cathey (SPP) discussed staff's plan to evaluate any COVID-19 impacts. (Attachment 11 – Market Economic Model Build)

AGENDA ITEM 6 – SPP-MISO CSP UPDATE

Neil Robertson (SPP) provided a verbal SPP-MISO CSP update.

AGENDA ITEM 7 – RR 403: CHANGE TO ITP OPERATIONAL MODEL DEVELOPMENT

Will Tootle (SPP) reviewed the current language for RR 403 and the overall issue of determining what the threshold should be, and if it should be lower or more flexible. There were two versions provided of the RR403 verbiage and a straw poll was taken to determine whether staff or stakeholder verbiage version was preferred. The Revision Request will continue to be available for comments, and staff will continue to further review the stakeholder version and evaluate any schedule impacts. (Attachment 12 – RR 403 Changes for Persistent Operational Issues presentation) (Attachment 13 – RR 403 Changes for Persistent Operational Issues) (Attachment 14 – RR 403 Comments)

> **The straw poll results were that 11 preferred the stakeholder version, while 4 preferred the staff version.**

AGENDA ITEM 8 – ESWG ACTION ITEM 201: INTERCHANGE METHODOLOGY

This item was not discussed.

ECONOMIC STUDIES WORKING GROUP MINUTES

May 7, 2020

AGENDA ITEM 9 – CLOSING ITEMS

There were no action items taken.

Respectfully Submitted,

Joshua Norton

Secretary

Name	Company/Email	Attendance
Aaron Vander Vorst	avandervorst@tradewindenergy.com	Webex
Adam Bell	abell@spp.org	Webex
Ahmed	aalazzawi@spp.org	Webex
Ajay	alakshmanan@teainc.org	Webex
Al Tamimi	atamimi@sunflower.net	Webex
Alan Myers	amyers@itctransco.com	Webex
Amber Greb	agreb@spp.org	Webex
Andrew Berg	Andrew.Berg@mrenergy.com	Webex
Anita Sharma (AEP)	asharma@aep.com	Webex
Antonio Barber	abarber@spp.org	Webex
Ben Abing	babing@itctransco.com	Webex
Ben Elsey	ben.r.elsey@xcelenergy.com	Webex
Bennie Weeks (SPS)	bennie.weeks@xcelenergy.com	Webex
Bill Leung (NPRB)	bleung@bjleung.com	Webex
Brandon McCracken (WFEC)	b_mccracken@wfec.com	Webex
Brian Johnson	bajohnson1@aep.com	Webex
Brian Rounds (AESL)	brian.rounds@aeslconsulting.com	Webex
Brooke Keene	BKEENE@SPP.org	Webex
Calvin Daniels	calvin.daniels@wfec.com	Webex
Casey Cathey	ccathey@spp.org	Webex
Charlton Hill	chill@spp.org	Webex
Chris Cranford	ccranford@spp.org	Webex
Chris Jamieson	cjamieson@spp.org	Webex
Chris Matthes	camatthes@aep.com	Webex
Clifford Franklin	cfranklin@sunflower.net	Webex
David Mindham	david.mindham@edpr.com	Webex
Derek Sunderman	dsunderman@savionenergy.com	Webex
Eddie Watson	ewatson@spp.org	Webex
Eric Rodriguez reyes	Eric.Rodriguezreyes@nexteraenergy.com	Webex
Gayle Freier	gfreier@spp.org	Webex
Gayle Nansel	nansel@wapa.gov	Webex
jacobj	jacobj@acespower.com	Webex
James Bailey (SPP)	jbailey@spp.org	Webex
Jason Atwood	jason.atwood@us.abb.com	Webex
Jason Mazigian (BEPC)	jmazigian@bepc.com	Webex
Jason Shook (GDS/ETEC)	JASON.SHOOK@GDSASSOCIATES.COM	Webex
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Jeff Knottek	jeff.knottek@cityutilities.net	Webex
Jeremy Severson	jseverson@bepc.com	Webex
Jerry Bradshaw (SPRM)	jerry.bradshaw@cityutilities.net	Webex

Jim Jacoby (AEP)	jwjacoby@aep.com	Webex
Jody Holland	jholland@gridliance.com	Webex
Joe Fultz	jfultz@grda.com	Webex
John Varnell	jvarnell@tnsk.com	Webex
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Jon Iverson	jiverson@oppd.com	Webex
jonathan.surls	jonathan.surls@energyexemplar.com	Webex
Jordan Schmick	jordan.h.schmick@xcelenergy.com	Webex
Joshua Norton	jnorton@spp.org	Webex
Joshua Pilgrim	jpilgrim@spp.org	Webex
Josie Daggett (WAPA)	daggett@wapa.gov	Webex
JP Meitner	james.meitner@evergy.com	Webex
Julie Tackett (WFEC)	j_tackett@wfec.com	Webex
Kelsey Allen	kallen@spp.org	Webex
Kirk Hall	khall@spp.org	Webex
Kurt Stradley	kstradley@les.com	Webex
Liz Gephardt (SPP)	lgephardt@spp.org	Webex
Matt R.	mrudy@itctransco.com	Webex
mckina	adam.mckinnie@psc.mo.gov	Webex
Michael Odom	modom@spp.org	Webex
Michael Watt	mwatt@ompa.com	Webex
Michael Wegner (ITC)	mwegner@itctransco.com	Webex
Mike Swan	mswan@oppd.com	Webex
Mike Wise	mwise@gsec.coop	Webex
Nathan McNeil (MIDW)	nmcneil@mwenergy.com	Webex
Neeya Toleman (SPP)	ntoleman@spp.org	Webex
Neil Robertson (SPP)	nrobertson@spp.org	Webex
Patrick Hayes	phayes@lspower.com	Webex
Paul Vovk	pvovk@oppd.com	Webex
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Randy Collier (CUS)	randy.collier@cityutilities.net	Webex
Raul Perez guerrero	raul.perez@nexteraenergy.com	Webex
Robert Safuto (Customized Energy	rsafuto@ces-ltd.com	Webex
Ryan Baysinger	ryan.baysinger@kcpl.com	Webex
Ryan Benton	rbenton@mwenergy.com	Webex
Ryan Yokley	ryokley@sunflower.net	Webex
Sherri Maxey	smaxey@spp.org	Webex
Steve Gaw	rsgaw1@gmail.com	Webex
Steve Hohman	shohman@oppd.com	Webex
Tammy Bright	tbright@spp.org	Webex
Tim Owens	tjowens@nppd.com	Webex

Tyler Fletcher	tjfletcher@burnsmcd.com	Webex
Warren	wwhitson@southernco.com	Webex
Will Tootle	wtootle@spp.org	Webex
Yohan Sutjandra	ysutjandra@teainc.org	Webex
Zac Hager	hagerzc@oge.com	Webex

Proxy Statements

Member	Proxy	Note
Kyle McKinney	Mike Wise	Proxy for May 6-7, 2020 meeting
John P. Olsen	JP Meitner	Proxy in case of intermittent internet coverage

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From: McKinney Kyle <kmckinney@gsec.coop>
Sent: Thursday, April 30, 2020 3:54 PM
To: Joshua Norton <jnorton@spp.org>; Myers, Alan <amyers@itctransco.com>
Cc: Mike Wise <mike@gsec.coop>
Subject: **External Email** May 6-7 ESWG Meeting Proxy

Hey guys, I just wanted to let you know that Mike Wise will have my proxy for next weeks meeting.

I hope yall are doing well!

Sr. Modeling Analyst – Settlements, Markets & Resource Planning
E: kmckinney@gsec.coop
Golden Spread Electric Coop.
905 S Fillmore St, Amarillo, TX 79101

From: John Olsen <John.Olsen@evergy.com>
Sent: Thursday, May 7, 2020 8:21 AM
To: Myers, Alan K. <amyers@Itctransco.com>; Joshua Norton <jnorton@spp.org>
Cc: James Meitner <James.Meitner@evergy.com>
Subject: [EXT] ESWG Proxy

I am expecting intermittent coverage from my internet provider today. Therefore, if I don't respond for a vote, JP Meitner will have my proxy.

Thanks,

John P. Olsen
Sr. Director, Large T&S Construction
Evergy
John.Olsen@evergy.com
www.Evergy.com

Westar Energy and KCP&L are now Evergy.

SOUTHWEST POWER POOL, INC.
ECONOMIC STUDIES WORKING GROUP MEETING

May 7, 2020
Net Conference

AGENDA

ESWG Thursday, 8:00a.m. – 12:00p.m.

1. Administrative Items ..... Alan Myers (15 minutes)
   - A. Call to Order, Introductions ..... Alan Myers
   - B. Receipt of Proxies ..... Joshua Norton
   - C. Review of Agenda[1] ..... Alan Myers
   - D. Antitrust Reminder ..... Joshua Norton
2. Consent Agenda[1]
   - A. Meeting Minutes – April 7-8, 2020
3. Review of Past Action Items[1] ..... Joshua Norton (10 minutes)
4. 2020 ITP Assessment ..... (10 minutes)
   - A. Schedule[1] ..... Sherri Maxey (10 minutes)
5. 2021 ITP Assessment ..... (100 minutes)
   - A. Schedule[1] ..... Sherri Maxey (10 minutes)
   - B. Resoure Plan Phase 1: 10.3 Assessment (Approval Item)[1] ..... Bennie Weeks (30 minutes)
   - C. Resource Plan Phase 2[1] ..... Kirk Hall (30 minutes)
   - D. Siting Plan[1] ..... Joshua Norton (10 minutes)
   - E. Market Economic Model Build[1] ..... Charlton Hill (20 minutes)
6. CSP Update ..... Neil Robertson (15 minutes)
7. RR 403: Operational Needs Evaluation (Approval Item) [1] ..... Will Tootle (30 minutes)

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[1] Background Material Included

8. ESWG Action Item 201: Interchange Methodology[1] ..... Chris Jamieson (30 minutes)

9. Closing Items..... All (10 minutes)

   A. Summary of Action Items (Joshua Norton)

   B. April Meeting Agenda Items

   C. Future Meetings

      i) May 26th, 2020: Net Conference

      ii) June 10-11, 2020: Net Conference

      iii) July 9-10, 2020: SPP Office, Little Rock, AR

      iv) August 5-6, 2020: GSEC Offices, Amarillo, TX

SOUTHWEST POWER POOL
ECONOMIC STUDIES WORKING GROUP MEETING

April 7-8, 2020
Net Conference

SUMMARY OF MOTIONS AND ACTION ITEMS

General:

- Approved February 26 ESWG and March ESWG meeting **minutes**
- Endorsed **no change to Discount Rate** and marked **Action Item 207 complete**

2020 ITP:

- Approved a **single Study Cost Estimate window** be used for the 2020 ITP

2021 ITP:

- Approved **2021 ITP Siting Manual**

SOUTHWEST POWER POOL
ECONOMIC STUDIES WORKING GROUP MEETING
April 7-8, 2020
Net Conference

MINUTES

AGENDA ITEM 1 – ADMINISTRATIVE ITEMS

Economic Studies Working Group (ESWG) Chair Alan Myers called the meeting to order at 1:00 p.m. The following members were in attendance or represented by proxy:

Al Tamimi, SUNC
Alan Myers, ITC
Anita Sharma, AEP
Bennie Weeks, Xcel
Calvin Daniels, WFEC
Gayle Nansel, WAPA
Jeremy Severson, BEPC
Jody Holland, SCMCN
Jon Iverson, OPPD
John Olsen, Evergy
Kurt Stradley, LES
Kyle McKinney, GSEC
Michael Watt, OMPA
Randy Collier, CUS
Tim Owens, NPPD
Warren Whitson, Southern
Zac Hager, OGE

Proxies:
Phil Westby for Jeremy Severson
JP Meitner for John Olsen

(Attachment 1 – Attendance) (Attachment 2 – Proxy)

Joshua Norton (SPP) confirmed there was a quorum and provided the antitrust statement. Alan Myers reviewed the agenda for any changes. (Attachment 3 – Agenda)

Calvin Daniels made a motion, seconded by Tim Owens to approve the agenda. The motion was approved unanimously.

AGENDA ITEM 2 – 2020 ITP SCHEDULE UPDATE (TWG, PCWG JOINT) (APPROVAL ITEM)

Due to the delays in the 2020 ITP, the study was scheduled to complete roughly 45 days after needed to meet the October MOPC and board cycle. Liz Gephardt (SPP) presented an updated schedule for the 2020 ITP that included a proposal for one study cost estimate window with extended time instead of two shorter windows. (Attachment 4 – 2020 ITP Update)

ESWG:

Calvin Daniels made the motion, seconded by Anita Sharma, to approve a single Study Cost Estimate window be used for the 2020 ITP. The motion passed with 4 votes against: Al Tamimi, Bennie Weeks, Jon Iverson, and John Olsen.

TWG:

Noman Williams (Gridliance) made the motion, seconded by Steve Hardebeck (OG&E), to approve a single Study Cost Estimate window be used for the 2020 ITP. The motion passed with 3 votes against: Derek Brown (Evergy), Cliff Franklin (Sunflower), and Jarred Cooley (Xcel Energy).

Evergy:

"Evergy voted against SPP's recommendation to use a single Study Cost Estimate window for the 2020 ITP due to the following concerns with the proposed study window:

• Evergy receives a large quantity of estimate requests and does not believe three weeks is enough time to complete good quality, accurate estimates for all requests.

• Evergy often needs clarification of the project scope to provide estimates, which can mean delays while waiting on a response from SPP to questions.

• The proposed three week window includes the 4th of July holiday, which is a frequent time for employees to be out of office, resulting in less availability to complete estimates." – John Olsen

Sunflower:

"Sunflower votes "No", at both TWG and ESWG, on the SPP staff proposal to only have a single Study Cost Estimate window for ITP 2020.

Sunflower agrees with Entergy, SPS, and Evergy members that a single window does not allow sufficient time properly evaluate the ITP 2020 Study Cost Estimates. This is especially true in consideration of recent national events and additional difficulties/restrictions involved with working remotely from home." – Cliff Franklin

The PCWG was included in the discussion for awareness and to provide input. This group was not required to take action, but did not express critical concerns.

AGENDA ITEM 3 – CONSENT AGENDA

The consent agenda included the following items:

Meeting Minutes – February 26, 2020 (Attachment 5 – February 26 2020 ESWG Minutes)

Meeting Minutes – March 5, 2020 (Attachment 6 – March 5 2020 ESWG Minutes)

ITP Siting Manual (Attachment 7 – ITP Siting Manual)

The consent agenda was approved unanimously.

AGENDA ITEM 4 – REVIEW OF PAST ACTION ITEMS

Joshua Norton (SPP) reviewed past action items. (Attachment 8 – Past Action Items)

AGENDA ITEM 5 – ITP QUARTERLY REPORT

Sherri Maxey (SPP) presented the ITP quarterly report and Casey Cathey (SPP) discussed the 2020 ITP regional directional transfer target area. (Attachment 9 – ITP Quarterly Report)

AGENDA ITEM 6 – 2020 ITP ASSESSMENT

AGENDA ITEM 6A – DPP WINDOW REMINDER

Tammy Bright (SPP) gave some general DPP window reminders. (Attachment 10 – 2020 DPP Window and Submittals)

AGENDA ITEM 7 – 2021 ITP ASSESSMENT

AGENDA ITEM 7A – SCHEDULE

This item was not discussed.

AGENDA ITEM 7B – RESOURCE PLAN PHASE 2

Kirk Hall (SPP) reviewed the process of accreditation and showed preliminary shortfalls. (Attachment 11 – 2021 Renewable Accreditation Examples) (Attachment 12 – ITP Resource Planning Phase II)

AGENDA ITEM 7C – SITING PLAN

Joshua Norton (SPP) reviewed a high level schedule of the milestone. (Attachment 13 – Siting Plan)

AGENDA ITEM 8 – JANUARY 17TH, 2018 FERC REPORT AND RECOMMENDATIONS

Casey Cathey SPP) discussed the cold weather report and presented on its' recommendations. Some members expressed support for temperature-adjusted line ratings. (Attachment 14 – FERC NERC cold weather report)

AGENDA ITEM 9 – IPSAC DEBRIEF AND REVIEW OF THE CSP NEEDS

Neil Robertson (SPP) presented on the SPP-MISO CSP needs and schedule. (Attachment 15 – SPP-MISO IPSAC Needs)

AGENDA ITEM 10 – RR 403: CHANGE TO ITP OPERATIONAL MODEL DEVELOPMENT

Will Tootle (SPP) presented the current language for RR 403 and the group suggested edits to section 2.4. An updated document was sent out the group following the meeting and is attached. Although the proposed edits aimed to take out the requirement of economic operational solutions evaluation, the group expressed concerns with not having any kind of

mechanism to evaluate operational issues, primarily in situations where the planning models do not reflect persistent operational needs. The Revision Request will continue to be available for comments. (Attachment 16 – RR 403 Change to ITP Operational Model Development)

AGENDA ITEM 11 – ESWG AI 207: DISCOUNT RATE

Antonio Barber (SPP) reviewed background and analysis for the action item and presented a recommendation for the ESWG to endorse no change to the discount rate. (Attachment 17 – Action Item 207 Discount Rate)

> **Tim Owens made the motion, seconded by John Olsen, to endorse no change to the discount rate. The motion passed unanimously.**

AGENDA ITEM 12 – EPRI RISK-BASED PLANNING

Chris Jamieson (SPP) reviewed current activities, goals, and next steps revolving around risk-based planning. He discussed the EPRI case study as well. (Attachment 18 – Risk-based Planning)

AGENDA ITEM 13 – EMAIL VOTING PROCEDURES

Joshua Norton (SPP) presented some email voting procedures and asked for feedback. (Attachment 19 – Email Voting Procedure)

ECONOMIC STUDIES WORKING GROUP MINUTES

April 7-8, 2020

AGENDA ITEM 15 – CLOSING ITEMS

Alan Myers reviewed the ESWG items coming from the ESRSC. (Attachment 20 – ESRSC Update)

There were no action items taken.

Respectfully Submitted,

Joshua Norton

Secretary

Southwest Power Pool, Inc.

ECONOMIC STUDIES WORKING GROUP

Pending Action Items Status Report

May 7, 2020

#	Action Item	Date Originated	Status	Comments
183	SPP staff to perform transmission outage analysis in the first part of 2017 to determine the appropriate APC benefit percentage to utilize for the mitigation of transmission outages benefit metric.	September 15th, 2016	In Progress SPP Staff	ESWG Approved the methodology and staff to begin analysis. Staff to bring an update by the December ESWG meeting. Working with SPP operations on additional APC benefit with outages included.
190	SPP staff to perform a full transmission outage analysis before the next RCAR	October 12th, 2017	SPP Staff	Working with SPP operations on additional APC benefit with outages included.
~~196~~	~~From SSC: ESWG to look into including market to market payments/settlements in the ITP Planning Process~~	~~January 9th, 2019~~	~~In Progress~~ ~~SPP Staff~~ Closed	~~Staff presented an education session in February, bring additional information as available~~
199	How we inform our Siting Plan: Research the appropriateness of relying on the GI Queue for Siting of renewables and Battery Storage and looking into other available information	April 2019	SPP Staff	Goal: to complete and implement for the 2021 ITP Assessment Continue discussing the battery storage piece
201	Review the interchange methodology	July 2019	SPP Staff	Goal: To complete for the 2021 ITP Assessment
203	Conduct a Lessons Learned Session with the ESWG on the 2019 ITP Assessment	August 2019	SPP Staff	
206	MOPC Action Item: TWG and ESWG to develop approaches that address winter peaking and cold-weather driven reliability issues for incorporation in SPP's normal planning processes.	MOPC October 15-16, 2019	In Progress	

~~208~~	~~MOPC Action Item: ESWG and Staff to provide additional information, including input from the Strategic Planning Committee, to aid the MOPC in making a decision at the April 2020 meeting on the consolidation portion of the 2021 ITP Assessment Scope~~	~~MOPC January 14-15, 2020~~	~~In Progress~~ Closed	~~Heading to April MOPC~~

SPP Southwest Power Pool

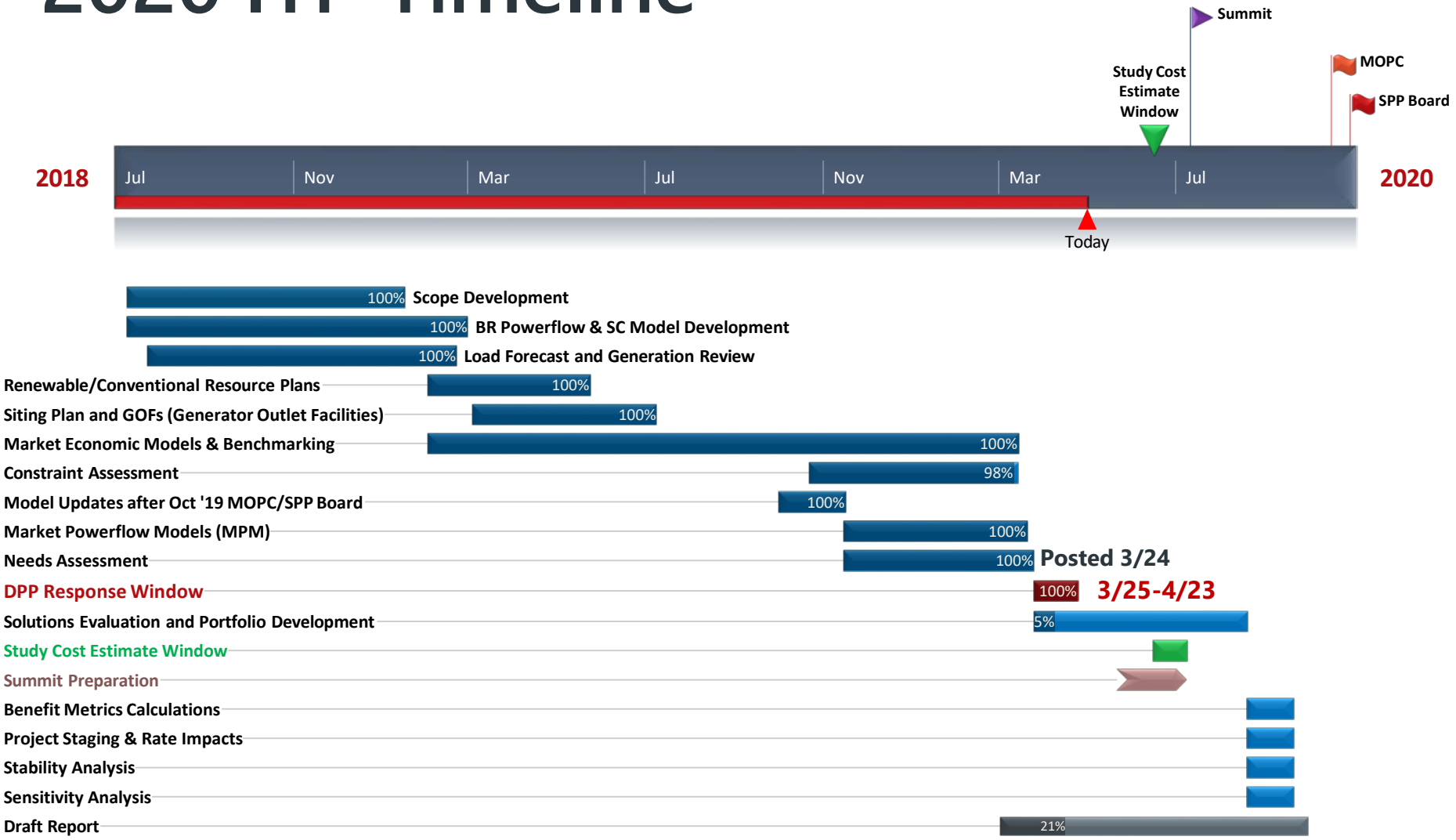
2020 ITP

2020 ITP SCHEDULE

SHERRI MAXEY

MAY 2020

2020 ITP Timeline



DPP WINDOW (COMPLETE)

- Start: 3/25/2020 12:00 a.m.
- End: 4/23/2020 11:59 p.m.
- Member Review Time:
  - Transmission-planning response window (30 calendar days)
    - Caveat: This start date is dependent upon the following milestones completing on time as scheduled:
      - MEM and Constraint Assessment re-approved by 3/13/2020
      - MPM re-approved by 3/19/2020
      - Completed needs assessments posted for reliability, short-circuit, economic, policy and consideration of persistent operational needs by 3/24/2020
- Staff Leader: Tammy Bright (tbright@spp.org)

SOLUTIONS DEVELOPMENT & TECHNICAL VALIDATION

- Start: 3/25/2020
- End: 6/01/2020

- Staff Leader: Kelsey Allen (kallen@spp.org)

SOLUTIONS EVALUATION

- Start: 4/13/2020
- End: 6/01/2020

- Staff Leaders:
  - Reliability: Neeya Toleman (ntoleman@spp.org)
  - Economic/Policy: Adam Bell (abell@spp.org)
  - Operational: Will Tootle (wtootle@spp.org)
  - Short Circuit: Jason Terhune (jterhune@spp.org)

RELIABILITY PORTFOLIO DEVELOPMENT

- Start: 6/01/2020
- End: 7/28/2020

- Staff Leaders: Liz Gephardt (lgephardt@spp.org)

ECONOMIC PORTFOLIO DEVELOPMENT (INCLUDES PROJECT GROUPING)

- Start: 6/01/2020
- End: 7/28/2020

- Staff Leader: Kelsey Allen (kallen@spp.org)

STUDY COST ESTIMATES – ROUND 1

- Start: 6/15/2020
- End: 7/07/2020

- Staff Leader: John O'Dell (jodell@spp.org)

PLANNING SUMMIT

- Start: 7/07/2020
- End: 7/08/2020
- Member Review Time:
  - Summit Materials to be provided prior to meeting
- Staff Leader: Tammy Bright (tbright@spp.org)

OPTIMIZATION & PORTFOLIO CONSOLIDATION

- Start: 7/29/2020
- End: 8/18/2020

- Staff Leaders:
  - Liz Gephardt (lgephardt@spp.org)
  - Joshua Pilgrim (jpilgrim@spp.org)

PROJECT STAGING

- Start: 8/19/2020
- End: 9/01/2020

- Staff Leader: Liz Gephardt (lgephardt@spp.org)

BENEFIT METRICS CALCULATION

- Start: 8/19/2020
- End: 9/18/2020

- Staff Leader: Antonio Barber (abarber@spp.org)

STABILITY ANALYSIS

- Start: 8/19/2020
- End: 9/18/2020

- Staff Leader: Joshua Pilgrim (jpilgrim@spp.org)

SENSITIVITY ANALYSIS

- Start: 8/19/2020
- End: 9/18/2020

- Staff Leader: James Bailey (jbailey@spp.org)

FINAL RELIABILITY ASSESSMENT

- Start: 8/19/2020
- End: 9/18/2020

- Staff Leader: Neeya Toleman (ntoleman@spp.org)

RATE IMPACTS/ATRR

- Start: 9/02/2020
- End: 9/18/2020

- Staff Leader: Antonio Barber (abarber@spp.org)

FINAL REPORT

- Start: 8/1/2020
- End: 9/28/2020
  - Final ESWG/TWG Approval in Sept. 2020
- Staff Leader: Tammy Bright (tbright@spp.org)

TWG/ESWG FINAL APPROVALS

- Start: 9/21/2020
- End: 10/2/2020

- Staff Leaders:
  - TWG – Adam Bell (abell@spp.org)
  - ESWG – Joshua Norton (jnorton@spp.org)

MOPC AND SPP BOARD

- MOPC: 10/13-14/2020
- SPP Board: 10/27/2020

- Member Review Time:
  - MOPC: 10/2/2020 – 10/12/2020 (6 days)
  - SPP Board: 10/20/2020 – 10/27/2020 (5 days)

SPP Southwest Power Pool

2021 ITP

2021 ITP SCHEDULE

SHERRI MAXEY

MAY 2020

SCOPE DEVELOPMENT – APPROVED PENDING ONE ITEM

- Start: 7/08/2019
- End: 1/14/2020 (Member's Final Approval)
  - *MOPC Approval: 1/14/2020*
  - *Final MOPC Review for Consolidation section: 4/15/2020*
  - Final MOPC Approval for Consolidation section: 7/15/2020
- Member Review Time:
  - *Stakeholder review: 12/03/2019 – 12/11/2019 (8 days)*
  - *Approved by ESWG: 12/11/2019*
  - *Stakeholder review: 12/10/2019 – 12/18/2019 (8 days)*
  - *Approved by TWG: 12/18/2019*
  - Stakeholder Review: 3/31/2020 – 4/07/2020 (5 days)
  - Approval by ESWG: 04/07/2020
- Staff Leader: Amber Greb (agreb@spp.org)
- Working Group Approvals: ESWG and TWG

BASE RELIABILITY (BR) POWERFLOW & SHORT CIRCUIT (SC) MODELS

- Start: 7/09/2019
- Initial Approval: 3/20/2020 *for BR Powerflow models*
- Initial Approval: TBD *for SC models*
- BR Powerflow & SC - Final Approval: 11/16/2020
- **Member Review Time:**
  - *Pass 0 – Trial 1: 7/22/2019 – 7/26/2019 (5 days) (complete) – BR Powerflow only*
  - *Pass 0 – Trial 2: 8/12/2019 – 8/30/2019 (15 days) (complete) – BR Powerflow only*
  - *Pass 1 – Trial 1: 9/30/2019 – 10/18/2019 (15 days) (complete) – BR Powerflow only*
  - *Pass 1 – Trial 1: 10/4/2019 – 10/18/2019 (10 days) (complete) – SC only*
  - *Pass 1 – Trial 2: 11/18/2019 – 12/13/2019 (20 days) (complete) – BR Powerflow & SC*
  - *Last Chance Data Submission Deadline: 12/13/2019* (complete)*
  - *Pass 2: 1/20/2020 – 2/07/2020 (15 days) (complete) – BR Powerflow & SC*
  - *Final Chance Data Submission Deadline: 2/07/2020** (complete)*
  - *Initial Final SC for approval: 3/23/2020 – 3/27/2020 (5 days) (complete) – SC only*
  - Initial Final BR Powerflow ITP: 3/09/2020 – 3/20/2020 (10 days) (complete) – Approved via email
  - Initial Final SC Approval: TBD
  - Final BR Powerflow & SC Approval with Oct. 2020 Board approved projects from 2020 ITP in Nov. 2020
- Staff Leader: David Duhart (dduhart@spp.org)
- Working Group Approval: TWG

** **Last Chance** - Data Submitters provide final Transmission Service Inputs (AG1) Data, review Pass 2 models/data submission through MOD, update load and generation reports/reconcile transaction discrepancies.*
*** **Final Chance** - Data Submitters submit final generation dispatch, DocuCheck corrections and topology data updates through MOD and EDST.*

LOAD REVIEW (COMPLETE)

- Start: 7/19/2019
- End: 3/13/2020 (Member's Final Approval)
- Member Review Time:
  - *Load Pass 1 – Trial 1: 9/30/2019 – 10/18/2019 (15 days)*
  - *Load Pass 1 – Trial 2: 11/18/2019 – 12/06/2019 (15 days)*
  - *Load Pass 2: 1/20/2020 – 1/24/2020 (5 days)*
  - *Final Posting for Approval: 3/06/2020*
  - *Final Load Pass – Stakeholder Review: 3/09/2020 – 3/13/2020 (5 days)*
  - *Final ESWG Approval requested via email: 3/13/2020*
- Staff Leader: Liz Gephardt (lgephardt@spp.org)
- Working Group Approval: ESWG

GENERATION REVIEW (COMPLETE)

- Start: 7/19/2019
- End: 3/13/2020 (Member's Final Approval)
- Member Review Time:
  - *Generation Pass 1 – Trial 1: 9/30/2019 – 10/18/2019 (15 days)*
  - *RAR & Waiver Request to Stakeholders: 9/30/2019 – 10/18/2019 (15 days)*
  - *Generation Pass 1 – Trial 2: 11/18/2019 – 12/06/2019 (15 days)*
  - *Generation Pass 2: 1/20/2020 – 1/24/2020 (5 days)*
  - *Final Posting for Approval: 3/06/2020*
  - *Final Generation Pass – Stakeholder Review: 3/09/2020 – 3/13/2020 (5 days)*
  - *Final ESWG Approval requested via email: 3/13/2020*
- Staff Leader: Liz Gephardt (lgephardt@spp.org)
- Working Group Approval: ESWG

RENEWABLE POLICY REVIEW (COMPLETE)

- Start: 1/07/2020
- End: 4/02/2020 (Member's Final Approval)
- Member Review Time:
  - Posting: 3/13/2020
  - Stakeholder Review: 3/16/2020 – 3/20/2020 (5 days)
  - Request ESWG Final Approval via email vote: 4/02/2020
- Staff Leader: Ahmed M. Al Azzawi (AAlAzzawi@spp.org)
- Working Group Approval: ESWG

RENEWABLE RESOURCE PLAN – PHASE 1 (COMPLETE)

- Start: 2/03/2020
- End: 4/02/2020 (Member's Final Approval)
- Member Review Time:
  - Posting: 3/13/2020 and updated 3/20/2020
  - Stakeholder Review: 3/16/2020 – 3/26/2020 (8 days)
  - ESWG Final Approval via email vote complete: 4/02/2020
- Staff Leader: Ahmed M. Al Azzawi (AAlAzzawi@spp.org)
- Working Group Approval: ESWG

RENEWABLE RESOURCE PLAN – PHASE 2

- Start: 2/03/2020
- End: 5/20/2020 (Member's Final Approval)
- Member Review Time:
  - Preliminary Results - Stakeholder Review: 4/03/2020 – 4/16/2020 (10 days)
  - Zonal Shortfalls - Stakeholder Review: 4/28/2020 – 5/05/2020 (5 days)
  - External Resource Plan – Stakeholder Review: 5/11/2020 – 5/15/2020 (5 days)
  - Final for ESWG Approval – Stakeholder Review: 5/11/2020 – 5/15/2020 (5 days)
  - Request ESWG approval via email vote: 5/15/2020
- Staff Leader: Kirk Hall (khall@spp.org)
- Working Group Approval: ESWG

SITING PLAN & GENERATOR OUTLET FACILITIES (GOFS)

- Start: 3/15/2020
- End: 7/09/2020 (Member's Final Approval)

- Staff Leaders:
  - Siting Plan: Joshua Norton (jnorton@spp.org)
  - GOFs: Brooke Keene (bkeene@spp.org)
- Working Group Approval: ESWG (Siting Plan)/TWG (GOFs)

MARKET ECONOMIC MODEL BUILD

- Start: 12/01/2019
- End: 12/10/2020 (Member's Initial Final Approval)

- Staff Leader: Charlton Hill (chill@spp.org)
- Working Group Approval: ESWG

MARKET ECONOMIC BENCHMARKING

- Start: 5/13/2020
- End: 7/18/2020 (Member's Final Approval)

- Staff Leader: Charlton Hill (chill@spp.org)
- Working Group Approval: ESWG

CONSTRAINT ASSESSMENT

- Start: 09/02/2020
- End: 12/10/2020 (Member's Final Approval)

- Staff Leader: James Bailey (jbailey@spp.org)
- Working Group Approval: TWG

MARKET POWERFLOW MODELS (MPM)

- Start: 10/18/2020
- End: 1/14/2021 (Member's Final Approval)

- Staff Leader: Michael Odom (modom@spp.org)
- Working Group Approval: TWG

NEEDS ASSESSMENT

- Start: 11/04/2020
- End: 3/08/2021

- Staff Leaders:
  - BR and MP Needs: Joshua Pilgrim (jpilgrim@spp.org)
  - Econ/Policy Needs: James Bailey (jbailey@spp.org)
  - Short-Circuit Needs: Nathan Bean (nbean@spp.org)
  - Operational Needs: Zachary Sharp (zsharp@spp.org)

DPP WINDOW (COMPLETE)

- Start: 3/09/2021 12:00 a.m.
- End: 4/07/2021 11:59 p.m.
- Member Review Time:
  - Transmission-planning response window (30 calendar days)
- Staff Leader: Tammy Bright (tbright@spp.org)

SOLUTIONS DEVELOPMENT & TECHNICAL VALIDATION

- Start: 3/09/2021
- End: 5/10/2021

- Staff Leader: Kirk Hall (khall@spp.org)

SOLUTIONS EVALUATION

- Start: 3/23/2021
- End: 6/03/2021

- Staff Leaders:
  - Reliability: Antonio Barber (abarber@spp.org)
  - Economic/Policy: Neeya Toleman (ntoleman@spp.org)
  - Operational: Zachary Sharp (zsharp@spp.org)
  - Short Circuit: Nathan Bean (nbean@spp.org)

RELIABILITY PORTFOLIO DEVELOPMENT

- Start: 5/27/2021
- End: 8/01/2021

- Staff Leaders: TBD

ECONOMIC PORTFOLIO DEVELOPMENT (INCLUDES PROJECT GROUPING)

- Start: 5/27/2021
- End: 8/01/2021

- Staff Leader: Ahmed M. Al Azzawi (AAlAzzawi@spp.org)

STUDY COST ESTIMATES – ROUND 1

- TBD

- Staff Leader: John O'Dell (jodell@spp.org)

PLANNING SUMMIT

- TBD
- Staff Leader: Tammy Bright (tbright@spp.org)

STUDY COST ESTIMATES – ROUND 2*

- TBD

- Staff Leader: John O'Dell (jodell@spp.org)

* Dates subject to change

OPTIMIZATION & PORTFOLIO CONSOLIDATION

- Start: 8/02/2021
- End: 8/22/2021

- Staff Leaders:
  - Ahmed M. Al Azzawi (AAlAzzawi@spp.org)
  - Jacob Pannell (jpannell@spp.org)

PROJECT STAGING

- Start: 8/23/2021
- End: 9/02/2021

- Staff Leader: TBD

BENEFIT METRICS CALCULATION

- Start: 8/23/2021
- End: 9/21/2021

- Staff Leader: TBD

STABILITY ANALYSIS

- Start: 8/23/2021
- End: 9/21/2021

- Staff Leader: Joshua Pilgrim (jpilgrim@spp.org)

SENSITIVITY ANALYSIS

- Start: 8/23/2021
- End: 9/21/2021

- Staff Leader: TBD

FINAL RELIABILITY ASSESSMENT

- Start: 8/23/2021
- End: 9/21/2021

- Staff Leader: Joshua Norton (jnorton@spp.org)

RATE IMPACTS/ATRR

- Start: 9/02/2021
- End: 9/16/2021

- Staff Leader: TBD

FINAL REPORT

- Start: 8/1/2021
- End: 10/01/2021
  - Final ESWG/TWG Approval in Sept. 2021
- Staff Leader: Tammy Bright (tbright@spp.org)

TWG/ESWG FINAL APPROVALS

- Start: 9/21/2021
- End: 10/01/2021

- Staff Leaders:
  - TWG – Adam Bell (abell@spp.org)
  - ESWG – Joshua Norton (jnorton@spp.org)

MOPC AND SPP BOARD

- MOPC: 10/12-13/2021
- SPP Board: 10/26/2021

2021 ITP Policy Resource Additions

SPS Update

05/07/2020

SPP – 2021 ITP POLICY RESOURCE ADDITIONS
Presented to CAWG

SHORTFALLS BY UTILITY BY STATE

		Future 1		Future 2			
		Capacity Shortfall (MW)					
Utility	Renewable Type	2025	2030	2025	2030	Capacity Factor	Mandate/Goal Information
Kansas Municipal Energy Agency	Wind	14.2	16.3	14.2	16.3	46.1%	KS Capacity Goal
Kansas Municipal Energy Agency	Solar	6.1	7.0	6.1	7.0	22.6%	KS Capacity Goal
MOPEP	Wind	11.2	11.9	11.2	12.3	44.4%	MO Energy Mandate
MOPEP	Solar	4.8	5.1	4.8	5.3	20.3%	MO Energy Mandate
Sunflower Electric Power Corp.	Wind	6.7	7.6	6.7	7.6	46.1%	KS Capacity Goal
Sunflower Electric Power Corp.	Solar	2.9	3.3	2.9	3.3	22.6%	KS Capacity Goal
Southwestern Public Service Company	Wind	770.4	1171.9	773.8	1195.9	41.9%	NM Energy Mandate
Southwestern Public Service Company	Solar	330.2	502.2	331.6	512.5	23.4%	NM Energy Mandate
Subtotal	Wind	802.5	1207.6	806.0	1232.0		
Subtotal	Solar	343.9	517.6	345.4	528.0		
Total	**Both**	**1146.5**	**1725.2**	**1151.5**	**1760.1**		

Note: The 2025 and 2030 dates shown above should be 2026 and 2031

SPS Position – Initial Position

Summary on slide 2

Description	2026 (MWh)	2031 (MWh)
NM RPS Requirement	**5,333,544**	**7,157,405**
NM LRS REC Generation		
Wind	1,728,602	1,728,602
Solar	104,651	104,651
Total	**1,833,254**	**1,833,254**
REC / Energy Need	**3,500,290**	**5,324,152**

Description	C.F	2026 (MWh)	2031 (MWh)	2026 (MW)	2031 (MW)
Wind (70%)	41.86%	2,824,905	4,296,851	770.4	1,171.9
Solar (30%)	23.35%	675,384	1,027,300	330.2	502.2
Total		**3,500,290**	**5,324,152**	**1,100.6**	**1,674.1**

SPS – Proposed RP1 Results and Calculations*

Description	2026 (MWh)	2031 (MWh)
NM RPS Requirement	**5,333,544**	**7,157,405**
NM LRS REC Generation		
Wind	3,994,066	3,444,118
Solar	238,654	238,654
Total	**4,232,720**	**3,682,772**
REC / Energy Need	**1,100,824**	**3,474,633**

Description	C.F	2026 (MWh)	2031 (MWh)	2026 (MW)	2031 (MW)
Wind (70%)	41.86%	888,419	2,804,199	242.3	764.8
Solar (30%)	23.35%	212,405	670,434	103.8	327.8
Total		**1,100,824**	**3,474,633**	**346.1**	**1,092.5**

**Only future 1 results displayed*

** File for both futures is located on GlobalScape for review*

Requesting approval of new RP1 Results for SPS


Xcel Energy®

SPP Southwest Power Pool

2021 **ITP**

2021 ITP RP2

KIRK HALL

OBJECTIVE

- Review Allocation of conventional resources
- Discuss Exceptions
- ~~Approve the 2021 ITP Resource Plan~~

INPUTS

		YEAR 2	REFERENCE CASE YEAR 5	REFERENCE CASE YEAR 10	EMERGING TECHNOLOGIES YEAR 5	EMERGING TECHNOLOGIES YEAR 10
TOTAL RENEWABLE CAPACITY (GW)						
Solar (GW)	Existing + RARs		6	9	7	11
Wind (GW)	Existing + RARs		29	32	33	37
Storage	None		20% of projected solar		35% of projected solar	

GENERATION TYPE	DATA SOURCE	TECH TYPE	SIZE (MW)	TOTAL CAPITAL COST ($/KW)	V O&M ($/MWH)	F O&M ($/KW-YR)	HEAT RATE (BTU/KWH)
Combined Cycle* (CC)	EIA AEO'19	Conv.	702	999	3.61	11.33	6,600
Combustion Turbine (CT)	EIA AEO'19	Adv.	237	691	11.02	7.01	9,800

*Only allowed by exception requests

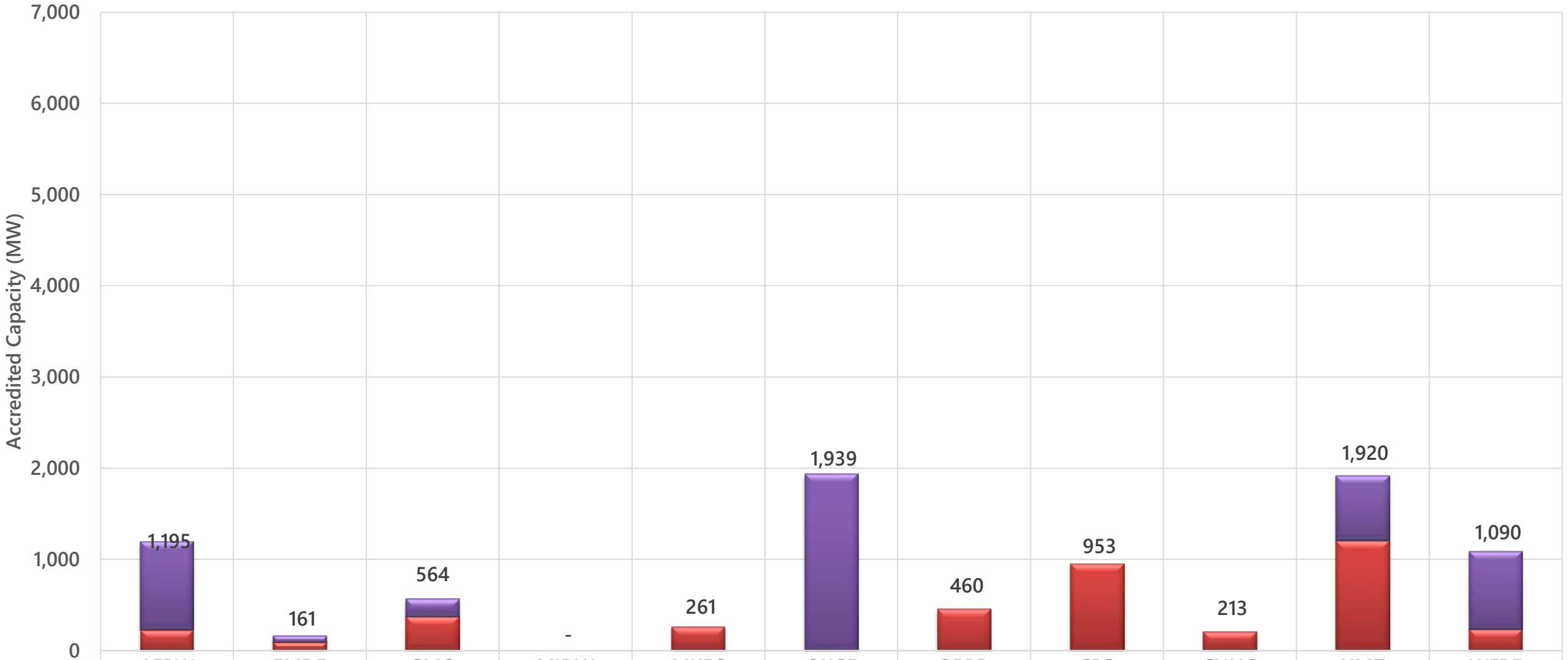
REGIONAL CT ADDITIONS & INITIAL OBSERVATIONS

	Future 1		Future 2	
	CC	CT	CC	CT
2026	0	20 (7)	0	45 (28)
2031	0	17 (8)	0	23 (12)
Total	0	37 (15)	0	68 (40)

- Retirement assumptions combined with the limited exceptions in F2 may be adversely affecting the conventional resource plans
- ELCC has greatly reduced the amount of additional wind provided from the scope-defined wind additions

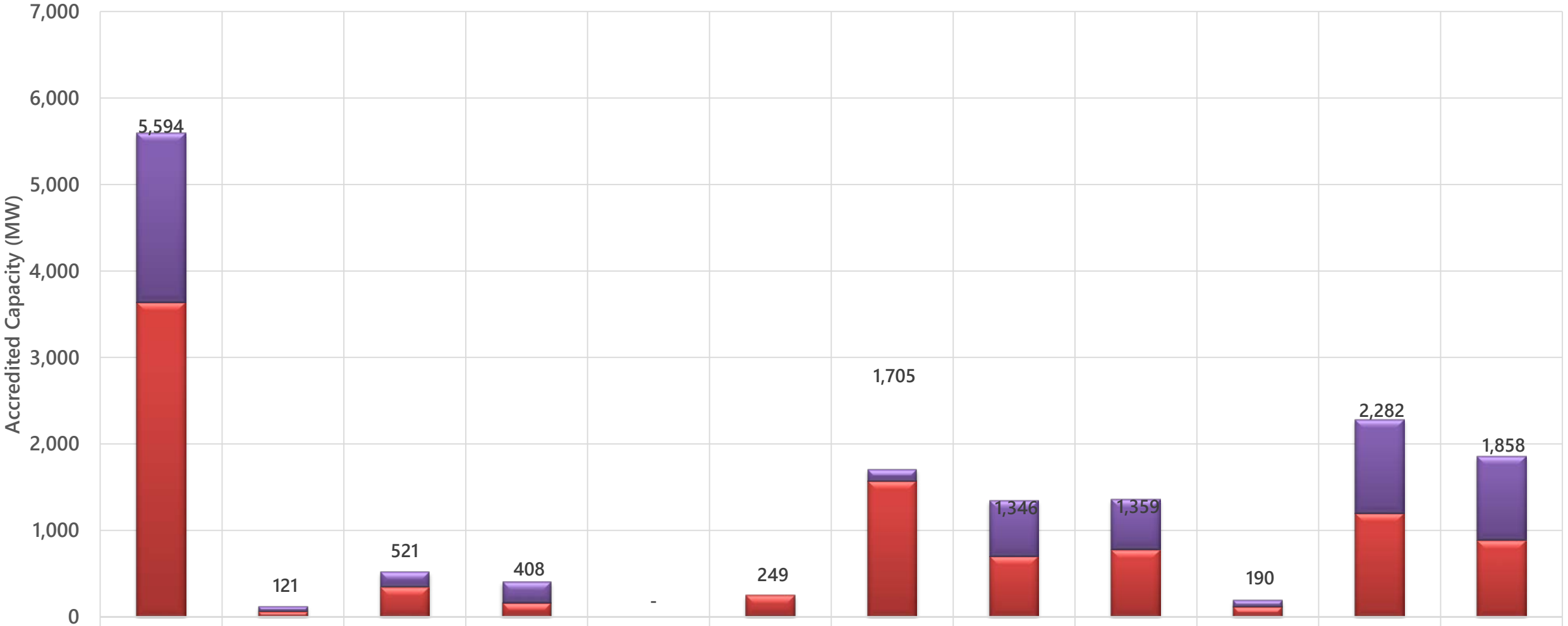
Note: Initial 2020 ITP additions in parenthesis

Cumulative Future 1 Conventional Additions by Zone



	AEPW	EMDE	GMO	MIDW	MKEC	OKGE	OPPD	SPS	SUNC	UMZ	WERE
2031	968	71	190	0	0	1939	0	0	0	711	853
2026	228	90	374	0	261	0	460	953	213	1209	237

Cumulative Future 2 Conventional Additions by Zone



	AEPW	EMDE	GMO	KCPL	MIDW	MKEC	OKGE	OPPD	SPS	SUNC	UMZ	WERE
2031	1954	59	173	249	0	0	133	647	581	71	1085	972
2026	3640	62	348	159	0	249	1572	699	778	119	1197	886

Column Name	Description
Zone	Pricing Zone
Existing Conventional	Summation of Existing Conventional Accredited Capacity Source: 2021 ITP Generation Review.
Existing Solar	Summation of Existing Solar Accredited Capacity Source: 2021 ITP Generation Review.
Existing Wind	Summation of Existing Wind Accredited Capacity Source: 2021 ITP Generation Review.
Existing DC Ties & PPAs	Summation of Fleet PPAs's/DC Ties From 'Fleet PPAs and DC Ties. Summation of the "Capacity Accreditation" (PPA Source Capacity (MW) minus from PPA Sink Capacity (MW)) Source: 2021 ITP Generation Review
New Solar	Summation of Policy Solar (RP1) & New Solar Accredited Capacity From Renewable Allocation Results
New Wind	Summation of Policy Wind (RP1) & New Wind Accredited Capacity From Renewable Allocation Results
New Energy Storage	Summation of New Energy Storage Accredited Capacity From Renewable Allocation Results
Total Existing Pre Allocation	Summation of Existing Conventional, Existing Solar, Existing Wind, Existing DC Ties & PPAs
Summer Peak Demand	Summation of Peak Load with losses Source: 2021 ITP Load Review
PPA Obligations	Summation of Fleet PPAs's/DC Ties From 'Fleet PPAs and DC Ties. Summation of the "Load Obligation / Load Reduction" (PPA Source Capacity (MW) minus from PPA Sink Capacity (MW)) Source: 2021 ITP Generation Review
Summer Load Obligation	Summation of Peak Load and "Load Obligation / Load Reduction" (PPA's/DC Ties) (PPA Source Capacity (MW) minus from PPA Sink Capacity (MW)) Source: 2021 ITP Generation Review
Summer Load Obligation + 12% Reserve Margin	Summation of Summer Load Obligation + 12% Reserve Margin
Capacity Shortfall Post-Renewable Allocation	Summer Load Obligation + 12% Reserve Margin minus from Summation of (New Solar, New Wind, New Energy Storage, and Existing)
New Conventional	Summation of New Conventional Units (MW)

Future 1 2026 Accredited Capacity (MW)

Zone	Existing Conv.	Existing Solar	Existing Wind	Existing DC Ties & PPAs	New Solar	New Wind	New Energy Storage	Total Existing Pre Allocation	Capacity Deficit	Summer Peak Demand	PPA Obligations	Summer Load Obligation	Summer Load Obligation + 12% Reserve Margin	Remaining Capacity Shortfall	New Conv.
AEPW	10,524	0	485	458	624	24	342	11,467	1,738	11,790	0	11,790	13,205	748	924
EMDE	1,078	0	81	0	64	0	35	1,159	193	1,211	(4)	1,207	1,352	94	152
GMO	1,297	2	144	0	117	26	63	1,443	592	2,157	(340)	1,817	2,035	386	453
GRDA	2,602	0	53	(453)	94	0	0	2,203	0	1,784	0	1,784	1,998	0	0
KACY	521	0	50	39	29	0	0	610	5	549	0	549	614	0	0
KCPL	4,675	0	375	42	216	3	0	5,092	0	3,998	349	4,347	4,869	0	0
LES	756	0	90	0	41	0	0	846	0	779	(187)	592	663	0	0
MIDW	261	0	45	6	23	24	12	313	153	430	(15)	416	465	94	107
MKEC	196	0	31	38	16	24	9	265	74	303	0	303	339	25	38
NPPD	3,954	0	102	(23)	210	0	0	4,032	0	3,962	(610)	3,351	3,754	0	0
OKGE	7,053	0	128	360	368	0	0	7,542	243	6,963	(12)	6,951	7,785	0	0
OPPD	2,284	0	164	0	157	24	86	2,448	748	2,958	(105)	2,853	3,196	482	486
SPRM	821	0	78	55	38	0	0	955	0	719	46	765	857	0	0
SPS	5,346	103	491	50	599	178	202	5,991	1,798	6,955	0	6,955	7,789	724	735
SUNC	528	0	14	17	59	25	31	559	533	1,081	(106)	975	1,092	417	436
SWPA	2,682	6	0	(1,735)	36	0	0	953	0	685	(59)	626	702	0	0
UMZ	7,088	0	427	0	375	24	206	7,515	1,827	7,087	1,254	8,341	9,341	1,222	1,410
WERE	5,673	0	837	166	332	2	182	6,676	517	6,282	141	6,422	7,193	0	0
WFEC	1,702	18	186	410	96	0	0	2,316	0	1,816	20	1,836	2,057	0	0
Total	59,042	128	3,782	(570)	3,496	351	1,169	62,383	8,420	61,508.3	371	61,879	69,305	4,192	4,740

Future 1 2031 Accredited Capacity (MW)

Zone	Existing Conv.	Existing Solar	Existing Wind	Existing DC Ties & PPAs	New Solar	New Wind	New Energy Storage	Total Existing Pre Allocation	Capacity Deficit	Summer Peak Demand	PPA Obligations	Summer Load Obligation	Summer Load Obligation + 12% Reserve Margin	Remaining Capacity Shortfall	New Conv.
AEPW	10,055	0	452	416	854	51	414	10,923	2,537	12,018	0	12,018	13,460	1,220	1,254
EMDE	1,078	0	30	0	89	0	43	1,108	283	1,246	(4)	1,242	1,391	152	152
GMO	1,108	2	144	0	162	53	77	1,254	861	2,228	(340)	1,888	2,115	569	571
GRDA	2,602	0	53	(453)	127	0	0	2,203	0	1,785	0	1,785	1,999	0	0
KACY	521	0	50	39	38	0	0	610	0	537	0	537	601	0	0
KCPL	4,295	0	375	42	291	3	0	4,712	195	4,033	348	4,382	4,908	0	0
LES	756	0	90	0	56	0	0	846	0	791	(187)	604	677	0	0
MIDW	261	0	45	6	32	37	16	313	180	456	(16)	440	493	95	107
MKEC	179	0	31	38	22	26	11	248	96	307	0	307	344	37	38
NPPD	3,931	0	102	(23)	288	0	0	4,009	0	4,054	(542)	3,512	3,933	0	0
OKGE	4,901	0	90	370	517	51	251	5,361	2,784	7,285	(12)	7,273	8,145	1,966	1,979
OPPD	2,284	0	164	0	213	51	103	2,448	794	3,000	(105)	2,895	3,242	428	486
SPRM	637	0	78	55	51	13	25	771	88	719	48	767	859	0	0
SPS	5,346	103	380	50	867	285	250	5,880	2,244	7,253	0	7,253	8,123	747	747
SUNC	468	0	14	17	80	52	38	499	604	1,094	(109)	985	1,103	434	436
SWPA	2,682	6	0	(1,735)	50	0	0	953	0	699	(62)	637	714	0	0
UMZ	6,769	0	427	0	543	51	263	7,196	2,767	7,641	1,254	8,895	9,963	1,911	1,920
WERE	4,757	0	837	166	454	51	220	5,760	1,568	6,398	146	6,544	7,329	843	844
WFEC	1,702	18	186	410	133	0	0	2,316	0	1,877	20	1,897	2,125	0	0
Total	54,333	128	3,549	(602)	4,867	722	1,708	57,409	15,002	63,421	439	63,860	71,523	8,401	8,532

Future 2 2026 Accredited Capacity (MW)

Zone	Existing Conv.	Existing Solar	Existing Wind	Existing DC Ties & PPAs	New Solar	New Wind	New Energy Storage	Total Existing Pre Allocation	Capacity Deficit	Summer Peak Demand	PPA Obligations	Summer Load Obligation	Summer Load Obligation + 12% Reserve Margin	Remaining Capacity Shortfall	New Conv.
AEPW	6,775	0	485	458	721	54	517	7,718	5,487	11,790	0	11,790	13,205	4,196	4,221
EMDE	1,078	0	81	0	74	0	53	1,159	193	1,211	(4)	1,207	1,352	66	116
GMO	1,237	2	144	0	135	56	94	1,383	652	2,157	(340)	1,817	2,035	366	403
GRDA	2,602	0	53	(453)	109	0	0	2,203	0	1,784	0	1,784	1,998	0	0
KACY	521	0	50	39	34	0	0	610	5	549	0	549	614	0	0
KCPL	3,787	0	375	42	249	57	175	4,204	664	3,998	349	4,347	4,869	184	192
LES	756	0	90	0	48	0	0	846	0	779	(187)	592	663	0	0
MIDW	261	0	45	6	26	31	19	313	153	430	(15)	416	465	77	83
MKEC	196	0	31	38	18	23	13	265	74	303	0	303	339	19	36
NPPD	3,420	0	102	(23)	242	0	12	3,499	254	3,962	(610)	3,351	3,754	0	0
OKGE	4,901	0	128	360	426	54	305	5,389	2,396	6,963	(12)	6,951	7,785	1,611	1,612
OPPD	1,994	0	164	0	181	54	130	2,158	1,037	2,958	(105)	2,853	3,196	673	711
SPRM	821	0	78	55	44	0	0	955	0	719	46	765	857	0	0
SPS	5,346	103	491	50	657	209	305	5,991	1,798	6,955	0	6,955	7,789	532	566
SUNC	528	0	14	17	68	55	47	559	533	1,081	(106)	975	1,092	362	403
SWPA	2,682	6	0	(1,735)	42	0	0	953	0	685	(59)	626	702	0	0
UMZ	6,880	0	427	0	433	54	310	7,307	2,035	7,087	1,254	8,341	9,341	1,237	1,422
WERE	4,826	0	837	166	384	54	275	5,829	1,364	6,282	141	6,422	7,193	650	664
WFEC	1,702	18	186	410	111	0	0	2,316	0	1,816	20	1,836	2,057	0	0
Total	50,315	128	3,782	(570)	4,002	702	2,256	53,656	16,645	61,508	371	61,879	69,305	9,971	10,428

Future 2 2031 Accredited Capacity (MW)

Zone	Existing Conv.	Existing Solar	Existing Wind	Existing DC Ties & PPAs	New Solar	New Wind	New Energy Storage	Total Existing Pre Allocation	Capacity Deficit	Summer Peak Demand	PPA Obligations	Summer Load Obligation	Summer Load Obligation + 12% Reserve Margin	Remaining Capacity Shortfall	New Conv.
AEPW	5,265	0	452	416	919	81	687	6,133	7,327	12,018	0	12,018	13,460	5,641	5,643
EMDE	1,078	0	30	0	95	0	71	1,108	283	1,246	(4)	1,242	1,391	116	119
GMO	1,050	2	144	0	174	83	127	1,197	919	2,228	(340)	1,888	2,115	534	534
GRDA	2,602	0	53	(453)	136	0	0	2,203	0	1,785	0	1,785	1,999	0	0
KACY	521	0	50	39	41	0	0	610	0	537	0	537	601	0	0
KCPL	3,434	0	375	42	313	84	231	3,851	1,056	4,033	348	4,382	4,908	428	429
LES	652	0	90	0	60	0	0	742	0	791	(187)	604	677	0	0
MIDW	215	0	45	6	35	27	26	266	226	456	(16)	440	493	139	140
MKEC	179	0	31	38	23	19	18	248	96	307	0	307	344	36	36
NPPD	2,791	0	102	(23)	310	81	232	2,870	1,063	4,054	(542)	3,512	3,933	441	474
OKGE	4,901	0	90	370	557	81	417	5,361	2,784	7,285	(12)	7,273	8,145	1,730	1,754
OPPD	1,231	0	164	0	229	81	172	1,394	1,848	3,000	(105)	2,895	3,242	1,366	1,422
SPRM	533	0	78	55	55	51	41	667	192	719	48	767	859	45	46
SPS	4,665	103	380	50	913	320	415	5,199	2,925	7,253	0	7,253	8,123	1,181	1,135
SUNC	468	0	14	17	86	57	63	499	604	1,094	(109)	985	1,103	398	403
SWPA	2,682	6	0	(1,735)	53	0	0	953	0	699	(62)	637	714	0	0
UMZ	6,119	0	427	0	584	81	437	6,546	3,416	7,641	1,254	8,895	9,963	2,315	2,370
WERE	3,782	0	837	166	489	81	366	4,786	2,543	6,398	146	6,544	7,329	1,608	1,612
WFEC	1,702	18	186	410	143	0	0	2,316	0	1,877	20	1,897	2,125	0	0
Total	43,872	128	3,549	(602)	5,218	1,125	3,302	46,948	25,283	63,421	439	63,860	71,523	15,977	16,116

GUIDELINES FOR DEVELOPING THE RESOURCE PLAN

- Identify minimum CT needs for each zone for Years 5 and 10
  - Round down for CTs assigned 100% for each zone
  - For Y5, consider assigning full CT to a zone based upon Y10 needs
- Any remaining zones that do not meet reserve margins may be receive joint owned units
  - Zones grouped together in 4 sub-regions for joint ownership purposes (IS, SPP South, KSMO, Nebraska
  - Assign ownership of individual CTs focusing on each subregion's needs
  - If Year 5, consider assigning zones additional ownership above minimum requirements based upon Y10 needs
  - If necessary assign joint ownership outside of a subregion based upon 1st tier Powerflow area connections
- Goal is to minimize need for additional units above minimum requirements for each scenario

F1 Y5 CONVENTIONAL ADDITIONS OWNERSHIP

Unit	Type	Zone	Cap (MW)	Study Year In-Service	Owner 1 (Siting Zone)	Owner 1% share	Owner 2	Owner 2% share	Owner 3	Owner 3% share
CT #1	CT	AEPW	237	2026	AEPW	100%				
CT #2	CT	AEPW	237	2026	AEPW	100%				
CT #3	CT	AEPW	237	2026	AEPW	100%				
CT #4	CT	SPS	237	2026	SPS	100%				
CT #5	CT	SPS	237	2026	SPS	100%				
CT #6	CT	SPS	237	2026	SPS	100%				
CT #7	CT	GMO	237	2026	GMO	100%				
CT #8	CT	SUNC	237	2026	SUNC	100%				
CT #9	CT	OPPD	237	2026	OPPD	100%				
CT #10	CT	OPPD	237	2026	OPPD	100%				
CT #11	CT	UMZ	237	2026	UMZ	100%				
CT #12	CT	UMZ	237	2026	UMZ	100%				
CT #13	CT	UMZ	237	2026	UMZ	100%				
CT #14	CT	UMZ	237	2026	UMZ	100%				
CT #15	CT	UMZ	237	2026	UMZ	100%				
CT #16	CT	AEPW	237	2026	AEPW	90%	SPS	10%		
CT #17	CT	UMZ	237	2026	UMZ	95%	OPPD	5%		
CT #18	CT	SUNC	237	2026	SUNC	85%	MKEC	15%		
CT #19	CT	GMO	237	2026	GMO	41%	EMDE	34%	MIDW	25%
CT #20	CT	GMO	237	2026	GMO	50%	EMDE	30%	MIDW	20%

F1 Y10 CONVENTIONAL ADDITIONS OWNERSHIP

Unit	Type	Zone	Cap (MW)	Study Year In-Service	Owner 1 (Siting Zone)	Owner 1% share	Owner 2	Owner 2% share	Owner 3	Owner 3% share	Owner 4	Owner 4% share
CT #21	CT	AEPW	237	2031	AEPW	100%						
CT #22	CT	OKGE	237	2031	OKGE	100%						
CT #23	CT	OKGE	237	2031	OKGE	100%						
CT #24	CT	OKGE	237	2031	OKGE	100%						
CT #25	CT	OKGE	237	2031	OKGE	100%						
CT #26	CT	OKGE	237	2031	OKGE	100%						
CT #27	CT	OKGE	237	2031	OKGE	100%						
CT #28	CT	OKGE	237	2031	OKGE	100%						
CT #29	CT	OKGE	237	2031	OKGE	100%						
CT #30	CT	OKGE	237	2031	OKGE	100%						
CT #31	CT	WERE	237	2031	WERE	100%						
CT #32	CT	WERE	237	2031	WERE	100%						
CT #33	CT	WERE	237	2031	WERE	100%						
CT #34	CT	UMZ	237	2031	UMZ	100%						
CT #35	CT	UMZ	237	2031	UMZ	100%						
CT #36	CT	AEPW	237	2031	AEPW	39%	OKGE	35%	WERE	21%	SPS	5%
CT #37	CT	GMO	237	2031	GMO	50%	WERE	35%	UMZ	15%		

F2 Y5 CONVENTIONAL ADDITIONS OWNERSHIP (1/2)

Unit	Type	Zone	Cap (MW)	Study Year In-Service	Owner 1 (Siting Zone)	Owner 1% share	Owner 2	Owner 2% share	Owner 3	Owner 3% share	Owner4	Owner4 % share
CT #1	CT	AEPW	237	2026	AEPW	100%						
CT #2	CT	AEPW	237	2026	AEPW	100%						
CT #3	CT	AEPW	237	2026	AEPW	100%						
CT #4	CT	AEPW	237	2026	AEPW	100%						
CT #5	CT	AEPW	237	2026	AEPW	100%						
CT #6	CT	AEPW	237	2026	AEPW	100%						
CT #7	CT	AEPW	237	2026	AEPW	100%						
CT #8	CT	AEPW	237	2026	AEPW	100%						
CT #9	CT	AEPW	237	2026	AEPW	100%						
CT #10	CT	AEPW	237	2026	AEPW	100%						
CT #11	CT	AEPW	237	2026	AEPW	100%						
CT #12	CT	AEPW	237	2026	AEPW	100%						
CT #13	CT	AEPW	237	2026	AEPW	100%						
CT #14	CT	AEPW	237	2026	AEPW	100%						
CT #15	CT	AEPW	237	2026	AEPW	100%						
CT #16	CT	AEPW	237	2026	AEPW	100%						
CT #17	CT	AEPW	237	2026	AEPW	100%						
CT #18	CT	OKGE	237	2026	OKGE	100%						
CT #19	CT	OKGE	237	2026	OKGE	100%						
CT #20	CT	OKGE	237	2026	OKGE	100%						
CT #21	CT	OKGE	237	2026	OKGE	100%						
CT #22	CT	OKGE	237	2026	OKGE	100%						
CT #23	CT	OKGE	237	2026	OKGE	100%						
CT #24	CT	SPS	237	2026	SPS	100%						
CT #25	CT	SPS	237	2026	SPS	100%						

F2 Y5 CONVENTIONAL ADDITIONS OWNERSHIP (2/2)

Unit	Type	Zone	Cap (MW)	Study Year In-Service	Owner 1 (Siting Zone)	Owner 1% share	Owner 2	Owner 2% share	Owner 3	Owner 3% share
CT #26	CT	GMO	237	2026	GMO	100%				
CT #27	CT	SUNC	237	2026	SUNC	100%				
CT #28	CT	WERE	237	2026	WERE	100%				
CT #29	CT	WERE	237	2026	WERE	100%				
CT #30	CT	OPPD	237	2026	OPPD	100%				
CT #31	CT	OPPD	237	2026	OPPD	100%				
CT #32	CT	UMZ	237	2026	UMZ	100%				
CT #33	CT	UMZ	237	2026	UMZ	100%				
CT #34	CT	UMZ	237	2026	UMZ	100%				
CT #35	CT	UMZ	237	2026	UMZ	100%				
CT #36	CT	UMZ	237	2026	UMZ	100%				
CT #37	CT	UMZ	237	2026	UMZ	100%				
CT #38	CT	WERE	237	2026	WERE	65%	OKGE	20%	MIDW	15%
CT #39	CT	AEPW	237	2026	AEPW	81%	SPS	19%		
CT #40	CT	OKGE	237	2026	OKGE	60%	SPS	40%		
CT #41	CT	OPPD	237	2026	OPPD	84%	KCPL	16%		
CT #42	CT	SUNC	237	2026	SUNC	68%	MIDW	21%	MKEC	11%
CT #43	CT	GMO	237	2026	GMO	71%	EMDE	29%		
CT #44	CT	KCPL	237	2026	KCPL	65%	EMDE	20%	WERE	15%

F2 Y10 CONVENTIONAL ADDITIONS OWNERSHIP

Unit	Type	Zone	Cap (MW)	Study Year In-Service	Owner 1 (Siting Zone)	Owner 1% share	Owner 2	Owner 2% share	Owner 3	Owner 3% share	Owner4	Owner4 % share
CT #45	CT	AEPW	237	2031	AEPW	100%						
CT #46	CT	AEPW	237	2031	AEPW	100%						
CT #47	CT	AEPW	237	2031	AEPW	100%						
CT #48	CT	AEPW	237	2031	AEPW	100%						
CT #49	CT	AEPW	237	2031	AEPW	100%						
CT #50	CT	AEPW	237	2031	AEPW	100%						
CT #51	CT	SPS	237	2031	SPS	100%						
CT #52	CT	SPS	237	2031	SPS	100%						
CT #53	CT	KCPL	237	2031	KCPL	100%						
CT #54	CT	WERE	237	2031	WERE	100%						
CT #55	CT	WERE	237	2031	WERE	100%						
CT #56	CT	WERE	237	2031	WERE	100%						
CT #57	CT	WERE	237	2031	WERE	100%						
CT #58	CT	NPPD	237	2031	NPPD	100%						
CT #59	CT	NPPD	237	2031	NPPD	100%						
CT #60	CT	OPPD	237	2031	OPPD	100%						
CT #61	CT	OPPD	237	2031	OPPD	100%						
CT #62	CT	OPPD	237	2031	OPPD	100%						
CT #63	CT	UMZ	237	2031	UMZ	100%						
CT #64	CT	UMZ	237	2031	UMZ	100%						
CT #65	CT	UMZ	237	2031	UMZ	100%						
CT #66	CT	UMZ	237	2031	UMZ	100%						
CT #67	CT	OKGE	237	2031	OKGE	51%	SPS	45%	MKEC	4%		
CT #68	CT	GMO	237	2031	GMO	56%	MIDW	24%	SPRM	20%	EMDE	1%

EXCEPTION REQUESTS INFORMATION AND PLACEHOLDER

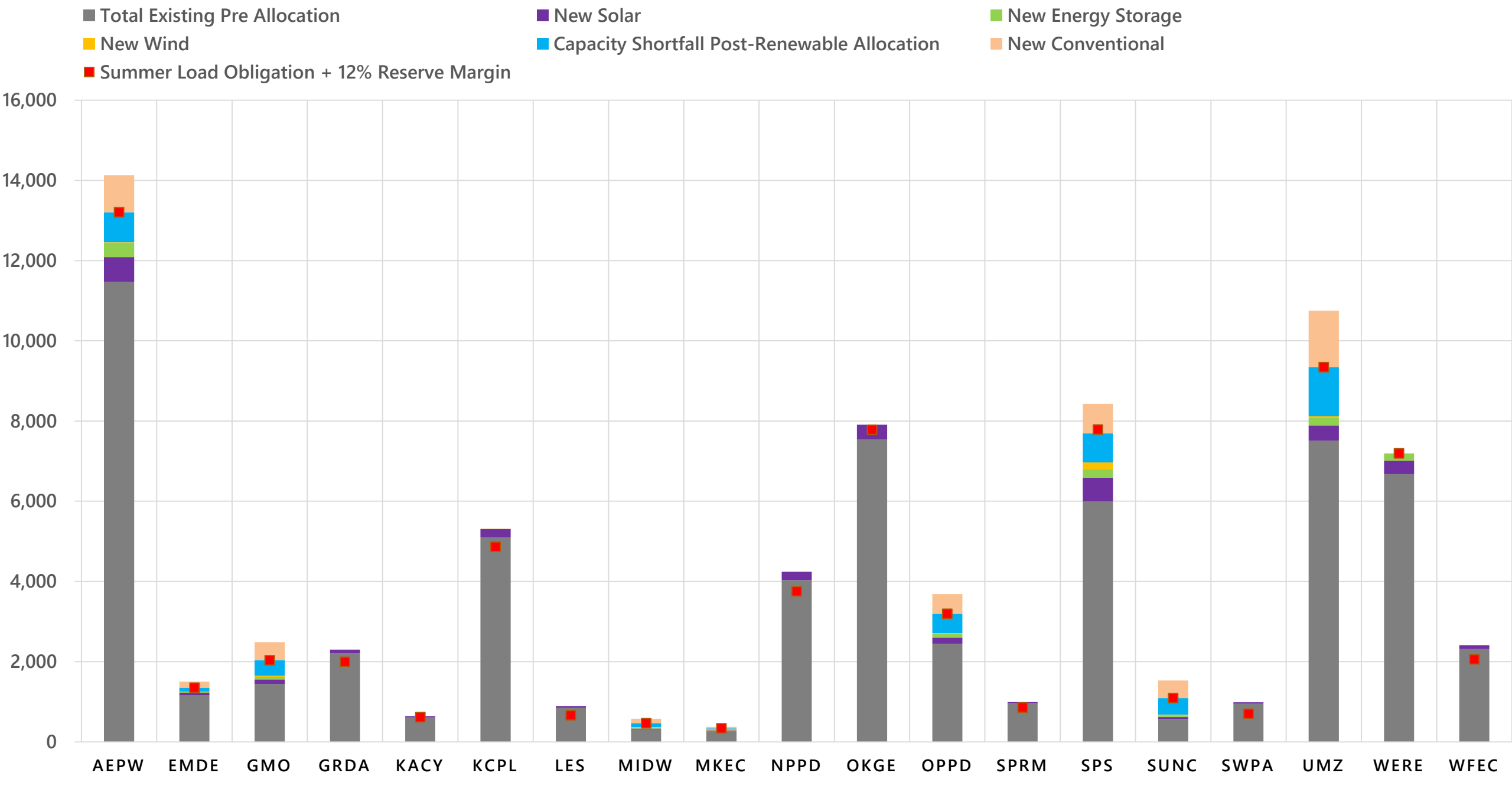
- Exception requests received by 3 member to date
  - AEP, SPS, and OKGE

RP2 APPROVAL DELAYED

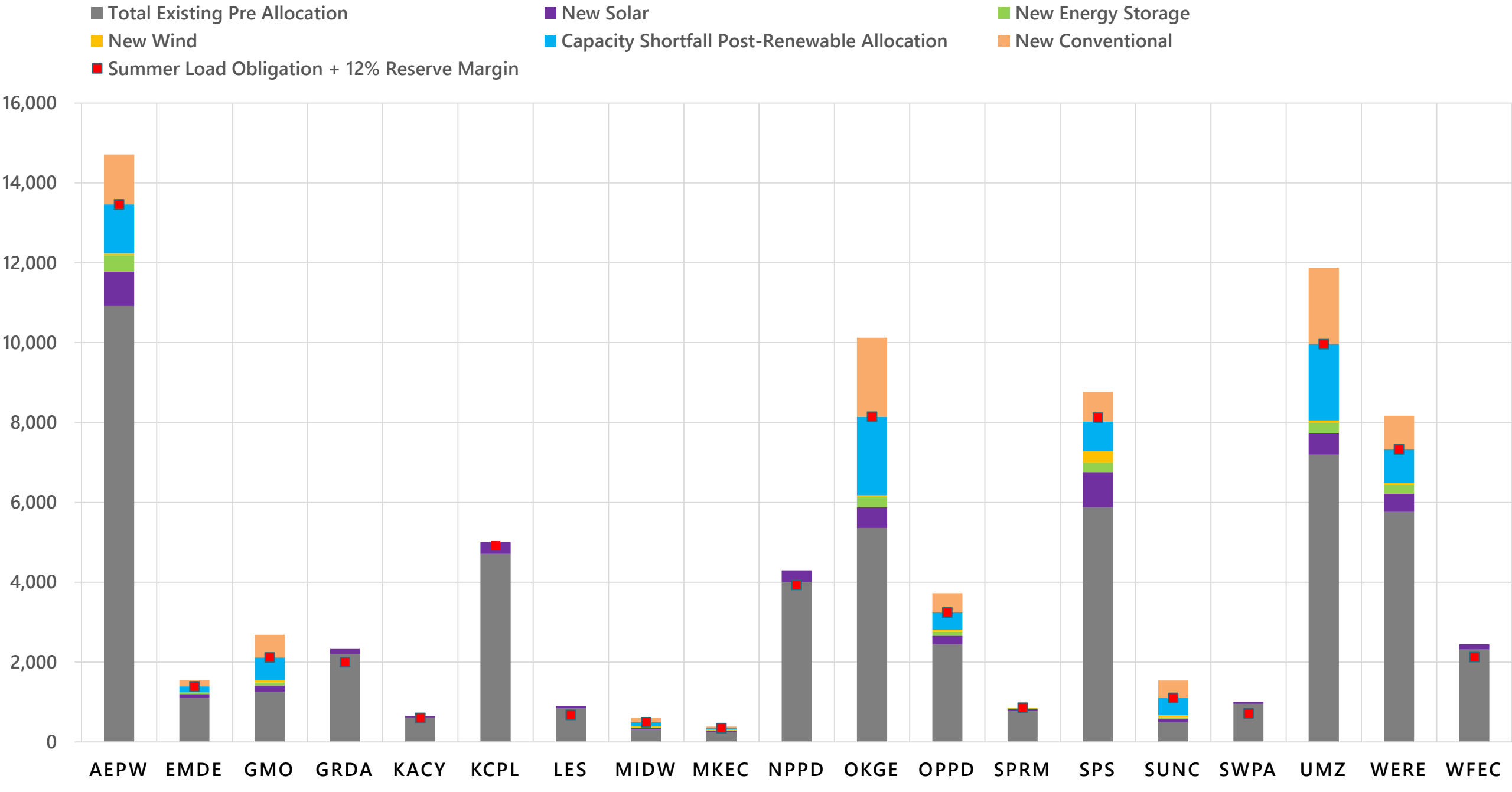
- Due to exception requests and 10.3 changes to RP1, RP2 approval will be done on the add'l May meeting.

APPENDIX

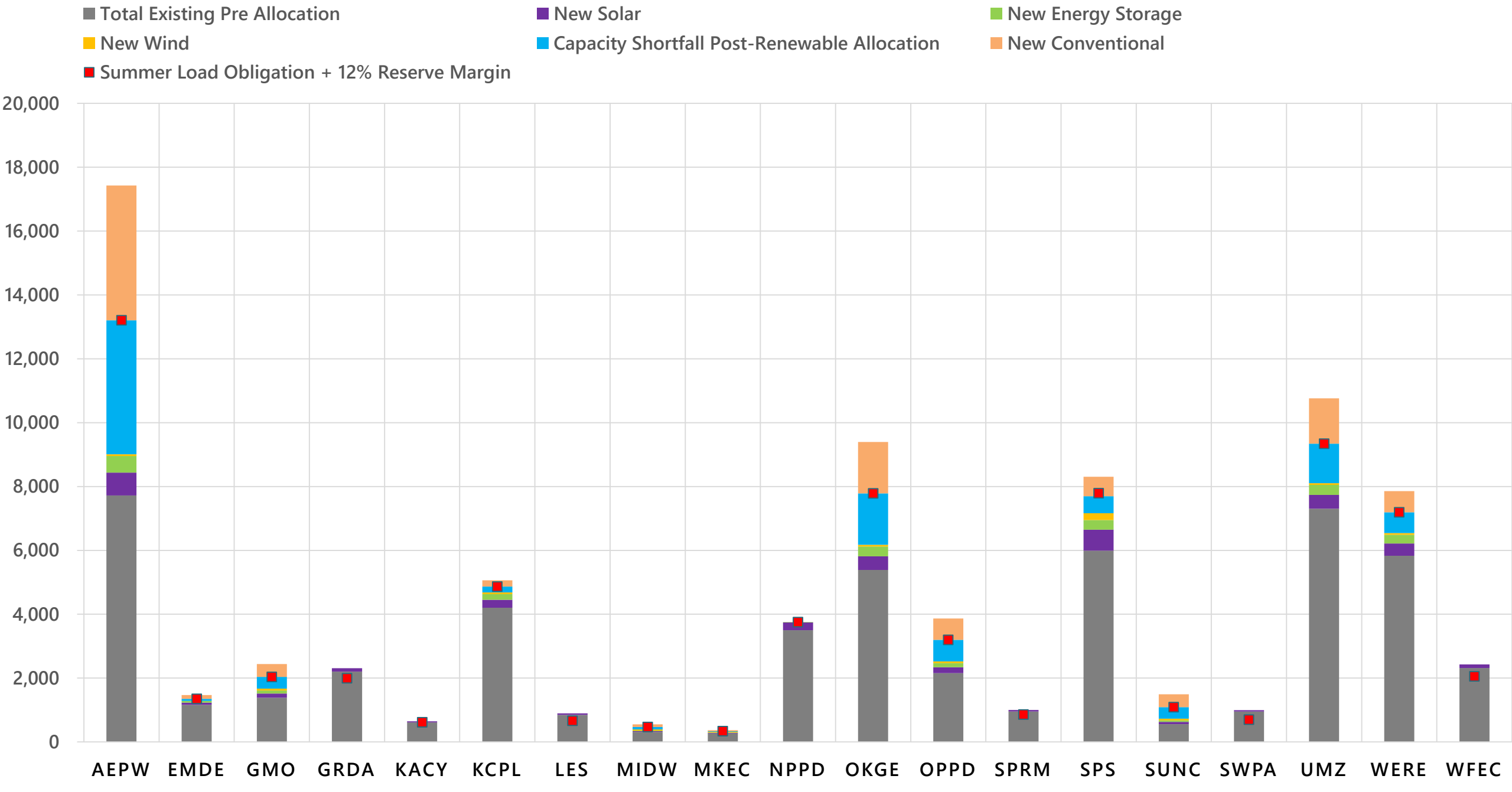
FUTURE 1 2026 ACCREDITED CAPACITY (MW)



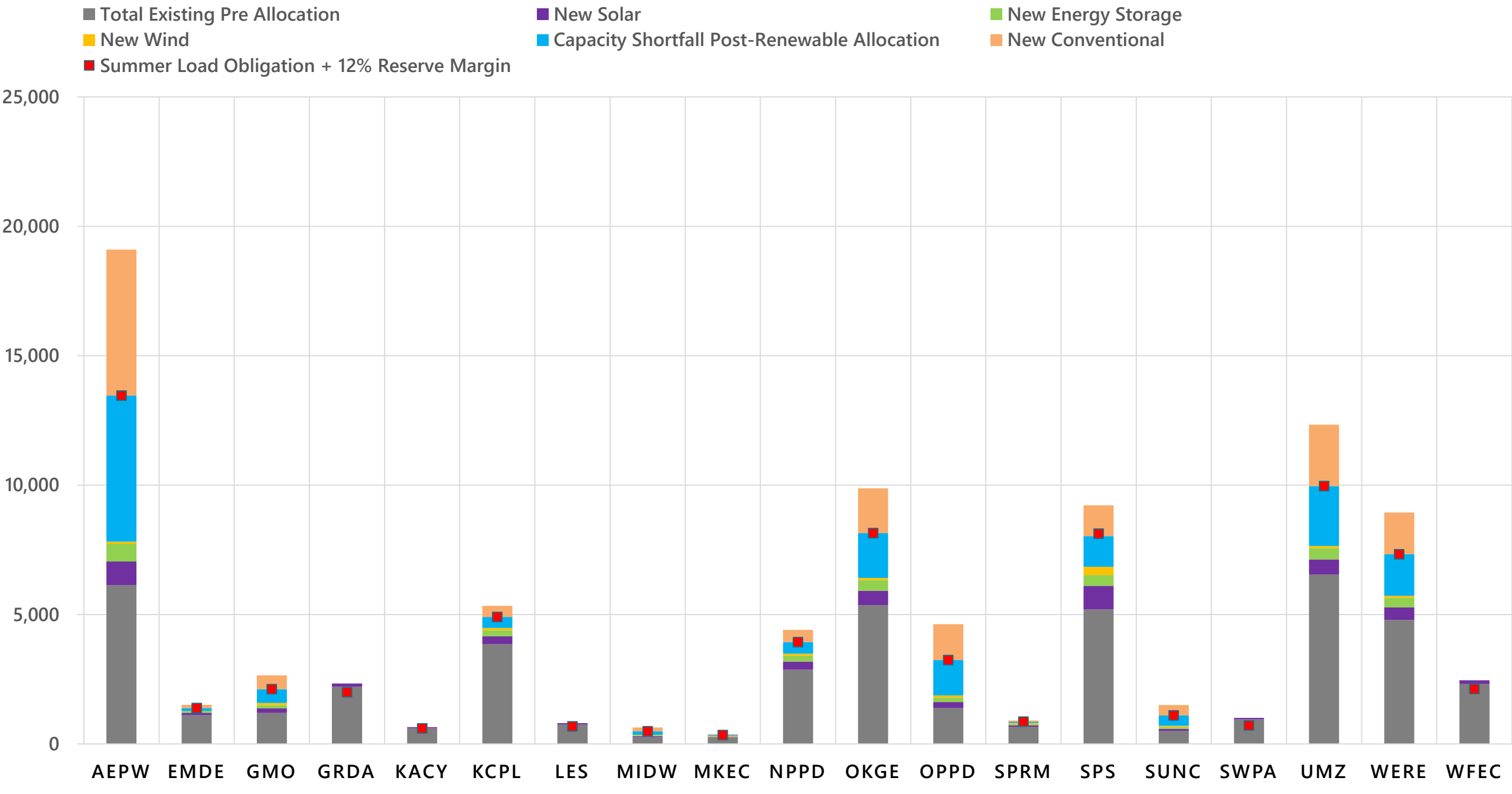
FUTURE 1 2031 ACCREDITED CAPACITY (MW)



FUTURE 2 2026 ACCREDITED CAPACITY (MW)



FUTURE 2 2031 ACCREDITED CAPACITY (MW)



Future 1						
	Y5			Y10		
Zone	Minimum CT Additions	Actual CT Additions	Surplus Capacity (MW)	Minimum CT Additions	Incremental CT Additions	Surplus Capacity (MW)
AEPW	3.16	3.90	-176.1	1.25	1.39	-34.0
GRDA	0.00	0.00	0.0	0.00	0.00	0.0
OKGE	0.00	0.00	0.0	8.29	8.35	-13.1
OTHSOU	0.00	0.00	0.0	0.00	0.00	0.0
SPS	3.46	3.10	-11.1	0.45	0.05	0.0
SWPA	0.00	0.00	0.0	0.00	0.00	0.0
WFEC	0.00	0.00	0.0	0.00	0.00	0.0
KACY	0.00	0.00	0.0	0.00	0.00	0.0
SPRM	0.00	0.00	0.0	0.00	0.00	0.0
EMDE	0.39	0.64	-58.1	0.00	0.00	-0.2
GMO	1.63	1.91	-66.6	0.49	0.50	-1.9
KCPL	0.00	0.00	0.0	0.00	0.00	0.0
MIDW	0.40	0.45	-12.5	-0.05	0.00	-11.5
MKEC	0.11	0.16	-12.6	0.00	0.00	-0.7
OTHKSMO	0.00	0.00	0.0	0.00	0.00	0.0
SUNC	1.76	1.84	-18.9	-0.01	0.00	-2.3
WERE	0.00	0.00	0.0	3.56	3.56	-0.4
LES	0.00	0.00	0.0	0.00	0.00	0.0
NPPD	0.00	0.00	0.0	0.00	0.00	0.0
OPPD	2.03	2.05	-4.1	-0.25	0.00	-58.3
OTHNEB	0.00	0.00	0.0	0.00	0.00	0.0
UMZ	5.16	5.95	-188.1	2.11	2.15	-8.9
OTHUMZ	0.00	0.00	0.0	0.00	0.00	0.0

Future 2						
	Y5			Y10		
Zone	Minimum CT Additions	Actual CT Additions	Surplus Capacity (MW)	Minimum CT Additions	Incremental CT Additions	Surplus Capacity (MW)
AEPW	17.70	17.81	-25.1	5.99	6.00	-2.4
GRDA	0.00	0.00	0.0	0.00	0.00	0.0
OKGE	6.80	6.80	-0.4	0.50	0.51	-2.2
OTHSOU	0.00	0.00	0.0	0.00	0.00	0.0
SPS	2.65	2.59	-82.2	2.80	2.45	-13.6
SWPA	0.00	0.00	0.0	0.00	0.00	0.0
WFEC	0.00	0.00	0.0	0.00	0.00	0.0
KACY	0.00	0.00	0.0	0.00	0.00	0.0
SPRM	0.00	0.00	0.0	0.19	0.20	-0.8
EMDE	0.28	0.49	-50.4	0.00	0.01	-2.1
GMO	1.54	1.71	-39.5	0.54	0.56	-2.9
KCPL	0.77	0.81	-8.4	1.00	1.00	-0.6
MIDW	0.32	0.36	-8.5	0.23	0.24	-3.3
MKEC	0.08	0.11	-7.2	0.04	0.04	0.0
OTHKSMO	0.00	0.00	0.0	0.00	0.00	0.0
SUNC	1.53	1.68	-36.4	0.00	0.00	-0.3
WERE	2.74	2.80	-13.1	3.98	4.00	-3.9
LES	0.00	0.00	0.0	0.00	0.00	0.0
NPPD	0.00	0.00	0.0	1.86	2.00	-33.3
OPPD	2.84	2.84	-0.1	2.93	3.00	-17.6
OTHNEB	0.00	0.00	0.0	0.00	0.00	0.0
UMZ	5.22	6.00	-185.3	3.77	4.00	-55.4
OTHUMZ	0.00	0.00	0.0	0.00	0.00	0.0

SPP Southwest Power Pool

2021 **ITP**

BATTERY SITING AND MODELING

BATTERY SITING PLAN

- 67% Solar and 33% Wind Association
- Site Priority (Solar & Wind):
  - Selected solar & wind sites with Battery GI Queue request
    - Capped at 2/3 of the total MW sited based on GI Queue
  - Rest of selected solar and wind sites by rank
    - Remaining MW sited
- All battery sites limited by request and renewable site capacity

SPP Southwest Power Pool

2021 ITP

MARKET ECONOMIC MODEL BUILD UPDATE

CHARLTON HILL

SOUTHWEST POWER POOL

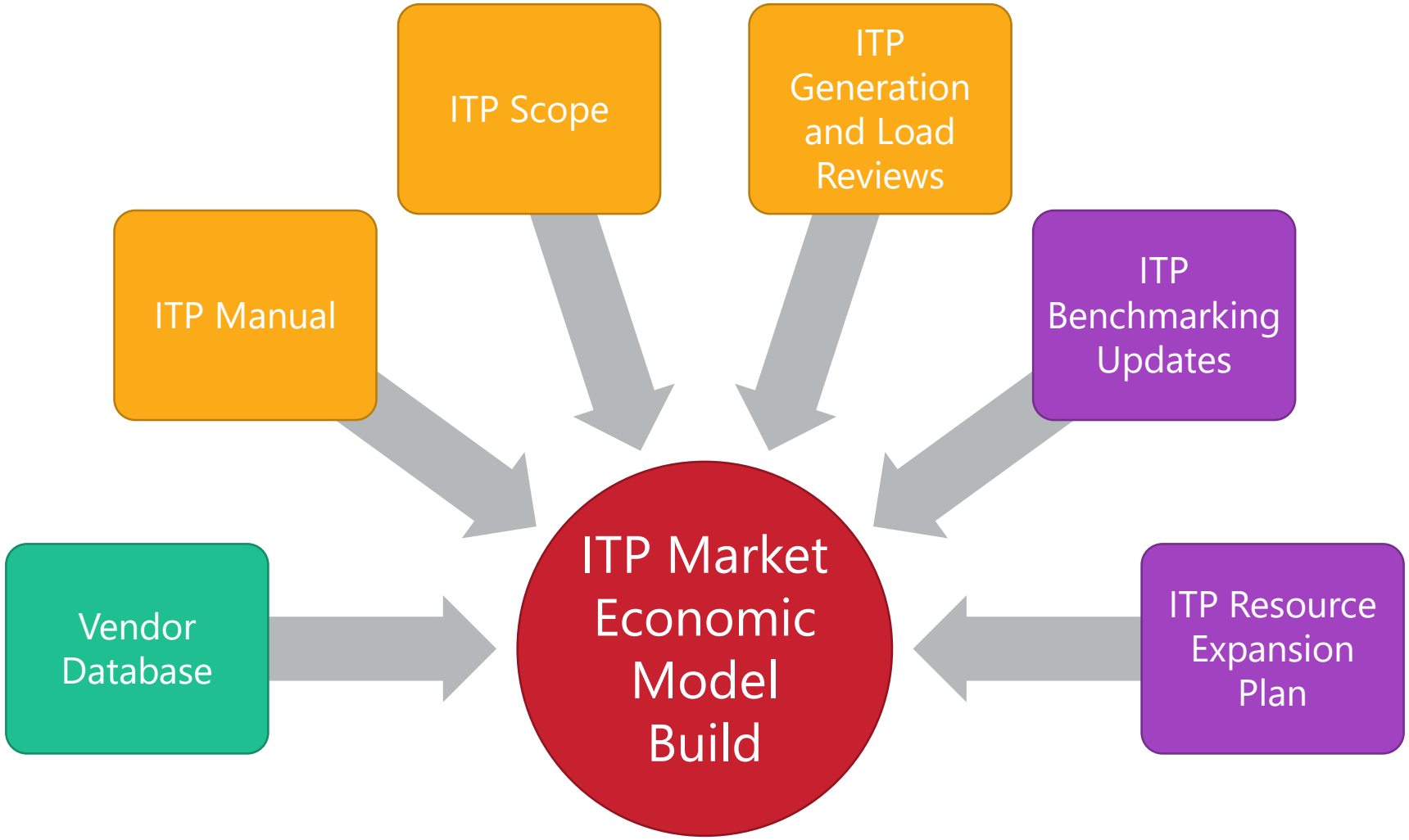
Helping our members work together to keep the lights on... today and in the future.

SouthwestPowerPool SPPorg southwest-power-pool

OBJECTIVE

- Provide 2021 ITP Market Economic Model (MEM) build update

MARKET ECONOMIC MODEL BUILD



NEW ITEMS FOR 2021 ITP MEM

- Future 2 Retirements
  - Coal generators over the age of 52 (56 for 2020)
  - Gas-fired and oil generators over the age of 48 (50 for 2020)
- SaskPower
- Must-run Unit Designations
- Hurdle Rates and Interchange
  - SPP and ESWG will review the data set
  - Document approved adjustments in the ITP assessment report

NEW ITEMS FOR 2021 ITP MEM CONTINUED

- 2% Inflation Rate
- Resource Plan
  - Increases to Renewable Resource Expansion Plan
- Bakken Area Load
- Inclusion from ITP Manual Revision Requests
  - Wood Mackenzie Gas Forecast
  - PST Modeling
  - Renewable Curtailment Pricing

ADDITIONAL UPDATES

- Investigating PROMOD engine to use for 2021 ITP
  - PROMOD 11.1.14 (current) vs. PROMOD 11.2.2 (potential)
- Implement process improvements
- Next Steps
  - Benchmarking
  - Constraint Assessment

ITP CHANGES FOR PERSISTENT OPERATIONAL ISSUES

WILL TOOTLE

5/6/2020

ITP MILESONTES

Milestone	Status	Previous Start Date	Previous End Date	Current Start Date	Current End Date
In mitigation; project end date is currently at low risk					
Detailed Project Proposal (DPP) Window		3/3/2020	4/2/2020	3/25/2020	4/23/2020
Staff Solutions Development		3/3/2020	6/8/2020	3/25/2020	5/26/2020
Solutions Technical Validation		3/3/2020	6/8/2020	3/25/2020	6/1/2020
Solutions Evaluation		4/13/2020	6/8/2020	4/13/2020	6/1/2020

ANNUAL TIME & COST BREAKDOWN PER OPTION

Option	Incremental Staff Cost ($)	Runtime (Hours)	Hardware Costs ($)	License Costs ($)	Total Annual Cost ($)
MCE - 365 days	$290k to $445k	36,500	$170k	$600k	$1M to $1.2M
MCE - 40 days	$180k to $260k	4,000	$20k	$72k	$270k to $350k
MCE - 4 days	$112k to $160k	400	$4k	$12k	$128k to $176k
Continue Benchmarking Ops and Planning Models	$0	0	$0	$0	$0

*Staff hours based off of $200/hour estimate
**Discussed in January ESWG

CURRENT STATUS

- ITP requires that solutions be determined within 3 months of a need identified
- Using operational tools to evaluate DPP options exceeds timing requirements of the ITP Manual
- Strong correlation between Planning process and Operational issues
  - 13 of 19 Ops issues have a NTC issued or recently in service
  - 2 of 19 Ops issues show up in current ITP study

RECOMMENDATION

- Review changes in RR

STRAW POLL

- 4 Staff (1 with modification)
- 11 Stakeholder (1 with modification)

Revision Request Form

SPP STAFF TO COMPLETE THIS SECTION	
RR #: 403	**Date: 3/13/2020**
RR Title: Change to ITP Operational Model Development	

System Changes ☒ No ☐ Yes

Process Changes? ☐ No ☒ Yes

Impact Analysis Required? ☒ No ☐ Yes | **If no, but system or process changes are expected please explain why an Impact Analysis will not be performed** (e.g. FERC Order, work included in another Impact Analysis for a related RR):

The language will be updated to support current capabilities that are already in place. There will be not be any additional software or staff time required to support the update.

SUBMITTER INFORMATION

Name: Will Tootle	**Company:** SPP
Email: wtootle@spp.org	**Phone:** 501-614-3515

Only Qualified Entities may submit Revision Requests.
Please select at least one applicable option below, as it applies to the named submitter(s).

☒ **SPP Staff** ☐ **SPP Market Participant** ☐ **SPP Member** ☐ **An entity designated by a Qualified Entity to submit a Revision Request "on their behalf"**	☐ **SPP Market Monitor** ☐ **Staff of government authority with jurisdiction over SPP/SPP member** ☐ **Rostered individual of SPP Committee, Task Force or Working Group** ☐ **Transmission Customers or other entities that are parties to transactions under the Tariff**

REVISION REQUEST DETAILS

Requested Resolution Timing: ☒ **Normal** ☐ **Expedited** ☐ **Urgent Action**

Reason for Expedited/Urgent Resolution:

Type of Revision (select all that apply):

☒ Correction *(i.e., revising erroneous language or language that needs clean-up for grammatical errors or inconsistency across governing documents - no changes to intent or policy)*

☐ Clarification *(i.e., revising language to better represent existing intent, no changes to functionality or policy)*

☐ Enhancement *(i.e., revising language to expand upon existing intent or functionality)*

☐ New Protocol, Business Practice, Criteria, Tariff *(i.e, new language to accommodate new functionality or policy not existing today)*

☐ NERC Standard Impact *(Specifically state if revision relates to/or impacts NERC Standards, list standard(s))*

☐ FERC Mandate *(List order number(s))*

REVISION REQUEST RISK DRIVERS

Are there existing risks to one or more SPP Members or the BES driving the need for this RR? ☐ Yes ☒ No

If yes, provided details to explain the risk and timelines associated:

☐ Compliance (Tariff, NERC, Other)

☐ Reliability/Operations

☐ Financial

SPP Documents Requiring Revision: *Please select your primary intended document(s) as well as all others known that could be impacted by the requested revision (e.g. a change to a protocol that would necessitate a criteria or business practice revision).*		
☐ **Market Protocols**	**Section(s):**	**Protocol Version:**
☐ **Operating Criteria**	**Section(s):**	**Criteria Date:**
☐ **Planning Criteria**	**Section(s):**	**Criteria Date:**
☐ **Tariff (OATT)**	**Section(s):**	
☐ **Business Practice**	**Business Practice Number:**	
☒ **Integrated Transmission Planning (ITP) Manual**	**Section(s): 2.4; .4.4; 5.3.4**	
☐ **Revision Request Process**	**Section(s):**	
☐ **Minimum Transmission Design Standards for Competitive Upgrades (MTDS)**	**Section(s):**	
☐ **Reliability Coordinator and Balancing Authority Data Specifications (RDS)**	**Section(s):**	
☐ **SPP Communications Protocols**	**Section(s):**	

OBJECTIVE OF REVISION

Objectives of Revision Request:

The current method for evaluating solutions for constraints classified as economic operational needs requires the use of day-ahead reliability unit commitment models to perform analysis. After thorough review it was determined that this method is not feasible. Software revisions made throughout the year prevent model building on historic time periods. The model building software is not backwards compatible to support comparative analysis of projects.

The language will be updated to support current capabilities that are already in place. There will not be any additional software or staff time required to support the update since the types of models that are being evaluated are being reduced. Current processes that identify benchmarks between Operations and Planning models will be documented. Needs due to economic persistent operational issues will continue to be posted as information.

REVISIONS TO SPP DOCUMENTS

In the appropriate sections below, please provide the language from the current document(s) for which you are requesting revision(s), with all edits redlined.

Integrated Transmission Planning (ITP) Manual

2.4 OPERATIONAL MODEL DEVELOPMENT

After persistent operational needs are identified, SPP will identify the most extreme case(s) from the SPP energy management system to evaluate whether the needs are addressed with proposed solutions. These cases where the persistent operational needs are present will be used to develop ~~A~~a set of operational powerflow models that will be utilized to evaluate solutions. ~~SPP will use an energy management system snapshot model for reliability operational needs and the day ahead reliability unit commitment (DA-RUC) model for economic operational needs. Times with high loading or that require voltage mitigation for each operational need will be selected and the models converted to an ITP model format.~~

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4.4 PERSISTENT OPERATIONAL NEEDS ASSESSMENT

Persistent operational needs may be either economic or reliability related. The criteria for identifying these needs is described in this section. SPP may propose additional needs to account for other problematic operational issues observed in operating the transmission system not fitting the given criteria. These additional needs will be presented to the ESWG and TWG for review and endorsement.

4.4.1 ECONOMIC OPERATIONAL NEEDS

SPP will classify flowgates meeting either of the following criteria as economic needs:

1. The flowgate was congested for at least 20 percent of the previous 24 months, either in a breached or binding state in the real-time balancing market solution, or

2. The flowgate had congestion costs totaling more than $10 million over the previous 24 months.

Periods of time when a flowgate's related congestion is deemed to be the result of prior outage conditions will be excluded from these criteria calculations. Congestion cost for outages will be provided for informational purposes.

Persistent economic operational issues due to flowgate congestion will be investigated during the ITP scope development. SPP staff and the ESWG will review flowgates that had congestion costs totaling more than $50 million over the previous 24 months, determine the appropriate analysis to be performed, and document in the study's scope.

Other needs due to congested flowgates will be reported for informational purposes and will not be subject to the solution evaluation process detailed in the Persistent Operational Solution Evaluations section. These informational needs could prove helpful when evaluating solutions to other needs identified in the economic needs assessment.

SPP also will identify economic needs considering manual commitments of uneconomic generation for local area voltage support, according to either of the following criteria:

1. Manual commitment events that include startup and extension 25 percent of the year, or
2. Manual commitments that do not exceed 25 percent of the year, but cost over $1 million dollars over 24 months.

4.4.2 RELIABILITY OPERATIONAL NEEDS

SPP will classify facilities as reliability needs due to system reconfiguration using agreed upon (by SPP and the transmission operator) operational guides or load shed as a result of unsuccessful control of the system through re-dispatch if they meet the following criteria:

1. High- or low-voltage issues where system reconfiguration is implemented 10 percent of the year due to non-outage issues , or
2. Thermal loading issues where system reconfiguration through the use of an agreed upon operating guide has been implemented in real-time 25 percent of the year.

…

5.3.4 PERSISTENT OPERATIONAL SOLUTION EVALUATIONS

A subset of solutions will be evaluated to address persistent operational needs utilizing the filtering criteria, as approved by the TWG, ESWG and ORWG. Reliability solutions will be evaluated by the CLR and CVR metrics described in the Reliability Solution Evaluation section. Economic solutions will be evaluated based on criteria developed by SPP and stakeholders, which will be detailed in the study scope.

The ~~needs~~ solutions will be evaluated using operational models that capture actual historical occurrences. The ORWG, TWG, and ESWG will approve these operational models to ensure consistency with the criteria established in the Persistent Operational Needs Assessment section.

Revision Request Comment Form

RR #: 403	Date: 4/30/2020
RR Title: Change to ITP Operational Model Development	
SUBMITTER INFORMATION	
Name: Derek Brown, Nate Morris, Randy Lindstrom, Josh Verzal	**Company: Evergy, Liberty, NPPD, OPPD**
Email: derek.brown@evergy.com; nate.morris@libertyutilities.com; rrlinds@nppd.com; jverzal@oppd.com	**Phone:**

OBJECTIVE OF REVISION

The current method for evaluating solutions for constraints classified as economic operational needs requires the use of day-ahead reliability unit commitment models to perform analysis. After thorough review it was determined that this method is not feasible. Software revisions made throughout the year prevent model building on historic time periods. The model building software is not backwards compatible to support comparative analysis of projects.

The language will be updated to support current capabilities that are already in place. There will be not be any additional software or staff time required to support the update since the types of models that are being evaluated are being reduced. Current processes that identify benchmarks between Operations and Planning models will be documented. Needs due to economic persistent operational issues will continue to be posted as information.

COMMENTS

Evergy agrees there is a need to revise the ITP Manual language describing the evaluation of the subset of persistent operational needs classified as economic operational needs.

SPP Staff states in the Objective of Revision section that no additional software or staff time will be required to support the update since the types of models that are being evaluated are being reduced. Evergy believes this statement is in reference to the redline deletion in section 2.4 of the ITP Manual requiring SPP to build reliability unit commitment (DA RUC) models for economic operational needs. SPP Staff also states in this section that current processes that identify benchmarks between Operations and Planning models will be documented. Evergy agrees this needs to be done but believes the benchmarking scope described in section 3 of the ITP Manual needs to be expanded because today it only focuses on comparisons of Year 2 of the models. These scopes should be expanded or an additional section should be added to document that this model comparison process may be done during the needs assessment on an ad hoc basis to identify discrepancies between the planning and operational models. The new language added by SPP staff in section 4.4.1 should reference section 3 for clarification.

RR403, as drafted, proposes edits to the ITP Manual to identify economic operational needs as informational only and doing model comparisons on any needs that are not showing up in the economic models. Evergy agrees that identification of the economic operational needs should continue to be done but believes additional actions should be available to address these needs—i.e., these needs should not be solely for informational purposes. The process for evaluating these needs should continue to be annually detailed in the ITP scope that is approved by TWG and ESWG. Evergy believes this will provide more flexibility to identify and change in approaches year over year to find what works best to solve any gaps between the planning and operational models.

Evergy recommends that SPP Staff be required to bring every persistent operational need not solved in the ITP to TWG and ESWG with a recommendation and timeline for implementation. The recommendation could be to do a project, no project, do further analysis such as build reliability unit commitment models (DA RUC), and/or do a Target Area Analysis. If recommended, reliability unit commitment models should be part of a Target Area analysis that is scoped out in the annual ITP and approved by applicable SPP working groups. Should these specific Target Area needs not be resolved, then they should continue to be evaluated in subsequent ITP studies to look for possible long-term solutions.

PROPOSED REVISION

Provide proposed modifications (redlined) to the revision request for which you are providing comments. Use language from the revision request and redline with your additional edits.

2.4 OPERATIONAL MODEL DEVELOPMENT

After persistent operational needs are identified, SPP will identify the most extreme case(s) to evaluate whether the needs are addressed with proposed solutions. A set of operational powerflow models where the persistent operational needs are present will be utilized to evaluate solutions. ~~SPP will use an energy management system snapshot model for reliability operational needs and the day ahead reliability unit commitment (DA RUC) model for economic operational needs. Times with high loading or that require voltage mitigation for each operational need will be selected and the models converted to an ITP model format.~~

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~~The needs due to congested flowgates will be reported for informational purposes and will not be subject to the solution evaluation process detailed in the Persistent Operational Solution Evaluations section.~~ These ~~informational~~ needs could prove helpful when evaluating solutions to other needs identified in the economic needs assessment. SPP will track persistent operational needs against needs identified in the current ITP, identify any inconsistencies between operational and planning models, ~~and~~ determine the need for any model adjustments, and make an approval recommendation to applicable stakeholder working groups on how to address any unresolved economic operational needs with a timeline for implementation.

SPP also will identify economic needs considering manual commitments of uneconomic generation for local area voltage support, according to either of the following criteria:

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The ~~needs~~ solutions will be evaluated using operational models that capture actual historical occurrences. The ORWG, TWG, and ESWG will approve these operational models to ensure consistency with the criteria established in the Persistent Operational Needs Assessment section.