SOUTHWEST POWER POOL
ECONOMIC STUDIES WORKING GROUP MEETING

May 5-6, 2021
Net Conference

SUMMARY OF MOTIONS AND ACTION ITEMS

General:

- Approved the **2022 ITP Renewable Policy Review**
- Approved the energy efficiency value as presented **(3.8% reduction in commercial and industrial load) for the 20-Year Assessment**
- Approved the **Load and Generation Review workbooks** for use in the **20-Year Assessment**
- Approved the **2022 ITP Resource Plan Phase I** through email vote

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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
Derek Brown, Evergy
Gayle Nansel, WAPA
Jeremy Severson, BEPC
Jody Holland, SCMCN
Kurt Stradley, LES
Kyle McKinney, GSEC
Michael Watt, OMPA
Randy Collier, CUS
Steve Gaw, APA
Steve Hohman, OPPD
Tim Owens, NPPD
Zac Hager, OGE

Proxies:
Phil Westby for Jeremy Severson

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

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

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

AGENDA ITEM 2 – CONSENT AGENDA

The consent agenda included the following items:

Renewable Policy Review (Attachment 4 – 2022 Renewable Policy Review)

The consent agenda was approved.

AGENDA ITEM 3 – REVIEW OF PAST ACTION ITEMS

Joshua Norton reviewed past action items. Alan Myers noted that items 203 and 209 could be marked as complete. (Attachment 5 – Past Action Items)

AGENDA ITEM 4A – 2021 ITP: SCHEDULE

Dara Solomon reviewed the 2021 Integrated Transmission Plan (ITP) schedule and lessons learned for Resource Plan Phase 1, Resource Plan Phase 2 (RP2), and Siting and GOFs. Anita noted that more than 1 week of review is needed for RP2 and submitting exceptions. Steve Gaw asked about the costs of GOFs and Brooke Keene responded that the costs would be included in the 2022 Generator Outlet Facilities (GOF) presentation. (Attachment 6 – 2021 ITP Schedule)

AGENDA ITEM 4B – 2021 ITP: MEM UPDATE

Charlton Hill updated the group on the Market Economic Model (MEM) build process and next steps. (Attachment 7 – 2021 ITP MEM)

AGENDA ITEM 4C – 2021 ITP: TARGET AREA FINALIZATION

Chris Jamieson reviewed the target area scope, background, and sensitivity models and needs. He discussed the SPS-New Mexico Ties interface and the need for a comprehensive solution. Jody Holland raised concern over time being spent on target areas. (Attachment 8 – 2021 ITP Target Areas Update)

AGENDA ITEM 4D – 2021 ITP: ECONOMIC AND POLICY NEEDS ASSESSMENT

Maurisa Hughes gave an update on the 2021 ITP Economic Needs Assessment. She reviewed economic needs criteria and flowgate considerations. (Attachment 9 – 2021 Economic Needs Assessment Update)

AGENDA ITEM 4E – 2021 ITP: 2021 SUMMIT DATE

Kirk Hall presented a SCRIPT Decision Quality sub-team recommendation for handling the Planning Summit and moving it to a later date. (Attachment 10 – 2021 ITP Summit Update)

AGENDA ITEM 4F – 2021 ITP: 2021/2022 ITP PLANNING VS. OPERATION CONGESTION

Chris Jamieson reviewed the key performance indicator for planning and operations needs comparison, provided a quarterly 2021 ITP MEM and Operations congestion comparison, and presented next steps for solution evaluation efforts. (Attachment 11 – 2021 & 2022 ITP Persistent Economic Operational Solution Evaluation)

AGENDA ITEM 4G – 2021 ITP: ITP MITIGATION STATUS UPDATE

Chris Davis gave an update on the ITP mitigation status.

AGENDA ITEM 5A – 20-YEAR ASSESSMENT: LOAD & GENERATION REVIEW

Brooke Keene reviewed data for energy efficiency trends and forecasts that contributed to a recommendation to reduce energy for commercial and industrial loads only by 3.8% for the 20-year assessment. She reviewed notes on the load and gen review activity and recommended the ESWG approve the Load and Generation Review workbooks for use in the 20-Year Assessment. (Attachment 12 – 20YA Load and Gen Review)

> **Calvin Daniels made a motion, seconded by Jody Holland to approve the energy efficiency value as presented (3.8% reduction in commercial and industrial load) and to approve the Load and Generation Review workbooks for use in the 20-Year Assessment. The motion was approved unanimously.**

AGENDA ITEM 5B – 20-YEAR ASSESSMENT: SCOPE EXECUTION ITEMS

Sherri Maxey reviewed the list for 20-Year Assessment scope items. (Attachment 13 – 20YA Scope and Study Execution Items)

AGENDA ITEM 6A – 2022ITP: SCHEDULE INCLUDING 20-YEAR ASSESSMENT

Dara Solomon reviewed the 2022 ITP and 20-Year Assessment schedules. (Attachment 14 – 2022 ITP and 20YA Schedules)

AGENDA ITEM 6B – 2022 ITP: SITING PLAN

Joshua Norton reviewed a high-level Siting Plan schedule, reviewed the distributed solar process, exceptions process, and provided links to the resource siting whitepaper and manual. (Attachment 15 – Siting Plan)

AGENDA ITEM 7 – CLOSING ITEMS

There were no action items taken.

EMAIL ITEMS

2022 ITP RESOURCE PLAN PHASE I

A motion was solicited to approve the 2022 ITP Resource Plan Phase I on April 14, 2021.

> **Jeremy Severson made a motion, seconded by Tim Owens to approve the 2022 ITP Resource Plan Phase I, as posted per the transmittal letter. The motion was approved unanimously.**

Respectfully Submitted,

Joshua Norton

Secretary

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Proxy Statements

Member	Proxy	Note
Jeremy Severson	Phil Westby	

I will be unable to attend the May ESWG meeting and so will be passing my proxy to Phil Westby for the May 5-6 meeting.

Best regards,

Jeremy..

SOUTHWEST POWER POOL, INC.
ECONOMIC STUDIES WORKING GROUP MEETING
May 5-May 6, 2021
Net Conference

AGENDA

Wednesday, 8:00a.m – 12:00p.m.
Thursday, 8:00a.m – 12:00p.m.

1. Administrative Items..Alan Myers (15 min)
   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. Renewable Policy Review
3. Review of Past Action Items[1]..Joshua Norton (10 min)
4. 2021 ITP
   A. Schedule[1]..Dara Solomon (15 min)
   B. MEM Update[1] ....Charlton Hill (10 min)
   C. Target Area Finalization[1] ....Chris Jamieson (30 min)
   D. Economic and Policy Needs Assessment[1] ....Maurisa Hughes (30 min)
   E. 2021 Summit Date[1] ....Kirk Hall (20 min)
   F. 2021/2022 ITP Planning vs. Operation Congestion[1]..............................Chris Jamieson (20 min)
   G. ITP Mitigation Status Update ....Chris Davis (10 min)

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[1] Background Material Included

5. 20-Year Assessment

   A. Load & Generation Review (Approval)[1] .... Brooke Keene (30 min)

   B. Scope Execution Items[1] .... Sherri Maxey (15 min)

6. 2022 ITP

   A. Schedule including 20-Year Assessment[1] .... Dara Solomon (15 min)

   B. Siting Plan[1] .... Joshua Norton (20 min)

7. Closing Items .... All (10 min)

   A. Summary of Action Items

   B. Upcoming Meeting Agenda Items

   C. Future Meetings

      i) May 19, 2021: Net Conference 1-3PM
      ii) June 2-3, 2021: Net Conference
      iii) June 30-July 1, 2021: Net Conference
      iv) August 4-5, 2021: Net Conference

2022 ITP RENEWABLE POLICY REVIEW

KRISHADA WATSON

MAY 5-6, 2021

NOTES

- RPR was posted on GlobalScape on March 24, 2021
- ESWG approved RP1 on April 16, 2021 which is fed by the renewable resource plan

RENEWABLE POLICY REVIEW RESULTS – PART 1

Renewable Mandates and Goals					Future 1		Future 2		
Utility	State	Mandate/ Goa	Renewable Typ	Energy/Capacity	2027 Requiremen	2032 Requiremen	2027 Requiremen	2032 Requiremen	Comments
Arkansas Electric Coop Corp.	Arkansas	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Arkansas Electric Coop Corp.	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Arkansas Electric Coop Corp.	Texas	Mandate	Both	Capacity (MW)	0.3	0.3	0.3	0.3	
Basin Electric Power Cooperative	Colorado	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Basin Electric Power Cooperative	Iowa	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Basin Electric Power Cooperative	Minnesota	Mandate	Both	Energy (MWh)	142,404.7	153,367.0	142,821.5	155,140.9	
Basin Electric Power Cooperative	Montana	Mandate	Both	Energy (MWh)	321,731.5	329,418.0	322,673.0	333,228.2	
Basin Electric Power Cooperative	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Basin Electric Power Cooperative	North Dakota	Goal	Both	Energy (MWh)	1,740,202.5	1,908,730.4	1,745,294.9	1,930,807.9	
Basin Electric Power Cooperative	North Dakota	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Basin Electric Power Cooperative	South Dakota	Goal	Both	Energy (MWh)	803,430.8	865,621.3	805,781.9	875,633.6	
Basin Electric Power Cooperative	Wyoming	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
City of Grand Island	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
City Utilities of Springfield (Springfield, MO)	Missouri	Mandate	Both	Energy (MWh)	495,898.8	501,349.5	498,232.6	510,675.4	
Corn Belt Power Cooperative	Iowa	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Corn Belt Power Cooperative	South Dakota	Goal	Both	Energy (MWh)	1,046.1	1,063.1	1,049.1	1,075.4	
East Texas Electric Cooperative	Louisiana	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
East Texas Electric Cooperative	Texas	Mandate	Both	Capacity (MW)	53.7	54.5	53.7	54.5	
Empire District Electric Co.	Arkansas	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Empire District Electric Co.	Kansas	Goal	Both	Capacity (MW)	14.5	15.6	14.5	15.6	
Empire District Electric Co.	Missouri	Mandate	Both	Energy (MWh)	792,377.3	841,158.4	795,729.3	855,223.2	
Empire District Electric Co.	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Golden Spread Electric Coop	New Mexico	Mandate	Both	Energy (MWh)	34,985.9	44,433.7	35,198.6	45,511.1	
Golden Spread Electric Coop	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Golden Spread Electric Coop	Texas	Mandate	Both	Capacity (MW)	65.4	66.7	65.4	66.7	
Grand River Dam Authority	Kansas	Goal	Both	Capacity (MW)	23.8	23.3	23.8	23.3	
Grand River Dam Authority	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Greater Missouri Operations Company	Kansas	Goal	Both	Capacity (MW)	-	-	-	-	One bus that contains no load
Greater Missouri Operations Company	Missouri	Mandate	Both	Energy (MWh)	1,452,865.5	1,483,496.4	1,459,395.0	1,509,849.1	
Hastings Utilities (NE)	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Heartland Consumers Power District	Minnesota	Mandate	Both	Energy (MWh)	5,389.9	5,495.2	5,405.7	5,558.7	
Heartland Consumers Power District	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Heartland Consumers Power District	North Dakota	Goal	Both	Energy (MWh)	1,165.1	1,176.0	1,168.6	1,189.6	
Heartland Consumers Power District	South Dakota	Goal	Both	Energy (MWh)	68,979.2	70,334.1	69,181.1	71,147.6	
Independence Power & Light Dept.	Missouri	Mandate	Both	Energy (MWh)	183,723.6	188,644.1	184,719.9	192,687.5	Exempt
Kansas City Board of Public Utilities	Kansas	Goal	Both	Capacity (MW)	109.2	111.4	109.2	111.4	Exempt
Kansas City Power & Light Co.	Kansas	Goal	Both	Capacity (MW)	293.2	292.1	293.2	292.1	
Kansas City Power & Light Co.	Missouri	Mandate	Both	Energy (MWh)	1,345,857.9	1,379,592.6	1,351,968.1	1,404,348.7	
Kansas Electric Power Coop. Inc.	Kansas	Goal	Both	Capacity (MW)	70.0	71.0	70.0	71.0	Exempt
Kansas Municipal Energy Agency	Kansas	Goal	Both	Capacity (MW)	47.5	50.3	47.5	50.3	
Kansas Power Pool	Kansas	Goal	Both	Capacity (MW)	40.4	41.4	40.4	41.4	Exempt
Lincoln Electric System	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Lubbock Power and Light	Texas	Mandate	Both	Capacity (MW)	10.6	11.1	10.6	11.1	
Midwest Energy Inc.	Kansas	Goal	Both	Capacity (MW)	80.1	84.9	80.1	84.9	
Missouri River Energy Services in SPP	Iowa	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Missouri River Energy Services in SPP	Minnesota	Mandate	Both	Energy (MWh)	87,374.1	94,922.8	87,629.7	96,020.8	Exempt
Missouri River Energy Services in SPP	North Dakota	Goal	Both	Energy (MWh)	7,014.5	7,534.9	7,035.0	7,622.1	Exempt
Missouri River Energy Services in SPP	South Dakota	Goal	Both	Energy (MWh)	93,553.4	100,277.9	93,827.1	101,437.8	Exempt

*mandates and goals are based on ITP Manual methodology to proxy actual RPS

RENEWABLE POLICY REVIEW RESULTS – PART 2

Renewable Mandates and Goals					Future 1		Future 2		
Utility	State	Mandate/ Goa	Renewable Typ	Energy/Capacity	2027 Requiremen	2032 Requiremen	2027 Requiremen	2032 Requiremen	Comments
MOPEP	Missouri	Mandate	Both	Energy (MWh)	84,308.2	88,599.5	84,689.6	90,183.7	
Municipal Energy Agency of Nebraska	Colorado	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Municipal Energy Agency of Nebraska	Iowa	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Municipal Energy Agency of Nebraska	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Munis in OPPD	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Munis in SPS	Kansas	Goal	Both	Capacity (MW)	1.0	1.0	1.0	1.0	
Munis in SPS	New Mexico	Mandate	Both	Energy (MWh)	52,730.0	66,450.7	52,932.2	67,457.7	
Munis in SPS	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Munis in SPS	Texas	Mandate	Both	Capacity (MW)	3.8	3.8	3.8	3.8	
Nebraska Public Power District	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Nebraska Public Power District	South Dakota	Goal	Both	Energy (MWh)	2,259.9	2,246.7	2,270.4	2,288.4	Exempt
NorthWestern Public Service	South Dakota	Goal	Both	Energy (MWh)	249,790.1	252,381.1	250,521.1	255,300.3	
Oklahoma Gas & Electric Company	Arkansas	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Oklahoma Gas & Electric Company	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Oklahoma Gas & Electric Company	Texas	Mandate	Both	Capacity (MW)	-	-	-	-	One bus that contains no load
Oklahoma Municipal Power Authority	Arkansas	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Oklahoma Municipal Power Authority	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Oklahoma Municipal Power Authority	Texas	Mandate	Both	Capacity (MW)	0.3	0.3	0.3	0.3	
Omaha Public Power District	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Peoples Electric	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Public Service Company of Oklahoma	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Southwestern Electric Power Company	Arkansas	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Southwestern Electric Power Company	Louisiana	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Southwestern Electric Power Company	Texas	Mandate	Both	Capacity (MW)	85.0	85.7	85.0	85.7	
Southwestern Power Administration	Arkansas	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Southwestern Power Administration	Missouri	Mandate	Both	Energy (MWh)	269,572.2	275,658.1	270,643.8	279,989.1	Exempt
Southwestern Public Service Company	New Mexico	Mandate	Both	Energy (MWh)	5,252,948.8	7,367,218.3	5,270,182.7	7,463,617.7	
Southwestern Public Service Company	Texas	Mandate	Both	Capacity (MW)	137.0	139.0	137.0	139.0	
Southwind Energy Group	Arkansas	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Southwind Energy Group	Kansas	Goal	Both	Capacity (MW)	21.5	22.0	21.5	22.0	
Sunflower Electric Power Corp.	Kansas	Goal	Both	Capacity (MW)	191.4	192.7	191.4	192.7	
Sunflower Electric Power Corp. Unaffliated	Kansas	Goal	Both	Capacity (MW)	76.9	72.3	76.9	72.3	
WAPA - Upper Great Plains East	Iowa	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
WAPA - Upper Great Plains East	Minnesota	Mandate	Both	Energy (MWh)	112,139.4	113,045.1	112,467.6	114,352.7	Exempt
WAPA - Upper Great Plains East	Montana	Mandate	Both	Energy (MWh)	17,216.5	18,375.5	17,266.8	18,588.0	Exempt
WAPA - Upper Great Plains East	Nebraska	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
WAPA - Upper Great Plains East	North Dakota	Goal	Both	Energy (MWh)	24,448.5	24,646.7	24,520.1	24,931.8	Exempt
WAPA - Upper Great Plains East	South Dakota	Goal	Both	Energy (MWh)	90,064.6	90,784.9	90,328.2	91,834.9	Exempt
Westar Energy	Kansas	Goal	Both	Capacity (MW)	1,052.1	1,071.4	1,052.1	1,071.4	
Western Farmers Electric Cooperative	Kansas	Goal	Both	Capacity (MW)	2.8	2.8	2.8	2.8	
Western Farmers Electric Cooperative	Oklahoma	--	--	--	--	--	--	--	No state RPS, see ITP Manual for more detail
Western Farmers Electric Cooperative	Texas	Mandate	Both	Capacity (MW)	0.8	0.8	0.8	0.8	
WFEC Coops in SPS	New Mexico	Mandate	Both	Energy (MWh)	1,043,778.5	1,466,843.9	1,047,780.4	1,489,072.8	
WFEC Coops in SPS	Texas	Mandate	Both	Capacity (MW)	6.5	7.8	6.5	7.8	

*mandates and goals are based on ITP Manual methodology to proxy actual RPS

RECOMMENDATION

- SPP Staff recommends the ESWG approve the results from Renewable Policy Review as presented on slides 3-4 for the 2022 ITP

Southwest Power Pool, Inc.

ECONOMIC STUDIES WORKING GROUP

Action Items Status Report

May 5-6, 2021

#	Action Item	Date Originated	Status	Comments
190	Utilize the results from RCAR III to determine the ratio of APC benefit to Transmission Outages benefit to be applied in the ITP assessments.	October 12th, 2017	On Hold	Working with SPP operations on additional APC benefit with outages included. Mar: Ops is planning to perform after RCAR III and Value of Transmission study.
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	In Progress	Goal: to complete and implement for the 2021 ITP Assessment Continue discussing the battery storage piece **May:** Battery Survey in progress
201	Review the interchange methodology	July 2019	In Progress	Goal: To complete for the 2021 ITP Assessment Mar: 2021 portion considered complete. Outstanding long-term items: • Transactions between simulated and non-simulated regions • Benchmarking of pseudo-ties
203	Conduct a Lessons Learned Session with the ESWG on the 2019 ITP Assessment	August 2019	In Progress	Presented in June 2020; more to cover soon in addition to 2020 ITP Feb: Adding to schedule slides soon to report

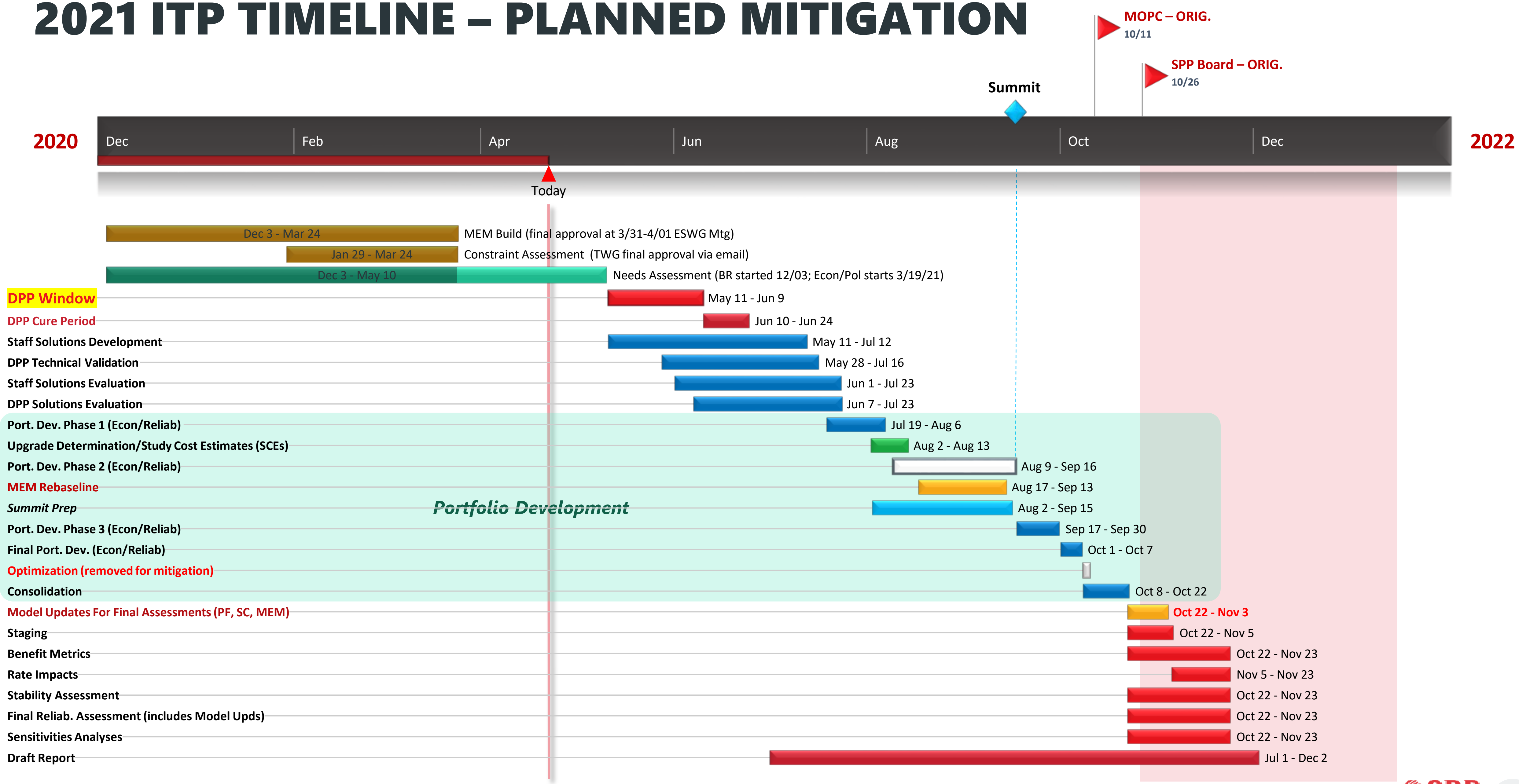
				completion and facilitate ESWG discussion **May:** Lessons learned have been incorporated in schedule slides
209	Create Revision Request to remove RPS table from the ITP Manual	December 2020	In Progress	**May:** RR approved in April MOPC
210	Create list of 20YA items to review	January 2021	In Progress	**May:** Review updated list on agenda. Some items on agenda for discussion

2021 ITP SCHEDULE

DARA SOLOMON

MAY 2021

2021 ITP TIMELINE – PLANNED MITIGATION



RENEWABLE POLICY REVIEW (COMPLETE)

- Start: 1/07/2020
- End: 4/02/2020 (Members' Final Approval)
- Member Review Time:
  - Renewable Policy 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

RESOURCE PLAN – PHASE 1 (COMPLETE)

- Start: 2/03/2020
- *End: 4/02/2020 (Members' Final Approval)*
- Updated End: 5/08/2020 (Members' 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*
  - *Updated RP1 for ESWG approval: 5/04/2020 – 5/08/2020 (5 days)*
  - ESWG Approval of RP1 SPS results: 5/08/2020
- Staff Leader: Ahmed M. Al Azzawi (AAlAzzawi@spp.org)
- Working Group Approval: ESWG

RENEWABLE POLICY REVIEW AND RESOURCE PLAN – PHASE 1

Description

- Renewable Policy Standards (RPS) are assessed for utilities within the SPP footprint utilizing percentages in Table 3 of Section 2.2.1.3 of the ITP Manual. For those utilities that span multiple states, the approved powerflow models and geographical information system (GIS) data will be used to calculate each utility's load obligation in the corresponding state for purposes of calculating mandates and goals
- Section 2.2.2.1.1 of ITP Manual: SPP shall develop a resource plan to meet renewable expectations for the region. This will include capacity as required through the renewable policy review, as well as capacity identified through criteria developed by SPP and stakeholders

Lessons Learned and Improvements

- Request each utility provide it's state goals with the objective of having a full list of impacts to utilities. Also, include columns for exclusions/exemptions, known laws and comments on any gaps for follow up. Utilize this data for the next study as well for reference
- Show calculations in the posted workbook on Globalscape – this worked well this cycle
- Utilize prior cycle's comments and accreditation rationale – this worked well this cycle
- Explore possibility to assume renewal or repower of expiring contracts
  - Existing or Set to Expire contracts may have firm service which provides incentives for contracts to be extended versus new contracts

RESOURCE PLAN – PHASE 2 (COMPLETE)

- Start: 2/03/2020
- End: 5/26/2020 (Members' Final Approval – Internal
- End: 8/21/2020 (External RP2 posted)
- Member Review Time:
  - *Preliminary Results: 4/03/2020 – 4/16/2020 (10 days)*
  - *Zonal Shortfalls: 4/28/2020 – 5/05/2020 (5 days)*
  - *Proposed Final Resource Plan: 5/01/2020 – 5/06/2020 (4 days)*
  - *Final Resource Plan Recommendation: 5/19/2020 – 5/26/2020 (5 days)*
  - *Final Internal Resource Plan - ESWG Approval: 5/26/2020*
  - External Resource Plan: Posted 8/21/2020
- Staff Leader: Kirk Hall (khall@spp.org)
- Working Group Approval: ESWG

RESOURCE PLAN – PHASE 2

Description

- Section 2.2.2.1.2 of ITP Manual: Each pricing zone shall be assessed for resource adequacy by accounting for load projections, existing generation, new wind and solar additions, capacity accreditation for all renewable units, fleet PPAs, and DC tie accreditations
- Each pricing zone's resource shortfall shall be computed based on the SPP reserve margin requirement in effect at the commencement of the resource planning milestone of the study

Lessons Learned and Improvements

- External entity resource planning was delayed due to additional effort need to line up MISO MTEP futures with SPP study years; solution for renewables was to interpolate amounts by site, and solution for conventionals was to pull forward year 10 and 15 incremental additions into the SPP year 10 model
- Prototypes limited in future studies based on software and engineering judgment; saved time in scope development and led to waiver for use of resource planning software in the 2021 ITP, saving time and money (previously done by consultants)

SITING PLAN (COMPLETE)

- Start: 4/20/2020
- End: 11/2/2020 (Members' Final Approval)
- Member Review Time:
  - *Site Repository: 5/21/2020 – 6/03/2020 (10 days)*
  - *Preliminary Siting Plan (Renewable): Post & Request Exceptions: 7/31/2020 – 8/13/2020*
  - *Site Assignment (Renewable) ESWG Review: 8/13/2020 – 8/19/2020 (5 days)*
  - *Site Assignment (Distributed Solar) Review: 8/17/2020 – 8/21/2020 (5 days)*
  - *Site Assignment (Renewable) & Exceptions: ESWG Review to Approve: 9/10/2020 – 9/16/2020 (5 days)*
  - *Site Assignment (Renewable/Distributed Solar): Updated/Reposted: 10/8/2020*
  - *Site Assignment (Renewable/Distributed Solar): ESWG Approval requested 10/21/2020 via email vote*
  - *Site Assignment (Conventional/Storage): Post & Request Exceptions: 10/23/2020 – 10/29/2020 (5 days)*
  - *Site Assignment (Conventional/Storage): Post for ESWG Approval: 10/29/2020 – 10/31/2020 (3 days)*
  - *Site Assignment (Conventional/Storage) ESWG Approval: 11/2/2020 requested via email vote*

- Staff Leaders: Joshua Norton (jnorton@spp.org)
- Working Group Approval: ESWG

GENERATOR OUTLET FACILITIES (GOFS) - (COMPLETE)

- Start: 4/9/2020
- End: 11/03/2020 (Members' Final Approval)

- Member Review Time:
  - *Preliminary Renewable GOFs: Post for stakeholder Review: 10/07/2020 – 10/13/2020 (5 days)*
  - *TWG Meeting Review: 10/06/2020*
  - *GOFs: Post for Final TWG Review to Approve: 10/27/2020 – 11/3/2020 (5 days)*
  - *GOFs: TWG Post to Review for Approval: 11/03/2020*
  - *GOFs: Stake holder Review to Approve: 11/4/2020 – 11/10/2020 (5 days)*
  - *GOFs TWG Request for Final Approval: 11/10/2020*

- Staff Leaders: Brooke Keene (bkeene@spp.org)

- Working Group Approval: TWG

SITING PLAN AND GENERATOR OUTLET FACILITIES (GOF)

Description

- Section 2.2.2.2 of ITP Manual for Siting Plan: The resource plan will identify resource additions that need to be sited to meet study objectives. A spatial location and electrical point of interconnection for each new resource within the SPP region will be selected. This effort will be conducted as a screening level exercise to identify sites and will not be intended to provide or replace a fully scoped power-plant siting study. Siting guidelines are documented in the Resource Siting Manual, which is owned and approved by ESWG and TWG
- Section 2.2.2.3 of ITP Manual for GOFs: Once the resource and siting plans have been finalized, SPP will reconsider the First Contingency Incremental Transfer Capability (FCITC) analysis completed during the siting process to develop any necessary GOFs. This GOF process is intended to proxy the evaluation of a resource in the generator interconnection process to develop necessary upgrades

Lessons Learned and Improvements

- Assess how much of the generation that was assigned upgrades is sited; include the cost of GOF in presentation to working groups
- Work on Site Repository earlier to solicit stakeholder feedback earlier in the process
- When posting in the repository plans, tapped lines will show the bus that will be selected for siting in the model. This will ensure stakeholder review this earlier in the process
- GOF analysis for Resource Addition Requests (RAR) and Waivers during Generation Review milestone (checking FCITC and Interconnection Agreements) - worked well this cycle
- Automation improvements created that helped with FCITC analysis

MARKET ECONOMIC MODEL BUILD (COMPLETE)

- Start: 12/01/2019
- End: 3/31/2021 (Members Final Approval)
- Member Review Time:
  - *Pass 1 (Year 2): 8/06/2020 – 8/14/2020 (6 days)*
  - *Pass 1 (Year 2) Updated: 8/24/2020 – 8/28/2020 (5 days)*
  - *Pass 1 (Year 2) Updated for Final Approval: 8/31/2020 – 9/04/2020 (5 days)*
  - *Pass 1 (Year 2) ESWG Final Approval: 9/04/2020*
  - *Pass 2 (Years 2/5/10): 1/13/2021 – 1/19/2021 (5 days)*
  - *Pass 2 (Years 2/5/10) Updated: 1/28/2021 – 2/4/2021 (5 days)*
  - *Final Market Economic Model: Posted for Final Approval: 3/23/2021 – 3/30/2021 (5 days)*
  - *Final Market Economic Model ESWG Final Approval: 3/31/2021*
- Staff Leader: Charlton Hill (chill@spp.org)
- Working Group Approval: ESWG

CONSTRAINT ASSESSMENT (COMPLETE)

- Start: 12/04/2020
- End: 4/1/2021 (Member's Final Approval)
- Member Review Time:
  - *Pass 1: Post for Stakeholder Review: 3/01/2021*
  - *Pass 1: TWG Review: 3/2/2021*
  - *Pass 2: Post for Stakeholder Review: 3/23/2021 – 3/29/2021 (5 days)*
  - Pass 2 (Final): TWG Approval via Email Request: (3/30/2021)

- Staff Leader: Ahmed M Al Azzawi (AAlAzzawi@spp.org)
- Working Group Approval: TWG

NEEDS ASSESSMENT

- Start: 11/18/2020
- End: 5/10/2021

- Staff Leaders:
  - BR Needs: Joshua Pilgrim (jpilgrim@spp.org)
  - Econ/Policy Needs: Maurisa Hughes (mghughes@spp.org)
  - Short-Circuit Needs: Nathan Bean (nbean@spp.org)
  - Operational Needs: Will Tootle (wtootle@spp.org)

DPP WINDOW

- Start: 5/11/2021 12:00 a.m.
- End: 6/9/2021 11:59 p.m.

- Member Review Time:
  - Transmission-planning response window (30 calendar days)

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

STAFF SOLUTIONS DEVELOPMENT

- Start: 5/11/2021
- End: 7/12/2021

- Staff Leader: Krishada Watson (kwatson@spp.org)

DPP TECHNICAL VALIDATION

- Start: 5/28/2021
- End: 7/16/2021

- Staff Leader: Jake Morris (jmorris@spp.org)

SOLUTIONS EVALUATION

- Start: 6/1/2021
- End: 7/23/2021

- Staff Leaders:
  - Reliability: Jacob Pannell (jpannell@spp.org)
  - Economic/Policy: Spencer Magby (smagby@spp.org)
  - Short Circuit: Nathan Bean (nbean@spp.org)

RELIABILITY PORTFOLIO DEVELOPMENT

- Start: 7/19/2021
- End: 10/7/2021

- Staff Leader: Maurisa Hughes (mghughes@spp.org)

ECONOMIC PORTFOLIO DEVELOPMENT (PROJECT GROUPING)

- Start: 7/19/2021
- End: 10/7/2021

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

PLANNING SUMMIT

- September 2021 – Date TBD
- Staff Leader: Tammy Bright (tbright@spp.org)

PORTFOLIO CONSOLIDATION

- Start: 10/8/2021
- End: 10/29/2021

- Member Review Time:
  - *TBD*

- Staff Leader: Jacob Pannell (jpannell@spp.org)

PROJECT STAGING

- Start: 10/22/2021
- End: 11/5/2021

- Staff Leader: Jake Morris (jmorris@spp.org)

BENEFIT METRICS CALCULATION

- Start: 10/22/2021
- End: 11/23/2021

- Staff Leader: Krishada Watson (kwatson@spp.org)

STABILITY ANALYSIS

- Start: 10/22/2021
- End: 11/23/2021

- Staff Leader: Maurisa Hughes (mghughes@spp.org)

SENSITIVITY ANALYSIS

- Start: 10/22/2021
- End: 11/23/2021

- Staff Leader: Greg Lampley (glampley@spp.org)

FINAL RELIABILITY ASSESSMENT

- Start: 10/22/2021
- End: 11/23/2021

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

RATE IMPACTS/ATRR

- Start: 11/5/2021
- End: 11/23/2021

- Staff Leader: Krishada Watson (kwatson@spp.org)

FINAL REPORT

- Start: 10/1/2021
- End: 12/2/2021

  - Final ESWG/TWG Approval TBD

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

TWG/ESWG FINAL APPROVALS

- Start: 12/2021
- End: 12/2021

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

MOPC AND SPP BOARD APPROVALS

- MOPC: TBD
- SPP Board: TBD

CONTACT INFO

Dara Solomon, SPP Staff

dsolomon@spp.org

2021 ITP MARKET ECONOMIC MODEL

CHARLTON HILL

MAY 2021

OBJECTIVE

- Provide 2021 ITP Market Economic Models (MEM) Update
- Next Steps

UPDATE

- Model Issue
  - Subset of DC line flow limits not ideal for Years 5 and 10 MEM
- Lessons Learned
  - Use scripting tool to add cases to PROMOD scenarios
  - Check database after subscribing cases
- No significant zonal or regional adjusted production cost impacts
- Congestion (constraint-specific) Impacts
  - Bakken Target Area
  - MISO footprint near the SPP seam

NEXT STEPS

- SPP plans to incorporate the DC line operation changes to the 2021 ITP MEM re-baseline

Southwest Power Pool

2021 **ITP**

2021 ITP TARGET AREA UPDATE

SPP STAFF

MAY 2021 ESWG/TWG

OVERVIEW

- Target Area Scope Structure
- Target Area Summary
- Target Area Sensitivity Models and Needs
- SPSNMTIES Interface Discussion
- Target Area Informational Needs and Additional Analysis (optional)
- Next Steps

2021 **ITP**

TARGET AREA SCOPE STRUCTURE

TARGET AREA SCOPE STRUCTURE

- Background and definition
- Reliability and economic models and needs
  - Base model and needs, additional model and needs, and informational needs
- Reliability evaluation and economic evaluation
  - Base, additional analysis/considerations, and additional analysis/considerations for informational needs (as needed)
- Stability evaluation (as needed)
- Schedule

2021 **ITP**

TARGET AREA SUMMARY

BAKKEN TARGET AREA

- Background
  - 2016 ITP Near-Term Kummer Ridge - Roundup 345 kV circuit 1 approval and subsequent withdrawal
  - 2019 and 2020 ITP persistent economic operational issue (informational)
  - MOPC action item to assess increased load growth and cold weather-driven scenarios and contingencies
  - EPRI Risk-based planning assessment area of focus
  - Base reliability (BR) thermal and voltage collapse conditions and Market Economic Model (MEM) congestion

Challenge	Opportunity
2021 BR Year 10 Winter model includes 2 proxy static var compensators (SVCs)	Provide instructions for Detailed Project Proposals (DPPs) to include commands to inactivate SVCs
Bakken Load forecast higher than expected in 2021 ITP BR model	Introduce BR and Economic Low Load Sensitivity Model and Needs into portfolio development and project recommendation process

SPS SOUTH TARGET AREA

- Background
  - High Priority Incremental Load Study load and transmission additions, 2017 ITP10 Additional Analysis for Potter to Tolk 345 kV line recommendation, Attachment AQ load and transmission additions
  - 2020 ITP reliability and economic assessment conclusion to use 2021 ITP to address uncertainties in eastern New Mexico
  - BR thermal and voltage collapse conditions and MEM congestion
  - BR SPS New Mexico Ties (SPSNMTIES) Interface violations and MEM congestion as proxy for marginal voltage stability limit

Challenge	Opportunity
2021 BR Year 10 Summer model includes 1 proxy SVC	Provide 2021 BR Year 10 Summer model and SPS Needs without SVC
SPSNMTIES Interface BR violations and MEM congestion	Introduce Base Reliability SPSNMTIES Base and Incremental Transfer Analysis Sensitivity Models and Needs to proxy PV analysis into portfolio development and project recommendation process
MEM assumes significant EHV GOF in the area with load serving and economic energy delivery qualities to support the 2021 ITP Resource Plan Combined Cycle Plant	Introduce MEM Low Retirement Sensitivity Model and Needs without GOF and Combined Cycle Plant into portfolio development and project recommendation process

2021 **ITP**

TARGET AREA SENSITIVITY MODELS AND NEEDS

BASE RELIABILITY SENSITIVITY MODELS AND NEEDS

- Bakken
  - BR low load sensitivity model and needs
    - Perform base reliability needs assessment on 2022 ITP BR models
    - To address significant Bakken load forecast changes for project construction recommendations

BASE RELIABILITY SENSITIVITY MODELS AND NEEDS

- SPS South
  - BR base transfer analysis sensitivity models and needs
    - For SPSNMTIES BR violations, SPP staff will perform additional N-1 contingency analysis on adjusted models with the Mustang plant at a minimum of 400 MW consistent with how the interface limits were determined using 0.02 voltage safety margin
    - Proxies PV analysis for SPSNMTIES interface base transfer
  - BR incremental transfer analysis sensitivity models and needs
    - For SPSNMTIES interface congestion, SPP staff will develop an Interface Guidelines and Study Scope for interface solution evaluation similar to the 2020 ITP
    - Proxies PV analysis for SPSNMTIES interface incremental transfers

ECONOMIC SENSITIVITY MODELS AND NEEDS

- Bakken and SPS South
  - MEM sensitivity model and needs
    - Includes low load sensitivity for Bakken
      - Addresses Bakken load forecast changes for project construction recommendations
    - Includes low retirement sensitivity for SPS South without generator outlet facility (GOF) and combined cycle plant
      - Addresses GOF and combined cycle plant assumption uncertainties and difference between BR model and need drivers, and MEM and need drivers to support solution development milestones to integrate BR, economic, and GOF solutions; and
      - Captures additional adjusted production cost (APC) savings for portfolio development and project recommendation process

TARGET AREA SENSITIVITY MODELS AND NEEDS

- BR sensitivity models take priority over economic sensitivity models
- SPP staff is still evaluating how best to incorporate economic sensitivity models into economic needs assessment and portfolio development
- Target Area Scope will provide details and instructions for staff and stakeholders

SPSNMTIES INTERFACE DISCUSSION

BACKGROUND

- SPSNMTIES interface base reliability violation and congestion limiting firm and non-firm economic transfer of energy into area
- 2021 ITP – New Mexico Ties Interface Guidelines and Study Scope

ADDITIONAL SOLUTION EVALUATION ANALYSIS

- 2021 ITP – SPS New Mexico Ties Interface Guidelines and Study Scope
  - BR base and incremental transfer analysis sensitivity models thermal and voltage analysis with 0.02 p.u. voltage safety margin applied to low voltage monitoring criteria
- Economic solution evaluation
  - APC screening by diverting flow away from interface for DPPs without study scope pass or fail analysis
  - APC screening with adjusted interface rating for DPPs with study scope pass or fail analysis
- Reliability solution evaluation
  - Cost per loading relief and cost per voltage relief reliability metrics screening using study scope base and incremental transfer models and violations to identify top-ranked solutions needing further review

POTENTIAL SOLUTIONS

- Solving the SPSNMTIES Interface will require a comprehensive solution considering improving import capability and addressing lack of reactive support in the area due to existing firm transfers and increased transfers of economic energy

2021 **ITP**

TARGET AREA INFORMATIONAL NEEDS AND ADDITIONAL ANALYSIS (OPTIONAL)

TARGET AREA INFORMATIONAL NEEDS AND ADDITIONAL ANALYSIS (OPTIONAL)

- Bakken and SPS South
  - Higher order planning events that allow for non-consequential load loss (NCLL)
  - Evaluate how well top solutions reduce severity and NCLL for risk-based planning initiative
- Bakken
  - Cold weather-driven scenarios and contingencies
  - Evaluate how well top solutions reduce severity and NCLL for risk-based planning initiative
- SPS South
  - Perform PV and QV analysis on top solutions using BR base and incremental transfer sensitivity models

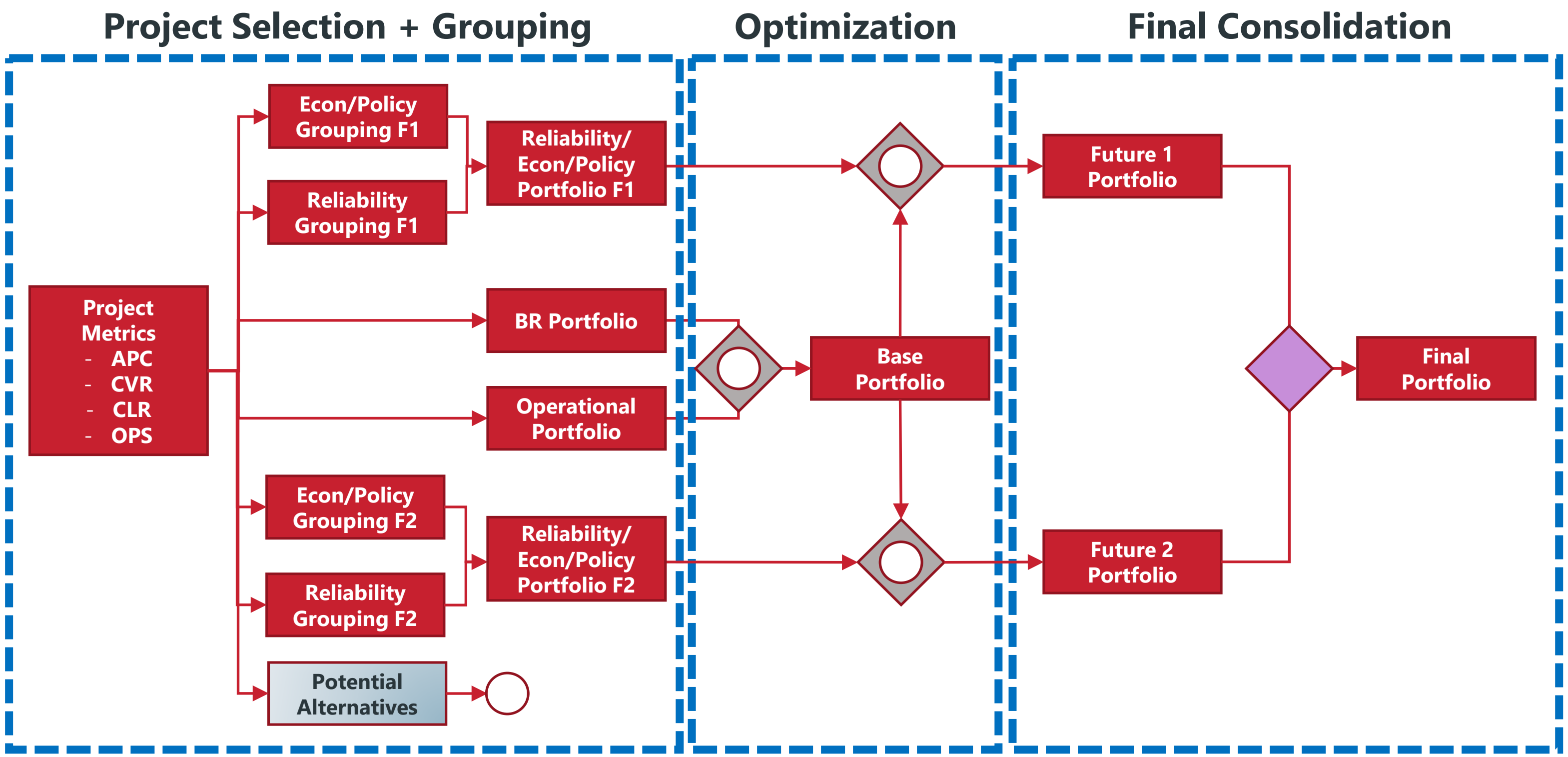
NEXT STEPS

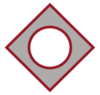
NEXT STEPS

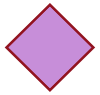
- Finalize Target Area Scope prior to DPP window
- Anticipate and prepare for additional portfolio development policy and technical challenges

APPENDIX

PORTFOLIO DEVELOPMENT




Optimization with consideration of potential alternatives


Individual project review including assessment of unmet needs

2021 ITP ECONOMIC NEEDS ASSESSMENT

MAURISA HUGHES

MAY 2021 ESWG

OVERVIEW

- 2021 Economic Needs Assessment Update

ECONOMIC NEEDS ASSESSMENT UPDATE

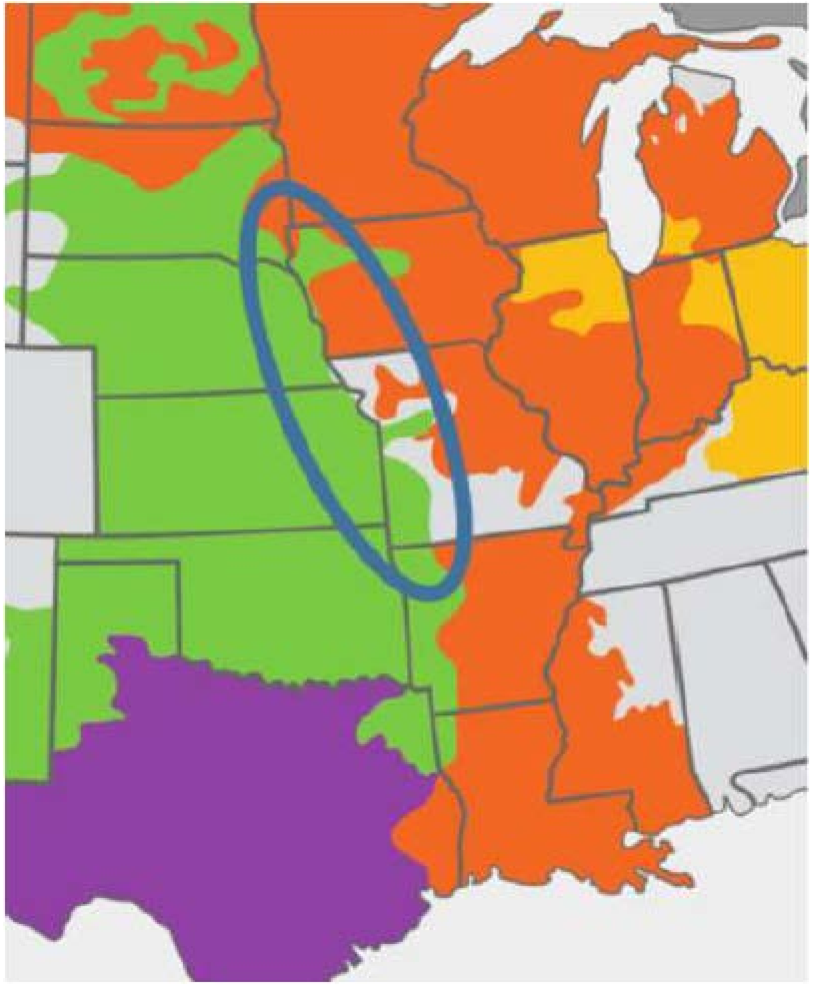
ECONOMIC NEEDS CRITERIA

- Due to 2021 ITP mitigation, the TWG and ESWG approved a reduced scope of the Economic Needs Assessment, limiting Economic needs to a set of constraints that meets specific considerations.

FLOWGATE CONSIDERATIONS

- As flowgates have been analyzed, any of the following considerations have been used to decide if a flowgate should qualify as an economic need in the 2021 ITP
  - The flowgate has a congestion score of at least $200K/MW
  - The flowgate was also identified by the JTIQ and is also in the "corridor of interest"
  - The flowgate was also identified as a Reliability or Operational need
  - The flowgate is terminally limited & not significantly related to a bulk voltage issue

JTIQ CORRIDOR OF INTEREST



FLOWGATE CONSIDERATIONS

- The following considerations were used to exclude flowgates from becoming needs in the 2021 ITP
  - Relaxation Run shows low quantitative value to relieving the congestion
  - Same congestion was seen in previous ITP analysis on a given flowgate
  - The flowgate was identified as being better suited for 2022 ITP and 20 Year analysis
  - The congestion trended downward, indicating existing system changes would relieve the congestion

CONGESTED FLOWGATES

Flowgates	Draft Quantity*
Experiencing a congestion score >= $200K/MW	11
Also identified by the JTIQ Study	Still exchanging data with MISO
Located in Bakken Target Area	8
Located in SPS South Target Area	3
Also identified by the Reliability Needs Assessment	9
Also identified by the Operational Needs Assessment	3

*These categories are not mutually exclusive. A single flowgate may be represented in multiple rows.

QUESTIONS?

SPP Southwest Power Pool

2021 ITP SUMMIT DISCUSSION

KIRK HALL

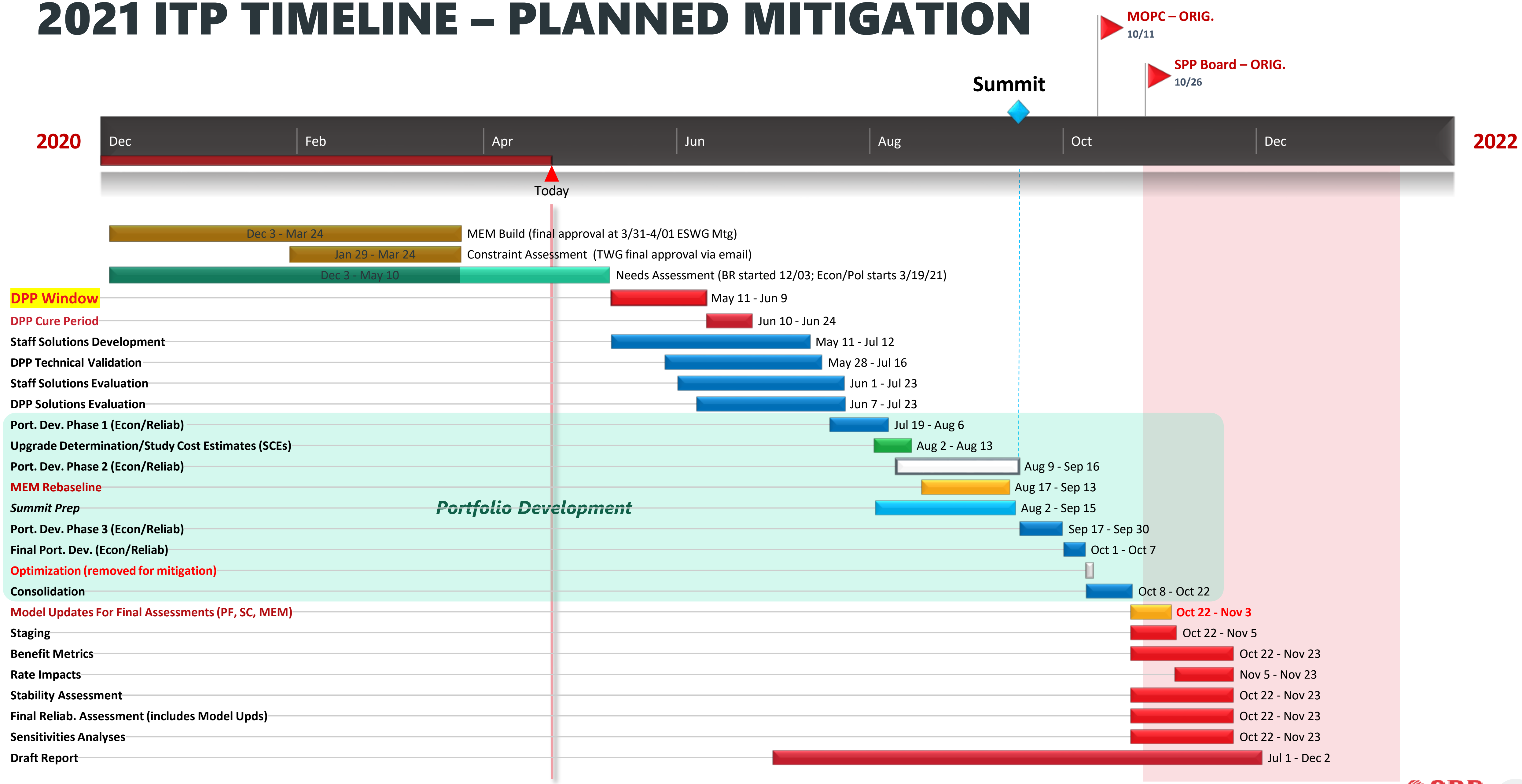
SUMMIT DATE MOVE

- SCRIPT Decision Quality sub-team discussed the value of the current planning summit scheduling and format
- Over the last few ITPs, the planning summit has occurred between Phase 1 and 2 of grouping
  - Project selection is in early phases and cost estimates likely just received
- DQ sub-team discussed using the summit as a way to educate stakeholders on the final groupings and recommended portfolio by moving the Summit back later in the ITP schedule to Phase 3 or 4 of Project Grouping

EFFECTS OF MOVING THE SUMMIT TO A LATER DATE

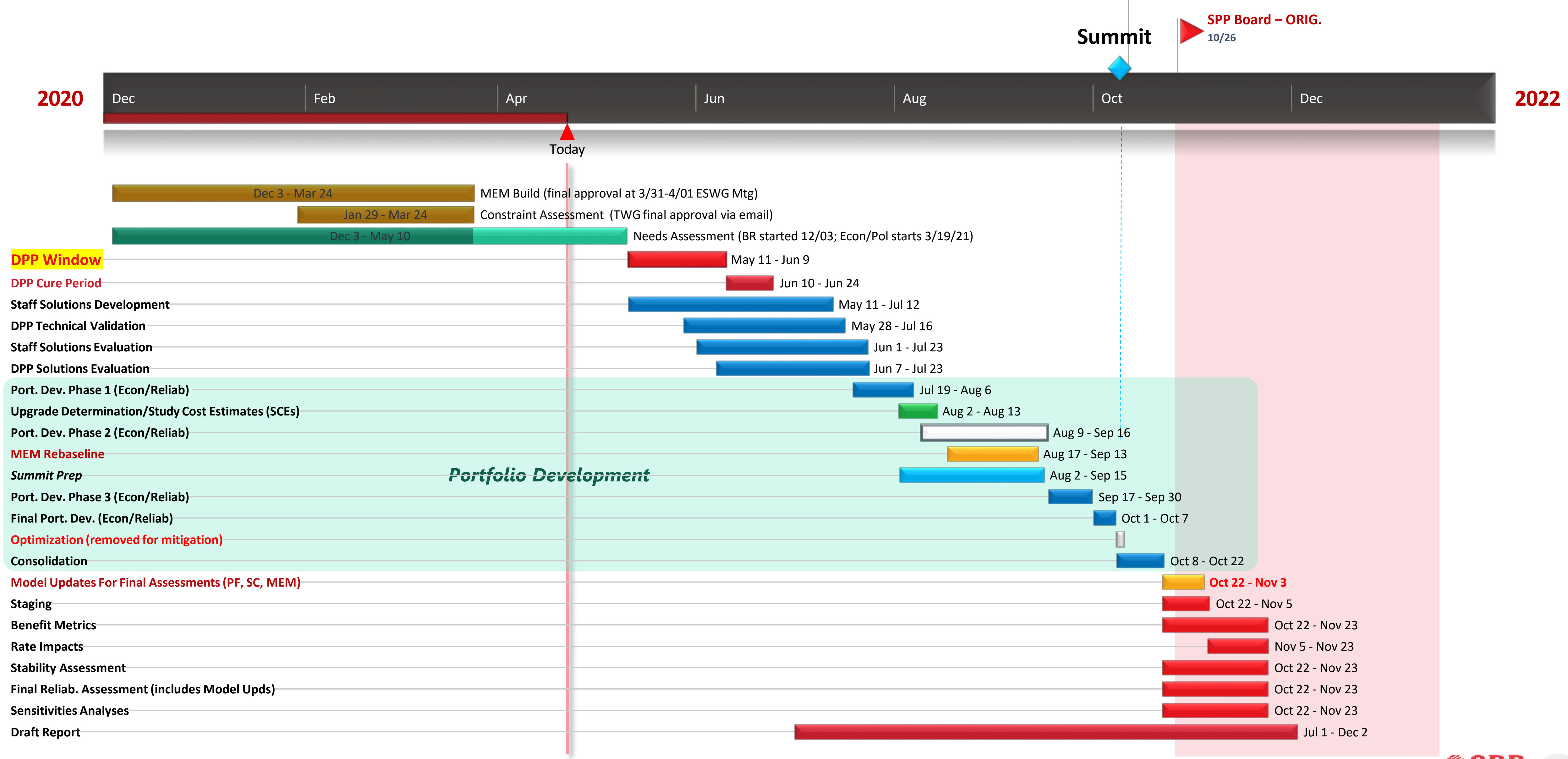
- Summit can be used to educate MOPC level stakeholders on the final groupings and recommended projects
  - Still able to request feedback on high-performing solutions
  - Time available to make any necessary changes based upon feedback
- Before making a decision to move the date, staff wanted to discuss with working group members and get feedback.

2021 ITP TIMELINE – PLANNED MITIGATION



SPP

2021 ITP TIMELINE – PLANNED MITIGATION



2021 AND 2022 ITP PERSISTENT ECONOMIC OPERATIONAL SOLUTION EVALUATIONS

MAY 2021 ESWG/TWG

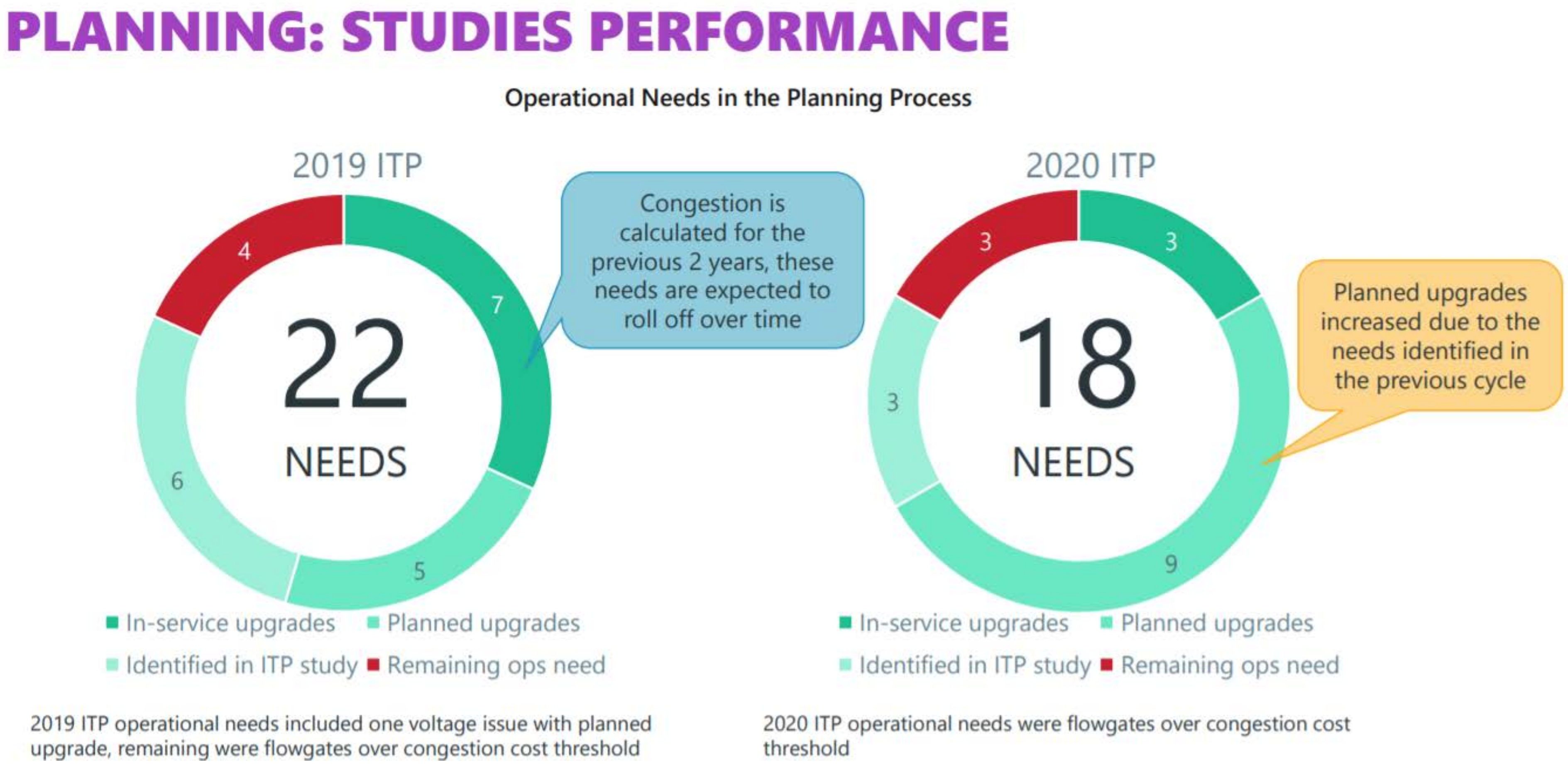
SPP STAFF

OBJECTIVE

- Review Key Performance Indicator (KPI) from Q1 2021 Joint Quarterly Stakeholder Meeting
- Provide Quarterly 2021 ITP Market Economic Model (MEM) and Operations congestion comparisons
- Update on the 2021 ITP persistent operational economic solution evaluation efforts

REVIEW KEY PERFORMANCE INDICATOR (KPI) FROM Q1 2021 JOINT QUARTERLY STAKEHOLDER MEETING

KEY PERFORMANCE INDICATOR (KPI) – KEEP LIGHTS ON IN FUTURE



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CONGESTION COMPARISON DIFFERENCES DISCUSSION AND POTENTIAL RESOLUTION

POTENTIAL ECONOMIC OPERATIONAL NEED

Monitored Element	Contingent Element	Real-Time Congestion Cost (2 year)	2021 ITP Planning Congestion Cost (1 year)	2021 ITP Planning Congestion Score (1 year)	Potential Resolution
LN Midwest - Franklin 138 kV	LN Cedar Lane - Canadian 138 kV	$71M	F1 Y2 $0M F1 Y5 $0.2M F1 Y10 $0.6M F2 Y5 $0.5M F2 Y10 $0.4M	F1 Y2 $0k F1 Y5 $0.1k F1 Y10 $2k F2 Y5 $1.6k F2 Y10 $1.2k	• 2020 ITP Approved Project modeled in Year 5 using Summer Rating Only • 2021 ITP Assessment to Acceleration Approved Project

- Operation congestion for flowgates having congestion costs totaling more than $10 million over the previous 24 months 12/1/18-12/1/20
- Planning congestion from the 2021 ITP Market Economic Model (MEM)
- Congestion Differences Hypothesis
  - Differences in Integrated Market and Planning Software SCUC/SCED
  - Real-time generation cost versus Planning assumption generation cost
  - Higher than expected counterflows from Planning wind dispatch assumptions
- Resolution to address as part of 2021 ITP
  - Evaluate Least Cost Solution for Franklin to Midwest
  - Use SPP Regional Benefit from historic Real-Time Operation data to justify accelerating project as part of the 2021 ITP solution and portfolio development milestones

2021 ITP PERSISTENT OPERATIONAL ECONOMIC SOLUTION EVALUATION EFFORTS

NEXT STEPS

- Discuss options and recommend approach using historic real-time operation congestion and/or data to justify accelerating less than $100k terminal upgrade project to uprate Midwest to Franklin 138 kV as part of the 2021 ITP solution and portfolio development milestones
- Provide operation congestion caused by prior outage for informational purposes

APPENDIX

ITP MANUAL
SECTION 4.4 PERSISTENT OPERATIONAL NEEDS ASSESSMENT

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[41] 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.

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.

ITP MANUAL
SECTION 5.3 SOLUTION EVALUATION PROCESS

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. SPP will track congested economic operational needs against needs identified in the current ITP, identify differences between real-time market operations and planning models, and determine the need for and impact of planning model adjustments and analysis. SPP will make a recommendation to applicable stakeholder working groups on how to address unresolved economic operational needs. Recommendations may include transmission upgrades, operational mitigations, or additional analysis to be performed in a future ITP study.

2022 ITP IMPLEMENTATION

2022 ITP ASSESSMENT SCOPE

SECTION 3: SOLUTION EVALUATION & PORTFOLIO DEVELOPMENT

PERSISTENT ECONOMIC OPERATIONAL SOLUTION EVALUATIONS

FLOWGATES

Leading up to the 2022 ITP needs assessment, SPP will leverage the 2021 ITP economic operational needs assessment and solution evaluation outcome and continue to track on a quarterly basis operations and planning congestion throughout the 2021 ITP. SPP will make a recommendation to working groups on whether or not to address on as needed basis new and unresolved persistent operation economic congestion remaining after 2021 ITP persistent operation needs assessment and solution evaluation.

SPP Southwest Power Pool

20-YEAR ASSESSMENT LOAD AND GENERATION REVIEWS

BROOKE KEENE

ENERGY EFFICIENCY

- Model as an “across-the-board” reduction in energy and demand consumption
- Trends to overall energy intensity forecast in the 2021AEO
  - Residential customers reduce intensity 12% by 2050
  - Commercial customers reduce intensity 8% by 2050
  - Industrial customers reduce intensity 18% by 2050
- SPP Load Percentages-based on NERC/MRO compliance initiative
  - Residential: 56.47%
  - Commercial: 26.96%
  - Industrial: 16.57%

ENERGY EFFICIENCY

- Residential energy growth is primarily due to space heating growth and EV
  - Energy efficiency is accounted for in Demand Response and load addition valley-fill option
- Reduce energy for commercial and industrial loads only
- **SPP Recommends: 3.8% reduction**

LOAD REVIEW NOTES

- Feedback received was incorporated in F1/F2 2042 Peak Load values
  - No exceptions were received
- F3/F4 2042 peak load values will be determined during the MEM build
- F3/F4 Annual Energy incorporates EV growth, space heating additions including the DR associated, and energy efficiency (assuming 3.8%)
- For Reference:
  - F2 EV Energy (50% fleet adoption): 13,150 GWh
  - F3/F4 EV Energy (60% fleet adoption): 15,779 GWh

GENERATION REVIEW NOTES

- Retirements are the only difference between 2022 ITP Generation Review and 20-Year Assessment Generation Review
  - All Coal retired
  - All Oil retired
  - More Gas retirements than F2
- RARs/Waivers carry forwards and will be included in 20-Year Assessment
- More gas retirements will be considered at a later time when evaluating emissions targets

RECOMMENDATION

- SPP recommends approving the energy efficiency value as presented
- SPP recommends the ESWG approve the Load and Generation Review workbooks for use in the 20-Year Assessment

20-YEAR ASSESSMENT – SCOPE AND STUDY EXECUTION ACTION ITEMS

SHERRI MAXEY

MAY 2021

OVERVIEW

- Staff's Approach
- Action Items identified – Updates from April ESWG presentation shown in red

STAFF'S APPROACH

- Purpose: Identify 20-Year Assessment scope and study execution items to be addressed with stakeholders
- Action: Take chronological approach by ITP study milestone
- Goal: Bring back 1-2 months prior to start of milestone work for stakeholder discussion and decision

ACTION ITEMS

ID	Description	Milestone(s)	Status Update
1	Load growth distribution and approach to non-conforming load (partial overlap with item 2)	Powerflow Models / Load Review	*Completed*
2	Implementing future drivers in generation and load review, and market economic model (MEM) Supply side items: • Emissions target and gas retirements (F3/F4), modeling and monitoring • Electric storage additions - transmission, energy or capacity asset, or all of the above? ✓ Distributed resource forecasts and modeling • Fuel forecasts extrapolation and adjustments Demand side items: ✓ Load shape changes (will complete in MEM) ✓ General electrification (*eg.*, 20YR - F3/F4) ✓ Electric vehicle growth and distribution ✓ Demand response • Energy efficiency	Generation and Load Review / Resource Plan (RP2) / MEM	*In progress – partially complete* *Completed:* ✓ Load shape changes *(2042 peak load values will be determined during MEM build)* ✓ General electrification ✓ Electric vehicle growth and distribution ✓ Demand response
3	Renewable Pricing and PTC assumptions/expirations	Generation Review / RP2 / MEM	*In progress*

ACTION ITEMS – CONT.

ID	Description	Milestone(s)	Status Update
4	Renewable policy extrapolation	Renewable Policy Review	*In progress*
5	Possible use of resource planning software in 20-Year Assessment; or should we adjust the traditional resource additions?	RP2	*In progress*
6	Renewable and storage ownership, and accreditation assignment; CT-to-CC ratio; ELCC implementation	RP2	*In progress*
7	Identification of additional batteries beyond F1 and F2 scoped amounts (requires Scope change); including hybrid issues	RP2	*In progress*
8	External region resource plan and siting approaches	RP2	*In progress*
9	Review 12% cap on renewables for reserve margin requirements	RP2	*In progress*
10	Renewable accreditation	RP2	*In progress*
11	Determine resource addition strategy	Siting / Generator Outlet Facilities (GOFs) / Constraint Assessment	*In progress*

ACTION ITEMS – CONT.

ID	Description	Milestone(s)	Status Update
12	EPRI transmission capacity hosting tool/SPP initiative for siting	Siting / GOFs / Constraint Assessment	*In progress*
13	Hybrid Solar/Renewable and Battery Modeling and GI Surplus Capacity	Siting / MEM	*In progress*
14	Constraint Assessment on each future; come up with EHV portfolio; monitor everything 100 kV and above? Not clear how that will be done so request to bring that methodology review back	Constraint Assessment	
15	20-Year objective function for developing portfolios by future • Approaches to non-SPP APC savings benefits (*eg.*, SPP-Other, SPP economy export APC savings benefits to non-SPP regions) • Approach to seams issues and solutions	Portfolio Development	
16	HV and EHV needs versus HV and EHV solution tradeoffs	Portfolio Development	
17	Identification of sensitivities	Sensitivity Analysis	

Southwest Power Pool

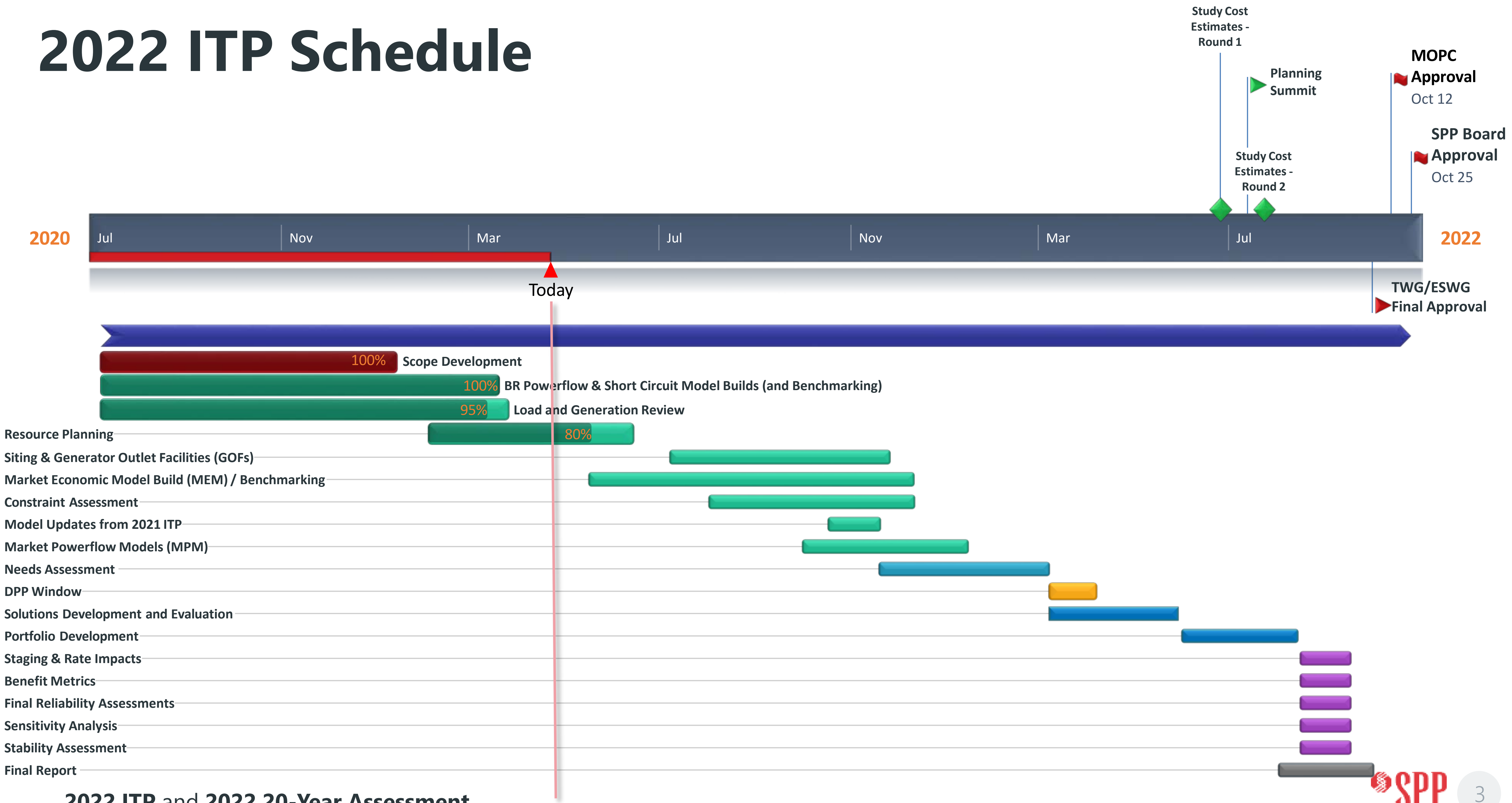
2022 ITP AND 20-YEAR ASSESSMENT SCHEDULES

DARA SOLOMON

MAY 2021

2022 ITP

2022 ITP Schedule



2022 ITP and **2022 20-Year Assessment**

BASE RELIABILITY POWERFLOW & SHORT CIRCUIT MODELS

- Start: 7/06/2019
- Initial Final Approval: 3/12/2021 (BR Powerflow) & 3/19/2021 (Short-Circuit)
- Final Approvals: TBD

- Member Review Time:
  - *Pass 0 – Trial 1 (Posting: 7/17/2020): 7/20/2020 – 7/24/2020 (5 days)*
  - *Pass 0 – Trial 2 (Posting: 8/07/2020): 8/10/2020 – 8/28/2020 (15 days)*
  - *Pass 1 – Trial 1 (Posting: 9/25/2020): 9/28/2020 – 10/16/2020 (15 days)*
  - *Pass 1- Trial 1 (Short Circuit) (Posting: 9/29/2020): 9/30/2020 – 10/16/2020 (13 days)*
  - *Pass 1 – Trial 2 (Posting: 11/13/2020): 11/16/2020 – 12/11/2020 (20 days)*
  - Final Submission Deadline: 12/11/2020*
  - *Pass 2 (Posting: 1/15/2021): 1/18/2021 – 2/05/2021 (15 days)*
  - Final Submission Deadline: 2/05/2021**
  - *Final Initial ITP (Posting: 2/05/2021): 2/08/2021 – 2/19/2021 (10 days)*
  - *Final Initial BR Powerflow & Short-Circuit TWG Approval (Posting: 3/05/2021): 3/08/2021 – 3/12/2021 (5 days)*
  - *Final BR Powerflow TWG Approval: 3/31*
  - Final Initial Final Short-Circuit TWG Approval: 4/26/2021

- Staff Leader: David Duhart (dduhart@spp.org)
- Working Group Approval: TWG

* **Data Submitters** – Final Submission of Generator Additions, Retirements, Pmin & Pmax, Loads, and Interchange Corrections through MOD & EDST

** **Data Submitters** – Final Submission of Generation Dispatch, Docucheck Corrections, MOD-033 Feedback & Topology data updates through MOD & EDST

LOAD REVIEW (COMPLETE)

- Start: 8/1/2020
- End: 3/22/2021 (Member's Final Approval)
- Member Review Time:
  - *Load Pass 1 – Trial 1: (Posting: 10/02/2020) 10/05/2020 – 10/16/2020 (10 days)*
  - *Load Pass 1 – Trial 2: (Posting: 11/20/2020) 11/23/2020 – 12/11/2020 (13 days)*
  - *Final Submission Deadline: 12/11/2020**
  - *Load Pass 2: (Posting: 1/22/2021) 1/25/2021 – 2/5/2021 (10 days)*
  - *Final Posting for Approval: 3/12/2021*
  - Final Load Pass – Stakeholder Review: 3/15/2021 – 3/19/2021 (5 days)
  - **Final ESWG Approval: 3/19/2021**
- Staff Leader: Brooke Keene (bkeene@spp.org)
- Working Group Approval: ESWG

GENERATION REVIEW (COMPLETE)

- Start: 8/1/2020
- End: 3/22/2021 (Member's Final Approval)
- Member Review Time:
  - *Generation Pass 1 – Trial 1: (Posting: 10/02/2020) 10/05/2020 – 10/16/2020 (10 days)*
  - *RAR & Waiver Request to Stakeholders: (Posting: 10/02/2020) 10/05/2020 – 10/16/2020 (10 days)*
  - *Generation Pass 1 – Trial 2: (Posting: 11/20/2020) 11/23/2020 – 12/11/2020 (13 days)*
  - *Final Submission Deadline: 12/11/2020**
  - *Generation Pass 2: (Posting: 1/22/2021) 1/25/2021 – 2/5/2021 (10 days)*
  - *Final Posting for Approval: 3/12/2021*
  - *Final Generation Pass – Stakeholder Review: 3/15/2021 – 3/19/2021 (5 days)*
  - **Final ESWG Approval: 3/19/2021**
- Staff Leader: Brooke Keene (bkeene@spp.org)
- Working Group Approval: ESWG

RENEWABLE POLICY REVIEW

- Start: 2/01/2021
- End: 4/21/2021 (Members' Final Approval)

- Staff Leader: Krishada Watson (kwatson@spp.org)
- Working Group Approval: ESWG

RESOURCE PLAN – PHASE 1 (COMPLETE)

- Start: 2/06/2021
- End: 4/21/2021 (Members' Final Approval)

- Staff Leader: Krishada Watson (kwatson@spp.org)
- Working Group Approval: ESWG

RESOURCE PLAN – PHASE 2

- Start: 2/06/2021
- End: 5/5/2021 (Members' Final Approval)

- Staff Leader: Antonio Barber (abarber@spp.org)
- Working Group Approval: ESWG

SITING PLAN & GENERATOR OUTLET FACILITIES (GOFS)

- Start: 4/12/2021
- End: 9/7/2021 (Members' Final Approval)

- Staff Leader: Josh Norton (jnorton@spp.org)
- Staff Leader: Greg Lampley (glampley@spp.org)

- Working Group Approval: ESWG

MARKET ECONOMIC MODEL BUILD

- Start: 10/01/2020
- End: 12/10/2021 (Members' Initial Final Approval)

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

MARKET ECONOMIC BENCHMARKING

- Start: 5/13/2021
- End: 7/18/2021 (Members' Final Approval)

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

CONSTRAINT ASSESSMENT

- Start: 08/02/2021
- End: 12/10/2021 (Member's Final Approval)

- Staff Leader: Neeya Toleman (ntoleman@spp.org)
- Working Group Approval: TWG

MARKET POWERFLOW MODELS (MPM)

- Start: 11/15/2021
- End: 1/14/2022 (Member's Final Approval)

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

NEEDS ASSESSMENT

- Start: 11/18/2021
- End: 3/08/2022

- Staff Leaders:
  - BR and MP Needs: Maurisa Hughes (mhughes@spp.org)
  - Econ/Policy Needs: Greg Lampley (glampley@spp.org)
  - Short-Circuit Needs: Nathan Bean (nbean@spp.org)
  - Operational Needs: Will Tootle (wtootle@spp.org)

DETAILED PROJECT PROPOSAL (DPP) WINDOW

- Start: 3/09/2022 12:00 a.m.
- End: 4/07/2022 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: 3/09/2022
- End: 5/10/2022

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

SOLUTIONS EVALUATION

- Start: 3/23/2022
- End: 6/03/2022

- Staff Leaders:
  - Reliability: Jake Morris (jmorris@spp.org)
  - Economic/Policy: Greg Lampley (glampley@spp.org)
  - Operational: Will Tootle (wtootle@spp.org)
  - Short Circuit: Nathan Bean (nbean@spp.org)

RELIABILITY PORTFOLIO DEVELOPMENT

- Start: 5/27/2022
- End: 8/01/2022

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

ECONOMIC PORTFOLIO DEVELOPMENT (PROJECT GROUPING)

- Start: 5/27/2022
- End: 8/01/2022

- Staff Leader: Joshua Pilgrim (jpilgrim@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)

OPTIMIZATION

- Start: 8/02/2022
- End: 8/08/2022

- Staff Leaders: Krishada Watson (kwatson@spp.org)

PORTFOLIO CONSOLIDATION

- Start: 8/09/2022
- End: 8/22/2022

- Staff Leaders: Jake Morris (jmorris@spp.org)

PROJECT STAGING

- Start: 8/23/2022
- End: 9/02/2022

- Staff Leader: Greg Lampley (glampley@spp.org)

BENEFIT METRICS CALCULATION

- Start: 8/23/2022
- End: 9/21/2022

- Staff Leader: Jake Morris (jmorris@spp.org)

STABILITY ANALYSIS

- Start: 8/23/2022
- End: 9/21/2022

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

SENSITIVITY ANALYSIS

- Start: 8/23/2022
- End: 9/21/2022

- Staff Leader: Jacob Pannell (jpannell@spp.org)

FINAL RELIABILITY ASSESSMENT

- Start: 8/23/2022
- End: 9/21/2022

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

RATE IMPACTS/ATRR

- Start: 9/02/2022
- End: 9/16/2022

- Staff Leader: Jake Morris (jmorris@spp.org)

FINAL REPORT

- Start: 5/01/2022
- End: 10/01/2022
- Member Review:
  - Final ESWG/TWG Approval in Sept. 2022

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

TWG/ESWG FINAL APPROVALS

- Start: 9/21/2022
- End: 10/01/2022

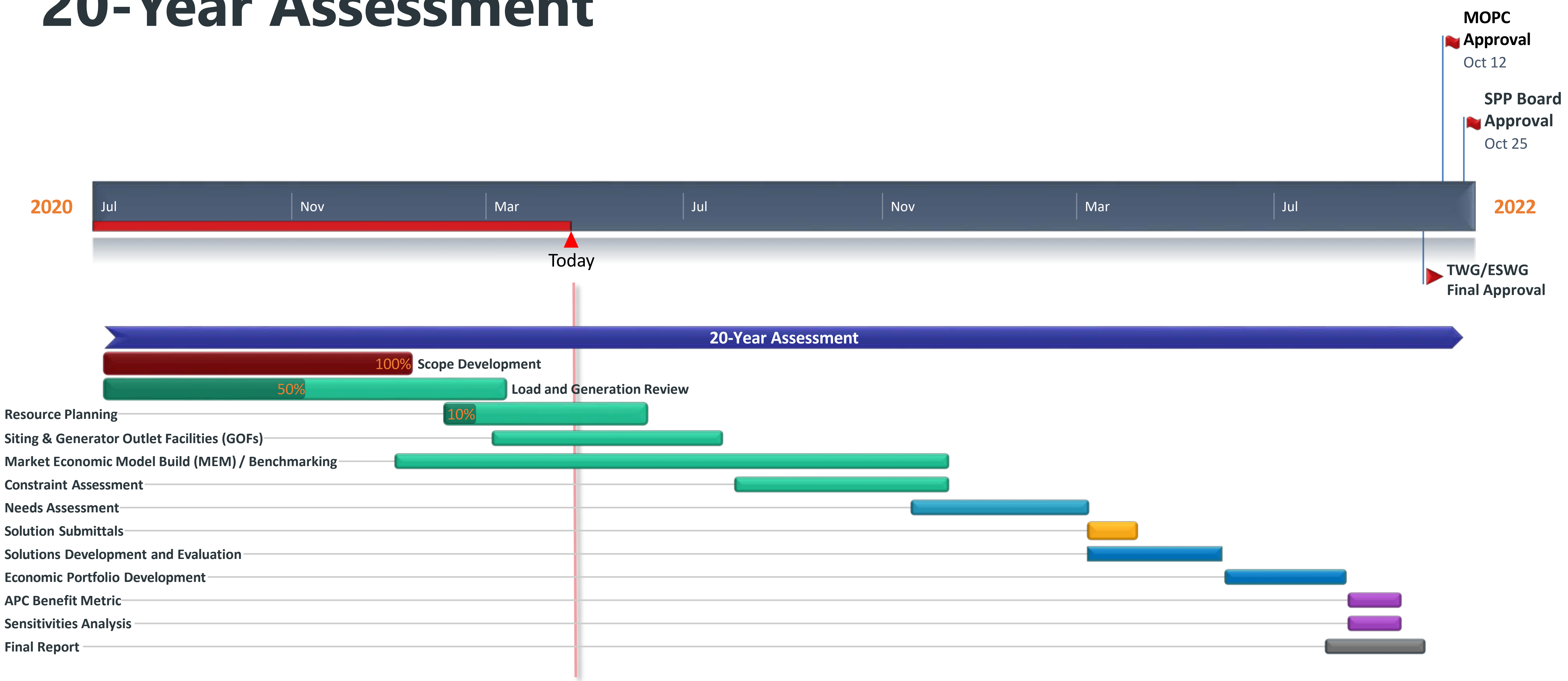
- Staff Leaders:
  - TWG – Adam Bell (abell@spp.org)
  - ESWG – Joshua Norton (jnorton@spp.org)

MOPC AND SPP BOARD

- MOPC: 10/12-13/2022
- SPP Board: 10/25/2022

20-YEAR ASSESSMENT

20-Year Assessment



LOAD REVIEW

- Start: 2/26/2021
- End: 5/6/2021 (Member's Final Approval)
- Member Review Time:
  - *Scope Methodology: (Posting: 3/24/2021) 3/25/2021 – 3/30/2021 (5 days)*
  - Future 1 & Future 2: (Posting: 4/1/2021)
  - Future 3 & Future 4: (Posting: 4/28/2021) 4/28/2021 – 5/4/2021 (5days)
  - **Final ESWG Approval: 5/5/2021**
- Staff Leader: Brooke Keene (bkeene@spp.org)
- Working Group Approval: ESWG

GENERATION REVIEW

- Start: 2/26/2021
- End: 5/6/2021 (Member's Final Approval)
- Member Review Time:
  - *Future 3 & Future 4: (Posting: 4/1/2021)*
  - Final Posting for Approval: (4/28/2021)
  - Final Stakeholder Review: 4/28/2021– 5/4/2021 (5 days)
  - **Final ESWG Approval: 5/6/2021**
- Staff Leader: Brooke Keene (bkeene@spp.org)
- Working Group Approval: ESWG

RENEWABLE POLICY REVIEW

- Start: 4/28/2021
- End: 6/10/2021 (Members' Final Approval)

- Staff Leader: Krishada Watson (kwatson@spp.org)
- Working Group Approval: ESWG

RESOURCE PLAN – PHASE 1

- Start: 4/28/2021
- End: 6/16/2021 (Members' Final Approval)

- Staff Leader: Krishada Watson (kwatson@spp.org)
- Working Group Approval: ESWG

RESOURCE PLAN – PHASE 2

- Start: 4/29/2021
- End: 6/23/2021 (Members' Final Approval)

- Staff Leader: Antonio Barber (abarber@spp.org)
- Working Group Approval: ESWG

CONTACT INFO

Dara Solomon, SPP Staff

dsolomon@spp.org

SPP Southwest Power Pool

2022 **ITP**

SITING PLAN

JOSHUA NORTON

HIGH-LEVEL SCHEDULE

May

- Stakeholder review of repository and baseline sites
- Preliminary Renewable Siting Plan review and exceptions window
- Distributed Solar Plan review and feedback

June

- Renewable siting plan + exceptions (ESWG review and approval)

June-July

- Battery siting plan + exceptions (ESWG review and approval)
- Conventional siting plan + exceptions (ESWG review and approval)
- External siting plan (ESWG review and approval)

DISTRIBUTED SOLAR

- Top 10% load buses per demand group
- Scoped amounts added on pro rata basis
- Include stakeholder feedback from previous ITP cycles
- Stakeholder review window in May

EXCEPTIONS TO INITIAL SITING PLANS

- SPP to post preliminary look at siting plans
  - Stakeholders to confirm sites of interest selected for siting
  - Stakeholders to present sites not selected for siting as exceptions
  - Initial siting plan list will not ensure inclusion
  - Any capacity approved as an exception by ESWG removed from lowest ranked sites
- Stakeholder materials on requested exceptions must include:
  - Generation interconnection status
  - PPA, firm service, or utility ownership information
  - Status of necessary regulatory filings and/or approvals
  - Procurement of financing
  - PTC safe harbor eligibility
  - Additional supporting information (public announcements, etc.)
- Template to be sent with exception solicitation

REFERENCE DOCUMENTS

- [Resource Siting Whitepaper]
- [Resource Siting Manual]