**SOUTHWEST POWER POOL**
ECONOMIC STUDIES WORKING GROUP MEETING

November 6-7, 2019
AEP Offices – Dallas, TX

# SUMMARY OF MOTIONS AND ACTION ITEMS

2020 ITP Items:

1. Approved staff recommendation that the ESWG approve the 2020 ITP Market Economic Model for use in the 2020 ITP Constraint Assessment as posted per the transmittal. An email vote was solicited:

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

2021 ITP Items:

1. Approved implementing updates to the **renewable policy requirements** as shown below (changes in **bold**)for the 2021 ITP, contingent on CAWG concurrence

RPS in ITP Manual

| State | RPS Type | Generation Type | Capacity- or Energy- Based | Year 5 % | Year 10 % |
|---|---|---|---|---|---|
| Kansas | Goal | Both | Capacity | 20 | 20 |
| Minnesota | Mandate | Both | Energy | 20 | 25 |
| Missouri | Mandate | Both | Energy | 15 | 15 |
| Montana | Mandate | Both | Energy | 15 | 15 |
| North Dakota | Goal | Both | Energy | 10 | 10 |
| New Mexico | Mandate | Wind | Energy | 15 | 15 |
| New Mexico | Mandate | Solar | Energy | 4 | 4 |
| South Dakota | Goal | Both | Energy | 10 | 10 |
| Texas | Mandate | Both | Capacity | 5 | 5 |

RPS Updates for 2021 ITP

| State | RPS Type | Generation Type | Capacity- or Energy- Based | Year 5 % | Year 10 % |
|---|---|---|---|---|---|
| Kansas | Goal | Both | Capacity | 20 | 20 |
| Minnesota | Mandate | Both | Energy | **25** | 25 |
| Missouri | Mandate | Both | Energy | 15 | 15 |
| Montana | Mandate | Both | Energy | 15 | 15 |
| North Dakota | Goal | Both | Energy | 10 | 10 |
| New Mexico | Mandate | **Both** | Energy | **40** | **50** |
| South Dakota | Goal | Both | Energy | 10 | 10 |
| Texas | Mandate | Both | Capacity | 5 | 5 |

2. Approved a motion to create a revision request to the ITP manual to remove the renewable policy requirements table from the manual and write language to point to a reference document
3. Approved a motion to use an average of two data sources for **Natural gas price forecasts**, the Vendor data set and Wood Mackenzie
4. Approved a motion to request a waiver from the ITP manual, which requires the use of resource expansion software, for the 2021 **Resource Plan**

5. Approved using the EIA AEO 2019 Advanced CC and Conventional CC prototypes for the 2021 **Resource Plan**
6. Approved the natural gas and demand **sensitivities** be performed for the 2021 ITP assessment using the methodologies laid out in the current ITP Manual. Approved additional **sensitivities** to proxy the previously recommended third future assumptions individually and comprehensively.

**SOUTHWEST POWER POOL**
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# 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
Jon Iverson, OPPD
John Olsen, Westar
Kurt Stradley, LES
Michael Watt, OMPA
Randy Collier, CUS
Tim Owens, NPPD
Zac Hager, OGE

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

Amber Greb (SPP) confirmed there was a quorum and provided the antitrust statement. Alan Myers reviewed the agenda for any changes, and it was noted that the 2021 Scope Renewable Accreditation item did not need approval. (Attachment 3 – Agenda)

> **Anita Sharma made a motion, seconded by Zac Hager, to approve the agenda. The motion was approved unanimously.**

## AGENDA ITEM 2 – REVIEW OF PAST ACTION ITEMS

Amber Greb reviewed past action items. (Attachment 4 – Past Action Items)

## AGENDA ITEM 3 – MOPC/BOARD RECAP

Alan Myers recapped presentations from the MOPC and Board meetings.

## AGENDA ITEM 4 – 2020 ITP ASSESSMENT

## AGENDA ITEM 4A – SCHEDULE

Sherri Maxey (SPP) reviewed the schedule for the 2020 ITP Assessment. It was discussed that having a DPP window date nailed down is important and needed very soon. (Attachment 5 – 2020 ITP Schedule)

## AGENDA ITEM 4B – POWERFLOW MODEL UPDATE

David Duhart (SPP) gave an overview of the Powerflow model build.

## AGENDA ITEM 4C – MARKET POWERFLOW MODEL UPDATE

Michael Odom (SPP) gave an overview of the market Powerflow model build and reviewed the next steps. (Attachment 6 – 2020 ITP Market Powerflow Build)

## AGENDA ITEM 5 – ACTION ITEM 199: SITING PLAN

Joshua Norton (SPP) led a discussion on the ESWG action item for the siting plan. He reviewed an assessment of the 2019 ITP siting plan and summarized findings in the siting whitepaper. He finished with ideas on options to move forward on the action item. (Attachment 7 – Action Item 199 – Siting Plan)

## AGENDA ITEM 6 – 2021 ITP ASSESSMENT

## AGENDA ITEM 6A – SCHEDULE

Sherri Maxey reviewed the schedule for the 2021 ITP Assessment. (Attachment 8 – 2021 ITP Schedule)

## AGENDA ITEM 6B – RENEWABLE POLICY REQUIREMENTS

Joshua Norton recommended updates to the renewable policy standards presented on slide 4 for the 2021 ITP. (Attachment 9 – Renewable Policy Requirements)

**Tim Owens made a motion, seconded by Kurt Stradley, to approve the update to the renewable policy standards. The motion was approved unanimously.**

## AGENDA ITEM 6C – SCOPE

## AGENDA ITEM 6CI – ACTION ITEM 197: FUEL FORECASTS

Ahmed Al Azzawi (SPP) discussed fuel price data sources, showed comparisons and presented options. He recommended using an average of vendor data set and Wood Mackenzie for natural gas price data. (Attachment 10 – AI 197 – Fuel Price Forecast)

**Anita Sharma made a motion, seconded by Jim Flucke, to approve the recommended methodology for natural gas prices. The motion was approved with one abstention: Zac Hager.**

Staff was directed to initiate a revision request to the ITP Manual.

## AGENDA ITEM 6CII – PROTOTYPES

Kirk Hall (SPP) presented staff's recommendation of a waiver of the ITP manual for the 2021 ITP requiring the use of resource expansion software. (Attachment 11 – Prototypes and RP2)

**Zac Hager made a motion, seconded by Kurt Stradley, to approve a waiver of the ITP manual for the 2021 ITP requiring the use of resource expansion software. The motion was approved with one abstention: Ben Elsey.**

Kirk Hall presented the prototypes and displayed the price curves for each. He made a recommendation on prototypes. (Attachment 11 – Prototypes and RP2)

**Zac Hager made a motion, seconded by Anita Sharma, to approve the EIA AEO 2019 Advanced CT for the 2021 ITP prototype and the EIA AEO 2019 Conventional CC prototype in the event of an exception requested for CC resource. The motion was approved unanimously.**

## AGENDA ITEM 6CIII – CONSOLIDATION

Amber Greb (SPP) reviewed previous consolidation methodologies and led a discussion on the direction for the 2021 Consolidation. (Attachment 12 – 2021 ITP Portfolio Consolidation-Scope)

## AGENDA ITEM 6CIV – SENSITIVITIES

James Bailey (SPP) presented additional sensitivities and made a recommendation. (Attachment 13 – 2021 ITP Scope Sensitivities)

**Tim Owens made a motion, seconded by Kurt Stradley, to approve the recommendation that natural gas and demand sensitivities be performed for the 2021 ITP assessment using the methodologies laid out in the current ITP Manual and that sensitivities be performed for the 2021 ITP to proxy the previously recommended third future assumptions individually and comprehensively. The motion was approved unanimously.**

## AGENDA ITEM 6CV – ACCREDITATION

Chris Jamieson (SPP) brought discussion on changes to wind, solar, and battery accreditation. There was concern raised about the current number of CTs being placed in the models.

## AGENDA ITEM 6D – LOAD & GENERATION REVIEW

Liz Gephardt (SPP) gave guidelines for stakeholder review of workbooks, and presented waiver and RAR application results. (Attachment 14 – 2021 ITP Load and Generation Review Update)

## AGENDA ITEM 7 – HITT ACTION ITEM: EVALUATE B/C RATIO FOR ECONOMIC PROJECTS

Amber Greb presented on the HITT recommendation to evaluate B/C ratio for economic projects. She reviewed a comparison of 40-year and 20-year B/C ratios for 2019 ITP projects and presented next steps and a schedule overview. (Attachment 15 – HITT Recommendation)

## AGENDA ITEM 8 – SOFTWARE TOOL EVALUATION UPDATE

Juliano Freitas (SPP) gave an update on the software retreat and discussed vendor's concerns about an open phone line.

## AGENDA ITEM 9 – ACTION ITEM 201: INTERCHANGE METHODOLOGY

Chris Jamieson reviewed relevant ITP Manual and Benefit Manual language for interchange methodology, stakeholder and staff observations, discussed a scope addition recommendation and next steps. (Attachment 16 – AI 201 – Review the Interchange Methodology)

## AGENDA ITEM 10 – ACTION ITEM 202 EVALUATE WIND TURBINE HEIGHT

James Bailey presented methodologies for addressing the action item and discussed next steps. (Attachment 17 – AI 202 – Evaluate Wind Turbine Height)

## AGENDA ITEM 11 – MOPC ACTION ITEM: BAKKEN LOAD ISSUE

Liz Gephardt informed the group of the issues with the Bakken load pocket and discussed options for incorporation into the 2021 ITP. (Attachment 18 – MOPC Action Item: Bakken Load)

# ECONOMIC STUDIES WORKING GROUP MINUTES
November 6-7, 2019

## AGENDA ITEM 12 – CLOSING ITEMS

There were no action items taken.

Respectfully Submitted,

Amber Greb

Secretary

| Name | Company/Email | Attendance |
|---|---|---|
| Aaron Shipley | ashipley@spp.org | Webex |
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| Jay Rasmussen | jay.rasmussen@duke-energy.com | Webex |
| Jeremy Severson | jseverson@bepc.com | Webex |

| | | |
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| Kirk Hall | khall@spp.org | Webex |
| Kurt Stradley | LES | In-person |
| Kyle McKinney | GSEC | In-person |
| Laura Cummings | Energy Exemplar | In-person |
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| Steve Hohman | shohman@oppd.com | Webex |
| Tim Owens | NPPD | In-person |
| Tracy Sykes | contractor-tsykes@spp.org | Webex |
| Warren | wwhitson@southernco.com | Webex |
| Zac Hager | OGE | In-person |
| Zachary Quintero | zachary.quintero@occ.ok.gov | Webex |

| Member | Proxy | Note |
|---|---|---|
| Bennie Weeks | Ben Elsey | |
| Jeremy Severson | Phil Westby | |
| John Olsen | Jim Flucke/Grant Wilkerson | |

SPP Southwest Power Pool

**SOUTHWEST POWER POOL, INC.**
**ECONOMIC STUDIES WORKING GROUP MEETING**

**November 6th-7th, 2019**
**AEP Offices – Dallas, TX**

# AGENDA

Wednesday, 1:00p.m. – 5:00p.m.
Thursday, 8:00a.m – 3:00p.m.

1. Administrative Items ..... Alan Myers (15 minutes) 1:00
   - A. Call to Order, Introductions ..... Alan Myers
   - B. Receipt of Proxies ..... Amber Greb
   - C. Review of Agenda[1] ..... Alan Myers
   - D. Antitrust Reminder ..... Amber Greb
2. Review of Past Action Items ..... Amber Greb (10 minutes) 1:15
3. MOPC/Board Recap ..... Alan Myers (10 minutes) 1:25
4. 2020 ITP Assessment ..... (45 minutes) 1:35
   - A. Schedule[1] ..... Sherri Maxey (10 minutes)
   - B. Powerflow Model Update ..... David Duhart (15 Minutes)
   - C. Market Powerflow Model Update[1] ..... Michael Odom (20 minutes)
5. Action Item 199: Siting plan[1] ..... Joshua Norton (45 minutes) 2:20
6. 2021 ITP Assessment ..... (205 minutes) 3:00
   - A. Schedule[1] ..... Sherri Maxey (10 minutes)
   - B. Renewable Policy Requirements[1] (Approval Item) ..... Joshua Norton (20 minutes) 3:10
   - C. Scope ..... (165 minutes) 3:30
     - i) Action Item 197: Fuel Forecasts[1] (Approval Item) ..... Ahmed Alazzawi (45 minutes)

[1] Background Material Included

ii) Prototypes[1] (Approval Item) ..... Kirk Hall (30 minutes) 4:15

iii) Consolidation[1] ..... Amber Greb (30 minutes) 4:45

iv) Sensitivities[1] (Approval Item) ..... James Bailey (30 minutes) 8:10

v) Accreditation ..... Chris Jamieson (30 minutes) 8:40

D. Load & Generation Review[1] ..... Liz Gephardt (10 minutes) 9:10

7. HITT Action Item: Evaluate B/C ratio for Economic Projects[1] ..... Amber Greb (60 minutes) 9:20

8. Software tool evaluation Update ..... Juliano Freitas (20 minutes) 10:20

9. Action Item 201: Interchange Methodology[1] ..... Chris Jamieson (45 minutes) 10:40

10. Action Item 202 Evaluate Wind Turbine height[1] ..... James Bailey (30 minutes) 11:30

11. MOPC Action Item: Bakken Load Issue ..... Liz Gephardt (20 minutes) 12:30

12. Closing Items ..... All (10 minutes) 12:50

A. Summary of Action Items (Amber Greb)

B. November Meeting Agenda Items

C. Future Meetings

i) November 18-19, 2019: Software Tool Evaluation Retreat

ii) December 11-12, 2019: 41st floor AEP Office, Dallas Texas

iii) January 8-9, 2020: 41st floor AEP Office, Dallas Texas

iv) February 5-6, 2020: 41st floor AEP Office, Dallas Texas

v) March 5-6, 2020: 41st floor AEP Office, Dallas Texas

**Southwest Power Pool, Inc.**

**ECONOMIC STUDIES WORKING GROUP**

**Pending Action Items Status Report**

**November 5-6, 2019**

| | Action Item | Date Originated | Status | Comments |
|---|---|---|---|---|
| 151 | SPP staff to look into optional software tools for use in ITP studies. | May 20th, 2015 | In Progress SPP Staff | Vendor Reports are due September 27th. The 2-day retreat will be November 18-19th. |
| 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 |
| 190 | SPP staff to perform a full transmission outage analysis before the next RCAR | October 12th, 2017 | SPP Staff | |
| 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 | Staff presented an education session in February, bring additional information as available |
| 197 | Research data sources for Fuel Prices and determine methodology for averaging/removing bias | March 13, 2019 | SPP Staff | Staff will bring a recommendation during 2021 Scope development |
| 198 | Research the appropriateness of the 2.5% inflation rate used in ITP Assessments | April 11, 2019 | SPP Staff | Goal: to complete and implement for the 2021 ITP Assessment |
| 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 |
| 200 | Address the Load shape issues provided by ABB | July 2019 | SPP Staff | |
| 201 | Review the interchange methodology | July 2019 | SPP Staff | Goal: To complete for the 2021 ITP Assessment |
| 202 | Re-Evaluate the existing wind 80/100 meter turbine height | July 2019 | SPP Staff | Goal: 2021 ITP Scope |
| 203 | Conduct a Lessons Learned Session with the ESWG on the 2019 ITP Assessment | August 2019 | SPP Staff | |

| | | | | |
|---|---|---|---|---|
| 204 | Discuss the 2020 ITP consolidation methodology and if changes are needed in the scope. | September | All | |
| 205 | MOPC Action Item: TWG, and ESWG to recommend best way to incorporate Basin's concerns about winter peaking Bakken area load and generation supply issues in the 2021 ITP. | MOPC October 15-16, 2019 | In Progress | |
| 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 | |

SPP Southwest Power Pool

2020 ITP

# 2020 ITP SCHEDULE

SHERRI MAXEY

NOVEMBER 6, 2019

# POWERFLOW MODEL

- Start: 7/09/2018
- End: 2/22/2019 (Final Approval)
- Member Review Time:
  - *Pass 0 – Trial 1: 7/13/2018 – 7/20/2018 (5 days)*
  - *Pass 0 – Trial 2: 8/03/2018 – 8/24/2018 (15 days)*
  - *Pass 1: 9/14/2018 – 9/21/2018 (5 days)*
  - *Pass 2: 10/05/2018 – 10/26/2018 (15 days)*
  - *Pass 3: 11/16/2018 – 12/07/2018 (15 days)*
  - *Pass 4: 12/21/2018 – 1/11/2019 (15 days)*
  - *Final Data Submission Deadline: 1/11/2019*
  - *Final Initial ITP: 2/11/2019 – 2/15/2019 (5 days)*
  - *Final Initial ITP Approval: 2/22/2019*
  - Final TWG Approval after Oct. 2019 Board approved projects:
    - Posting: 11/1/2019; Stakeholder Review: 11/04/2019 – 11/08/2019
- Staff Leader: David Duhart (dduhart@spp.org)
- Working Group Approval: TWG

# SHORT CIRCUIT MODEL

- Start: 11/14/2018
- Initial End: 2/28/2019
- Final End: 11/08/2019
- Member Review Time:
  - *Pass 1: 12/14/2018 – 1/11/2018 (6 days)*
  - *Pass 2: 2/08/2019 – 2/15/2019 (6 days)*
  - *Pass 3: 2/21/2019 – 2/28/2019 (6 days) (MDWG Approval) Complete*
  - Final TWG Approval after Oct. 2019 Board approved projects:
    - Posting: 11/1/2019; Stakeholder Review: 11/04/2019 – 11/08/2019
- Staff Leader: Michael Odom (modom@spp.org)
- Working Group Approval: TWG

# MARKET ECONOMIC MODEL BUILD

- Start: 2/01/2019
- End: 12/31/2019 (Member's Final Approval)
- Member Review Time:
  - *Post 1: 6/13/2019 – 6/28/2019 (12 days)*
  - *Post 2: 9/30/2019 – 10/07/2019 (5 days)*
  - *Post 3: Post for Approval (Constraint Assessment): 10/22/2019 – 10/29/2019 (5 days)*
  - ESWG Member Approval for use in Constraint Assessment via email on 10/30/19
  - Final Posting for ESWG Member Approval via email: 12/20/2019 – 12/31/2019
  - Final ESWG Approval email vote ending: 12/31/2019
- Staff Leader: Kelsey Allen (kallen@spp.org)
- Working Group Approval: ESWG

# CONSTRAINT ASSESSMENT

- Start: 10/22/2019
- End:  12/31/2019
- Member Review Time:
  - Post for Stakeholder Review:  12/10/2019 – 12/17/2019 (5 days)
  - Final Posting for TWG Member Approval via email: 12/20/2019 – 12/31/2019
  - Final TWG Approval email vote ending: 12/31/2019
- Staff Leader: Kirk Hall (khall@spp.org)
- Working Group Approval: TWG

# MARKET POWERFLOW MODELS (BA RELIABILITY)

- Start: 10/18/2019
- End: 1/22/2020 (Member's Final Approval)
  - Pass 1 (Reactive System Adjustments): 12/26/2019 – 1/02/2020 (5 days)
  - Pass 2: 12/31/2020 – 1/07/2020 (5 days)
  - Final: 1/9/2020 – 1/15/2020 (5 days)
  - Final TWG Approval email vote ending: 1/22/2020

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

# BASE RELIABILITY NEEDS ASSESSMENT

- Start: 10/18/2019
- End: 3/12/2020

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

# MARKET POWERFLOW RELIABILITY NEEDS ASSESSMENT

- Start: 1/22/2020
- End: 3/12/2020

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

# ECONOMIC NEEDS ASSESSMENT

- Start: 12/20/2020
- End: 3/12/2020

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

# PUBLIC POLICY NEEDS ASSESSMENT

- Start: 12/20/2019
- End: 3/12/2020

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

# OPERATIONAL NEEDS ASSESSMENT

- Start: 1/02/2020
- End: 3/12/2020

- Staff Leader: Will Tootle (wtootle@spp.org)

# SHORT CIRCUIT NEEDS ASSESSMENT

- Start: 11/01/2020
- End: 3/12/2020

- Staff Leader: Jason Terhune (jterhune@spp.org)

# DPP WINDOW

- Start: 3/13/2020 12:00 a.m.
- End: 4/11/2020 11:59 p.m.
- Member Review Time:
  - Transmission-planning response window (30 calendar days)
- Staff Leader: Tammy Bright (tbright@spp.org)

# SOLUTIONS DEVELOPMENT & VALIDATION

- Start: 3/16/2020
- End: 6/05/2020

- Staff Leaders:
  - Reliability: Kelsey Allen (kallen@spp.org)
  - Economic/Policy: Liz Gephardt(lgephardt@spp.org)
  - Operational: Will Tootle (wtootle@spp.org)
  - Short Circuit: Jason Terhune (jterhune@spp.org)

# SOLUTIONS EVALUATION

- Start: 3/16/2020
- End: 6/10/2020

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

# RELIABILITY PORTFOLIO DEVELOPMENT

- Start: 3/16/2020
- End: 7/31/2020

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

# ECONOMIC PORTFOLIO DEVELOPMENT (INCLUDES PROJECT GROUPING)

- Start: 3/16/2020
- End: 7/31/2020

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

# STUDY COST ESTIMATES – ROUND 1

- Start: 6/08/2020
- End: 6/19/2020

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

# PLANNING SUMMIT

- Start: 6/22/2020
- End: 7/03/2020
- Member Review Time:
  - Summit Materials (7 days prior to meeting) – Date TBD
- Staff Leader: Tammy Bright (tbright@spp.org)

# STUDY COST ESTIMATES – ROUND 2

- Start: 7/06/2020
- End: 7/18/2020

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

# FINALIZE RELIABILITY PORTFOLIOS

- Start: 7/31/2020
- End: 8/07/2020

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

# OPTIMIZATION & PORTFOLIO CONSOLIDATION

- Start: 7/31/2020
- End: 8/14/2020

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

# PROJECT STAGING

- Start: 8/17/2020
- End: 8/31/2020

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

# BENEFIT METRICS CALCULATION

- Start: 8/17/2020
- End: 9/11/2020

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

# STABILITY ANALYSIS

- Start: 8/17/2020
- End: 9/11/2020

- Staff Leader: Dee Edmondson (dedmondson@spp.org)

# SENSITIVITY ANALYSIS

- Start: 8/17/2020
- End: 9/11/2020

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

# FINAL RELIABILITY ASSESSMENT

- Start: 8/17/2020
- End: 9/11/2020

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

# RATE IMPACTS/ATRR

- Start: 8/31/2020
- End: 9/18/2020

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

# FINAL REPORT

- Start: 8/1/2020
- End: 9/18/2020
  - Final ESWG/TWG Approval in Sept. 2020
- Staff Leader: Tammy Bright (tbright@spp.org)

# TWG/ESWG FINAL APPROVALS

- Start: 9/18/2020
- End: 10/2/2020

- Staff Leaders:
  - TWG – Dee Edmondson (dedmondson@spp.org)
  - ESWG – Amber Greb (agreb@spp.org)

# MOPC AND SPP BOARD

- Start: 9/14/2020
- End: 10/27/2020

- Member Review Time:
  - MOPC:  10/2/2020 – 10/13/2020 (7 days)
  - SPP Board:  10/20/2020 – 10/27/2020 (5 days)

# 2020 ITP MARKET POWERFLOW MODEL (MPM)

MICHAEL ODOM

# BACKGROUND

- ITP Manual and ITP Scope contain governing language for the 2020 ITP Market Powerflow Model build
- MP models are assessed in the Deliverability, ITP, and TPL assessments
  - Year 1 for Deliverability Study
  - Year 2, 5, 10 for ITP
  - Year 2, 5 for TPL Sensitivity
- There are 11 MPM models planned to be built
  - Year 1, F1 On-Peak
  - Year 2, F1 On-Peak & Off-Peak
  - Year 5, F1 & F2 On-Peak & Off-Peak
  - Year 10, F1 & F2 On-Peak & Off-Peak

# GOVERNING LANGUAGE

- ITP Manual and ITP Scope contain governing language for the 2020 ITP Market Powerflow Model build
- MP On-Peak represents the Summer On-Peak hour (Coincident to SPP) from the PROMOD 8760 simulation
- MP Off-Peak represents the Off-Peak hour (Between April and May) from the PROMOD 8760 simulation
- Generation is SCUC / SCED to match PROMOD, accounts for approximated losses
- Load is based on PROMOD demand groups, power factor from Base Reliability models
- Interchange is based on PROMOD
- Reactive Device Settings changes can be made via member request
- External data sourced from Base Reliability model or MTEP

# MARKET POWERFLOW MODEL BUILD OVERVIEW

- Acquire PROMOD simulations
- Utilize PAT to export Operating Point data
- Incorporate Operating Point data into PSSE
- Solve models
- Run Powerflow Docucheck to identify errors
- Coordinate with members to correct errors and to review reactive device settings
- Make model updates as needed
- Finalize models
- Request TWG approval of models

# NEXT STEPS

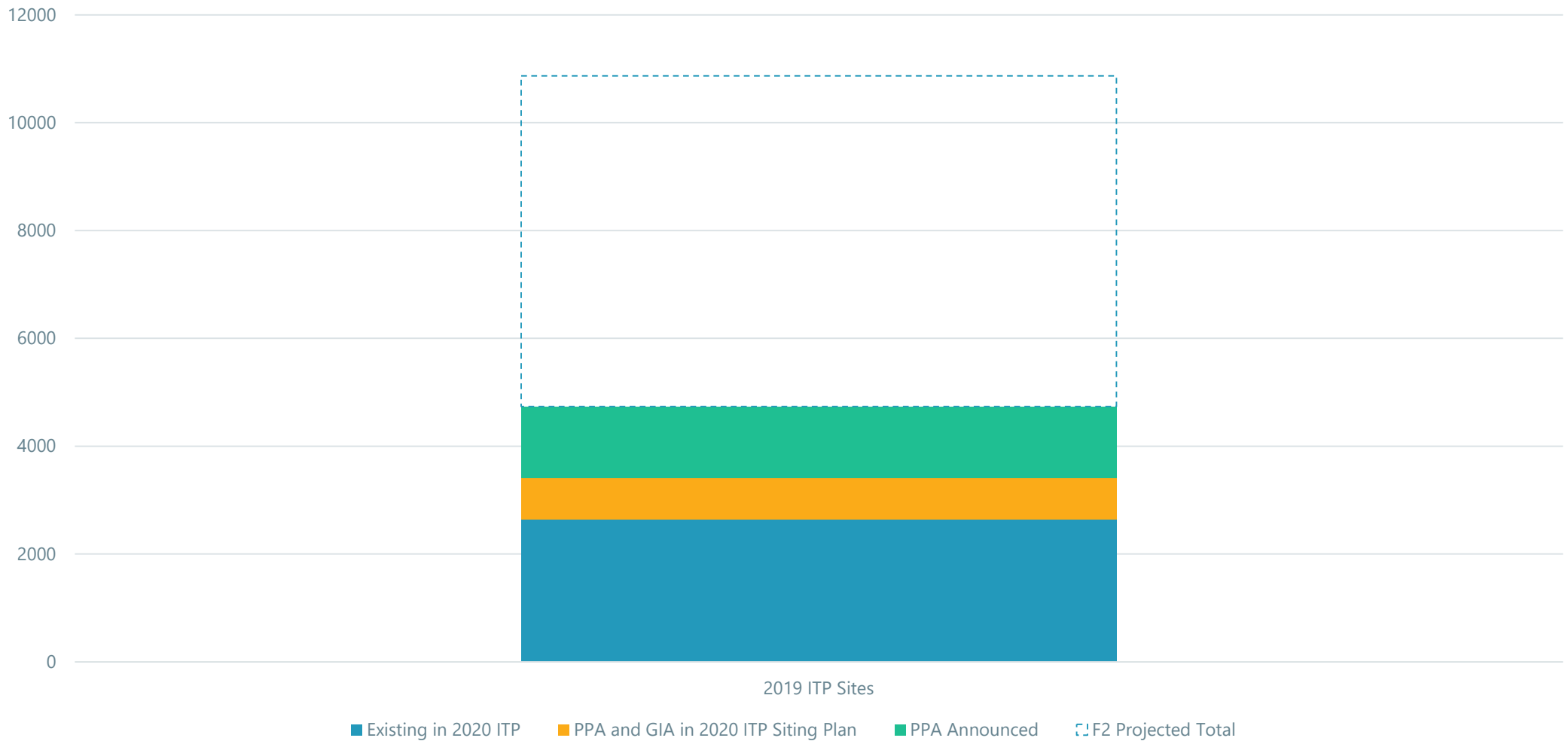
- Preliminary MPM build in progress
- After Constraint Assessment is finalized, incorporate updated PROMOD generation and load
- Finalize the Market Powerflow Models

# ACTION ITEM 199 – SITING PLAN

# ACTION ITEM BACKGROUND

- Review how we inform our Siting Plan
  - Research the appropriateness of relying on the GI Queue for siting of renewables and battery storage and look into other available information
- Goal to complete and implement for the 2021 ITP Assessment

# 2019 ITP SITING ASSESSMENT



# REVIEW OF SITING WHITE PAPER


https://www.spp.org/Documents/60787/ITP%20Resource%20Siting%20Process%20White%20Paper.docx

# NOTABLE FINDINGS RELATED TO ACTION ITEM


- Stakeholders were open to using GI queue for potential sites
- Stakeholders were concerned with solely leveraging the GI queue for renewables because the GI queue may not always represent renewable sites with the best capacity factors in SPP
- Stakeholders were open to using LMPs to inform siting
- Stakeholders value cost-effective transmission expansion that increases access to high potential solar and wind resources and the associated production cost savings

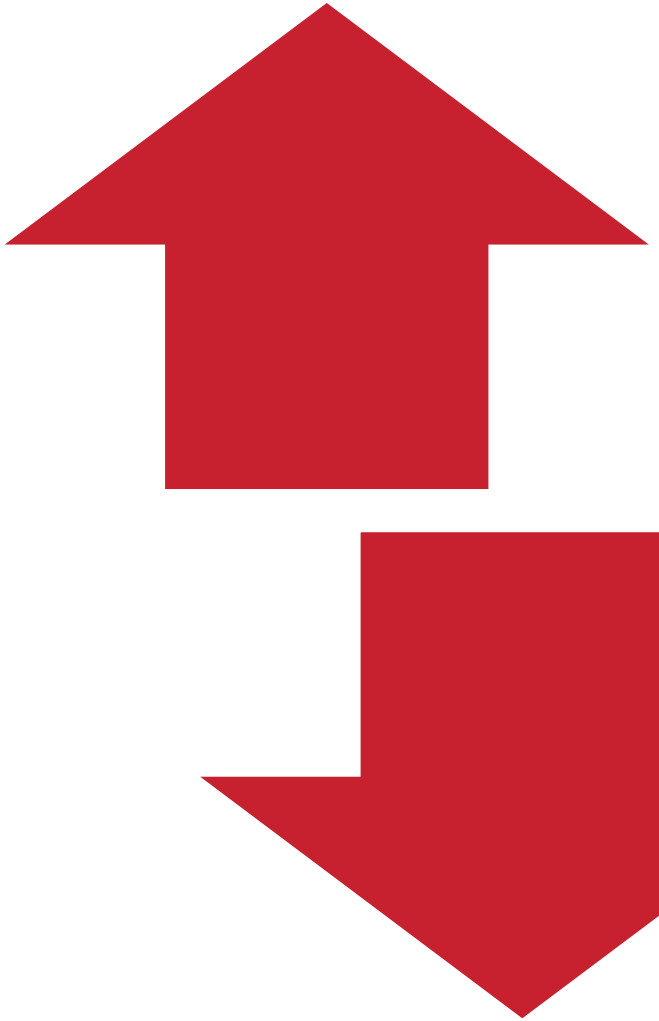
# OTHER RTO SITING PROCESS


- MISO, PJM, and ERCOT all utilize GI queue

# NOTABLE IMPROVEMENTS IDENTIFIED


1. Leverage the existing SPP GI queue to identify potential sites, especially for wind resources
2. Identify whether adequate interconnection transmission exists for a potential site
3. A repository of conceptual sites

# CHOOSING WIND SITES



LMPs

Capacity Factor

Wind Quality

Land Rights

Interconnection Costs

# IDEAS

- Site repository to be built up to include more high capacity factor sites
- Instead of Cost/MW ranking of GI Queue, use Cost/MWh
- No preference on site origination, use LMP and calculate a potential revenue per site for ranking
- Do not exclude suspended IAs and/or GIA commercial operation date past for siting consideration
- Use queue sites for year 5, others for year 10

# APPENDIX

# STANDARD SITE PRIORITIZATION

ESWG Approved
Included in Siting Manual

- Utility solar ranking
  - Within zone or state of operation
    - Site source preference:
      - Active GI queue requests
      - Stakeholder repository feedback
      - Previous ITP sites
      - Other NREL conceptual sites
  - Within each site source:
    - Capacity factor
      - If only lower than average SPP capacity factors available, site some portion in higher capacity factor area
    - Generator outlet capability based on FCITC and scope of GOF

# STANDARD SITE PRIORITIZATION

ESWG Approved
Included in Siting Manual

- Wind
  - GI queue requests
    - Cost/MW for transmission owner interconnection facilities and network upgrades
      - Includes consideration of potentially directly-assigned upgrades needed, unknown third-party system impacts, and scope of GOF
      - Currently suspended IAs and/or GIA commercial operation date past not considered for siting
    - If cost data not available
      - Use generator outlet capability based on FCITC and scope of GOF
      - Identify/relate recurring issues within GI groupings

# STANDARD SITE PRIORITIZATION

ESWG Approved
Included in Siting Manual

- Conventional
  - Within zone of majority ownership
    - Adjacent zone if limited site availability or generator outlet capability
    - Stakeholder repository feedback
      - Unless limited by generator outlet capability and/or scope of GOF
    - Preference to existing and assumed retirement sites then ITP sites
    - Generator outlet capability based on FCITC and scope of GOF
  - Limit conventional capacity to 1,500 MW at any site

# EXCEPTIONS

- 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.)

ESWG Approved
Included in Siting Manual

# MISO SITING PROCESS

# MTEP Wind Siting Tier Development

- Siting tiers are created based on combination of Vibrant Clean Energy (VCE) study results and MISO's Interconnection Queue data
- Capacity is sited in tiers based on priority
- Sites filled evenly within tier until total tier capacity filled

| Tier 1** | Tier 2 | Tier 3 | Tier 4 | Tier 5* | Tiers 6+ |
|---|---|---|---|---|---|
| Remaining MVP-enabled capacity in RGOS Zones | VCE Zones 30% / ***Phase 3 and Phase 2 Queue Sites*** | VCE Zones 30% / ***Phase 1 Queue Sites*** | VCE Zones 30% / ***Pre-Queue and Withdrawn Queue Sites*** | VCE Zones 50% | VCE Zones 90% |

*Existing Zones* *Planned/likely areas for wind expansion* *Potential areas for future wind expansion*

- *VCE results (location, MW) are used as an indication of potential wind growth zones*
- *MISO will continue to monitor developing trends; should there be a shift in concentrations of wind developments, MISO will adjust zones/tiers accordingly*

* "50% VCE" refers to results from the 50% penetration case
** Multi-Value Project (MVP)-Enabled capacity, see https://www.misoenergy.org/Planning/TransmissionExpansionPlanning/Pages/MVPAnalysis.aspx

# MTEP Utility-Scale Solar Siting Tier Development

- Siting tiers are created based on combination of Vibrant Clean Energy (VCE) study results and MISO's Interconnection Queue data
- Capacity is sited in tiers based on priority
- Sites filled evenly within tier until total tier capacity filled

| Tier 1 | Tier 2 | Tier 3 | Tier 4* | Tiers 5 |
|---|---|---|---|---|
| VCE Zones 30% / ***Phase 3 and Phase 2 Queue Sites*** | VCE Zones 30% / ***Phase 1 Queue Sites*** | VCE Zones 30% / ***Pre-Queue and Withdrawn Queue Sites*** | VCE Zones 50% | VCE Zones 90% |

- *VCE results (location, MW) are used as an indication of potential solar growth zones*
- *MISO will continue to monitor developing trends; should there be a shift in concentrations of wind developments, MISO will adjust zones/tiers accordingly*

## MISO will continue to update renewable zones in future MTEP cycles as needed based on new developments

- New developments include:
  - Queue activity
  - Emerging trends
  - Additional analysis
- In MTEP18 and MTEP19, wind sited in all LRZs in Distributed & Emerging Technologies future
- In each cycle, wind & solar siting tier priority is adjusted based on most recent Interconnection Queue data

SPP Southwest Power Pool

2021 ITP

# 2021 ITP SCHEDULE

SHERRI MAXEY

NOVEMBER 6, 2019

# SCOPE DEVELOPMENT

- Start: 7/08/2019
- End: 1/14/2020 (Member's Final Approval)
  - MOPC Approval: 1/14/2020
- Member Review Time:
  - 12/03/2019 – 12/11/2019 (8 days)
  - Approved by ESWG: 12/11/2019
  - 12/10/2019 – 12/18/2019 (8 days)
  - Approved by TWG: 12/18/2019
- Staff Leader: Amber Greb (agreb@spp.org)
- Working Group Approvals: ESWG and TWG

# POWERFLOW & SHORT CIRCUIT MODELS

- Start: 7/09/2019
- End: 3/06/2020 (Final Approval)
- Member Review Time:
  - *Pass 0 – Trial 1: 7/22/2019 – 7/26/2019 (5 days) (complete) – Powerflow only*
  - *Pass 0 – Trial 2: 8/12/2019 – 8/30/2019 (15 days) (complete) – Powerflow only*
  - *Pass 1 – Trial 1: 9/30/2019 – 10/18/2019 (15 days) (complete) – Powerflow only*
  - *Pass 1 – Trial 1: 10/4/2019 – 10/18/2019 (10 days) (complete) – Short Circuit*
  - Pass 1 – Trial 2: 11/18/2019 – 12/13/2019 (20 days)
  - Last Chance Data Submission Deadline: 12/13/2019*
  - Pass 2: 1/20/2020 – 2/07/2020 (15 days)
  - Final Chance Data Submission Deadline: 2/07/2020**
  - Final Initial ITP: 2/28/2020 – 3/06/2020 (5 days)
  - Final Initial ITP Approval: 3/06/2020
  - Final ITP Approval with Oct. 2020 Board approved projects 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

- Start: 7/19/2019
- End: 2/05/2020 (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: 1/29/2020
  - Final ESWG Approval: 2/05/2020
- Staff Leader: Liz Gephardt (lgephardt@spp.org)
- Working Group Approval: ESWG

# GENERATION REVIEW

- Start: 7/19/2019
- End: 2/05/2020 (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: 1/29/2020
  - Final ESWG Approval: 2/05/2020
- Staff Leader: Liz Gephardt (lgephardt@spp.org)
- Working Group Approval: ESWG

# RENEWABLE POLICY REVIEW

- Start: 1/07/2020
- End: 2/14/2020 (Member's Final Approval)
- Member Review Time:
  - 2/03/2020 – 2/10/2020 (5 days)

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

# POLICY RENEWABLE RESOURCE PLAN – PHASE 1

- Start: 2/03/2020
- End: 3/05/2020 (Member's Final Approval)
- Member Review Time:
  - 2/13/2020 – 2/21/2020 (6 days)

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

SPP Southwest Power Pool

2021 **ITP**

# RENEWABLE POLICY REQUIREMENTS

JOSHUA NORTON

# ITP MANUAL ALLOWS FOR ADJUSTMENTS

2.2.1.3 Renewable Policy Review

If any significant changes to renewable mandates or goals occur during an ITP assessment, SPP stakeholders can bring them to the ESWG for review and potential approval for use in the ITP assessment. If exemptions to the mandates or goals are allowed (e.g. the applicable technology is cost prohibitive or municipals are exempt), those exemptions will be considered as SPP is notified during the renewable policy review.

Any resulting deviations from the standard values in Table 3 will be noted in the study report.

# LEGISLATION REVIEW COMPLETED IN AUGUST

- Update needed for Minnesota
- New Mexico had significant legislation passed

# UPDATES TO RENEWABLE POLICY STANDARDS

## RPS in ITP Manual

| State | RPS Type | Generation Type | Capacity- or Energy- Based | Year 5 % | Year 10 % |
|---|---|---|---|---|---|
| Kansas | Goal | Both | Capacity | 20 | 20 |
| Minnesota | Mandate | Both | Energy | 20 | 25 |
| Missouri | Mandate | Both | Energy | 15 | 15 |
| Montana | Mandate | Both | Energy | 15 | 15 |
| North Dakota | Goal | Both | Energy | 10 | 10 |
| New Mexico | Mandate | Wind | Energy | 15 | 15 |
| New Mexico | Mandate | Solar | Energy | 4 | 4 |
| South Dakota | Goal | Both | Energy | 10 | 10 |
| Texas | Mandate | Both | Capacity | 5 | 5 |

## RPS Updates for 2021 ITP

| State | RPS Type | Generation Type | Capacity- or Energy- Based | Year 5 % | Year 10 % |
|---|---|---|---|---|---|
| Kansas | Goal | Both | Capacity | 20 | 20 |
| Minnesota | Mandate | Both | Energy | **25** | 25 |
| Missouri | Mandate | Both | Energy | 15 | 15 |
| Montana | Mandate | Both | Energy | 15 | 15 |
| North Dakota | Goal | Both | Energy | 10 | 10 |
| New Mexico | Mandate | **Both** | Energy | **40** | **50** |
| South Dakota | Goal | Both | Energy | 10 | 10 |
| Texas | Mandate | Both | Capacity | 5 | 5 |

# RECOMMENDATION

- SPP Staff recommends implementing the updates to the renewable policy requirement as presented on slide 4 for the 2021 ITP

# NEXT STEPS

- ITP Manual RR Options
  - Update table in ITP Manual
  - Update table and pull out as reference document

# MOTION

Create a revision request to the manual to remove the renewable policy requirements table and write language to point to a reference document

2021 **ITP**

# APPENDIX

# ITP MANUAL SECTION 2.2.1.3

2.2.1.3 Renewable Policy Review

After the forecasted load is finalized, renewable policy standards (RPS) will be assessed for utilities within the SPP footprint. The percentages in Table 3 will be used to calculate the mandate or goal for each utility residing in the listed states with respect to the load submitted as part of the SPP annual data request. 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.

The values in Table 3 consider forward-looking legislation set by the states that either should be or must be met, depending on the state, in each of the study years. A generation type of "both" indicates the mandate or goal can be met by either wind or solar generation in the study. Both capacity- and energy-based mandates and goals will be assessed for fulfillment during development of the resource plan. Those that are energy-based also will be assessed during the policy needs assessment. States within the SPP footprint that are not included in Table 3 do not have RPS requirement for the purposes of this renewable policy review.

Renewable energy credits will be accommodated appropriately as provided to SPP.

If any significant changes to renewable mandates or goals occur during an ITP assessment, SPP stakeholders can bring them to the ESWG for review and potential approval for use in the ITP assessment. If exemptions to the mandates or goals are allowed (e.g. the applicable technology is cost prohibitive or municipals are exempt), those exemptions will be considered as SPP is notified during the renewable policy review.

Any resulting deviations from the standard values in Table 3 will be noted in the study report.

# NEW MEXICO LEGISLATION

- In March 2019, the New Mexico Legislature enacted legislation to increase the state's renewable portfolio standard. 2019 N.M. Laws ch. 65 (S.B. 489) (effective June 14, 2019). The 2019 act increases the renewable energy requirement for all investor-owned utilities and rural electric cooperatives to 40% by 2025 and 50% by 2030. For investor-owned utilities, the act increases the renewable portfolio standard to 80% by 2040 and requires zero-carbon resources to supply 100% of all retail electricity sales by 2045 after considering safety, reliability, and costs to customers. For rural electric cooperatives, the act sets a target of 100% zero-carbon resources by 2050, composed of at least 80% renewable energy after considering safety, reliability, and costs to customers.

- Eligible renewable energy resources include: solar; wind; geothermal; hydropower operating on or after July 1, 2007 (earlier hydropower facilities available to rural electric cooperatives up to 2007 cap); certain biomass; fuel cells that do not use fossil fuels to create electricity; and landfill gas and anaerobically digested waste biogas. The definition of renewable energy resources applicable to rural electric cooperatives expressly excludes electric energy generated by use of fossil fuel or nuclear energy.

- The 2019 act clarifies that renewable energy may be matched with energy storage and still qualify as renewable. It also removes the requirement that renewable resources be diversified.

- The 2019 act limits carbon dioxide emissions to no more than 1,100 pounds per megawatt-hour on and after January 1, 2023, for a new or existing electric generating facility with an original installed capacity exceeding 300 megawatts and that uses coal as a fuel source.

- The 2019 act revises the general renewable energy exemption based on cost for both investor-owned utilities and rural electric cooperatives to $60.00 per megawatt-hour at the point of interconnection, adjusted for inflation after 2020.

- Enabling Statutes: N.M. Stat. Ann. §§ 62-16-1 to -10, 62-15-34 to -37, 74-2-5.

# MINNESOTA LEGISLATION

- **E. Minnesota** - 25% + 1.5% Solar by 2025 for Investor-Owned Utilities (Standard); 25% by 2025 for Other Utilities (Standard); 10% Solar by 2030 (Goal)
- Minnesota's renewable portfolio standard requires investor-owned utilities, generation and transmission electric cooperatives, municipal power agencies, and power districts operating in the state to have at least 25% of retail electricity sales be generated or procured using eligible renewable sources by 2025. The standard also sets intermediate targets, including 20% by 2020. Minnesota's nuclear utility, Xcel Energy, is required to meet a higher standard of 30% by 2020.
- Eligible renewable energy resources include: solar; wind; hydropower (capacity less than 100 megawatts); hydrogen generated by another eligible renewable energy; and biomass.
- For public utilities in the state, there is a requirement that an additional 1.5% of all retail sales come from solar energy by the end of 2020, with at least 10% of the 1.5% from solar facilities with a nameplate capacity of 40 kilowatts or less.
- In addition to the requirements of the renewable portfolio standard, Minnesota has set a statewide goal that 10% of all retail electricity sales be generated by solar energy by 2030.
- Enabling Statute: Minn. Stat. § 216B.1691.

# ACTION ITEM 197 – FUEL PRICE FORECAST

ESWG

OCTOBER 6-7, 2019

AHMED ALAZZAWI

# OVERVIEW

- ESWG Action Item 197: Research data sources for Fuel Prices and determine methodology for averaging/removing bias
- *Today's Goals*
  - Discuss hybrid fuel price options for incorporation into the 2021 ITP assessment
  - Select and approve fuel price methodology for the 2021 ITP
  - Discuss potential ITP Manual changes

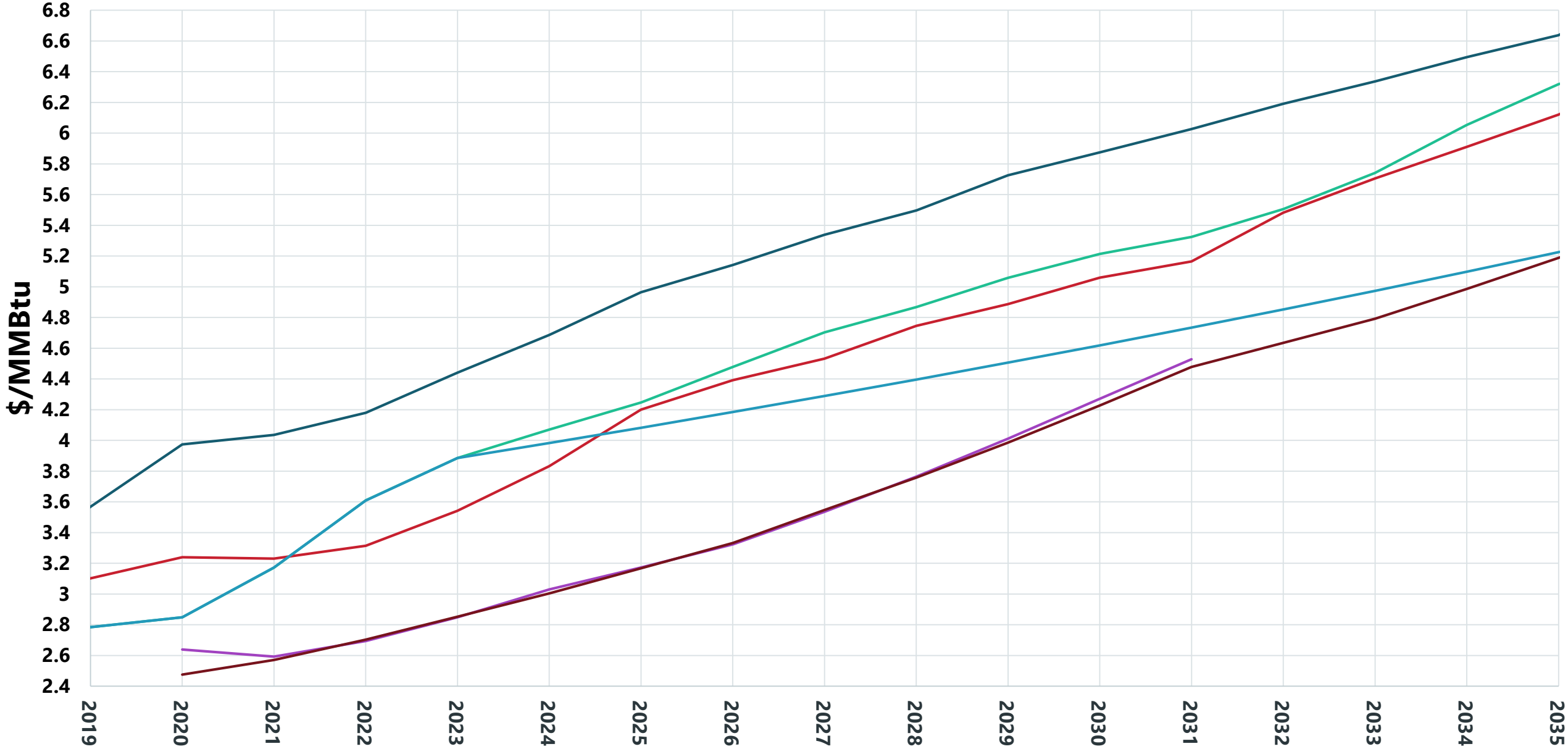
# DATA SOURCES REVIEWED

| | ABB | EIA–AEO | EIA–STEO | Wood Mackenzie | Platts | NYMEX | IHS | Anchor Power – Horizons Energy |
|---|---|---|---|---|---|---|---|---|
| Data range | 22+ | 30 years out | 1 year out | 20 years out | 20 years out | 11 years out | 30 years out | 30 years out |
| Cost | $6,000 | FREE | FREE | $5,400 | $2,000 | FREE | $25,000 | $2,500 |
| Data Granularity | Monthly | Yearly | Monthly | Monthly | Monthly | Monthly | Monthly | Monthly |
| Methodology | NYMEX Short term | NEMS | HH spot price | GPCM | ICE, EIA, GPCM | Traded value | GPCM, AURORA | AEO, EnCompass |
| Data update frequency | Semi-annually | Once a year | Monthly | Semi-annually | Monthly | Every 10 minutes | Semi-annually | Semi-annually |
| Data for comparison | √ | √ | √ | √ | √ | √ | – | – |
| Hybrid release restrictions | NDA | – | – | Hybrid is fine | Hybrid is fine | – | NDA | Hybrid is fine |

- MISO uses NYMEX gas prices for the first 2 years
- For later years MISO uses an average of EIA and IHS (previously MISO used a combination of EIA and Wood MacKenzie)

- Energy Exemplar uses:
- NYMEX, EIA STEO – Short term
- EIA AEO – Long term

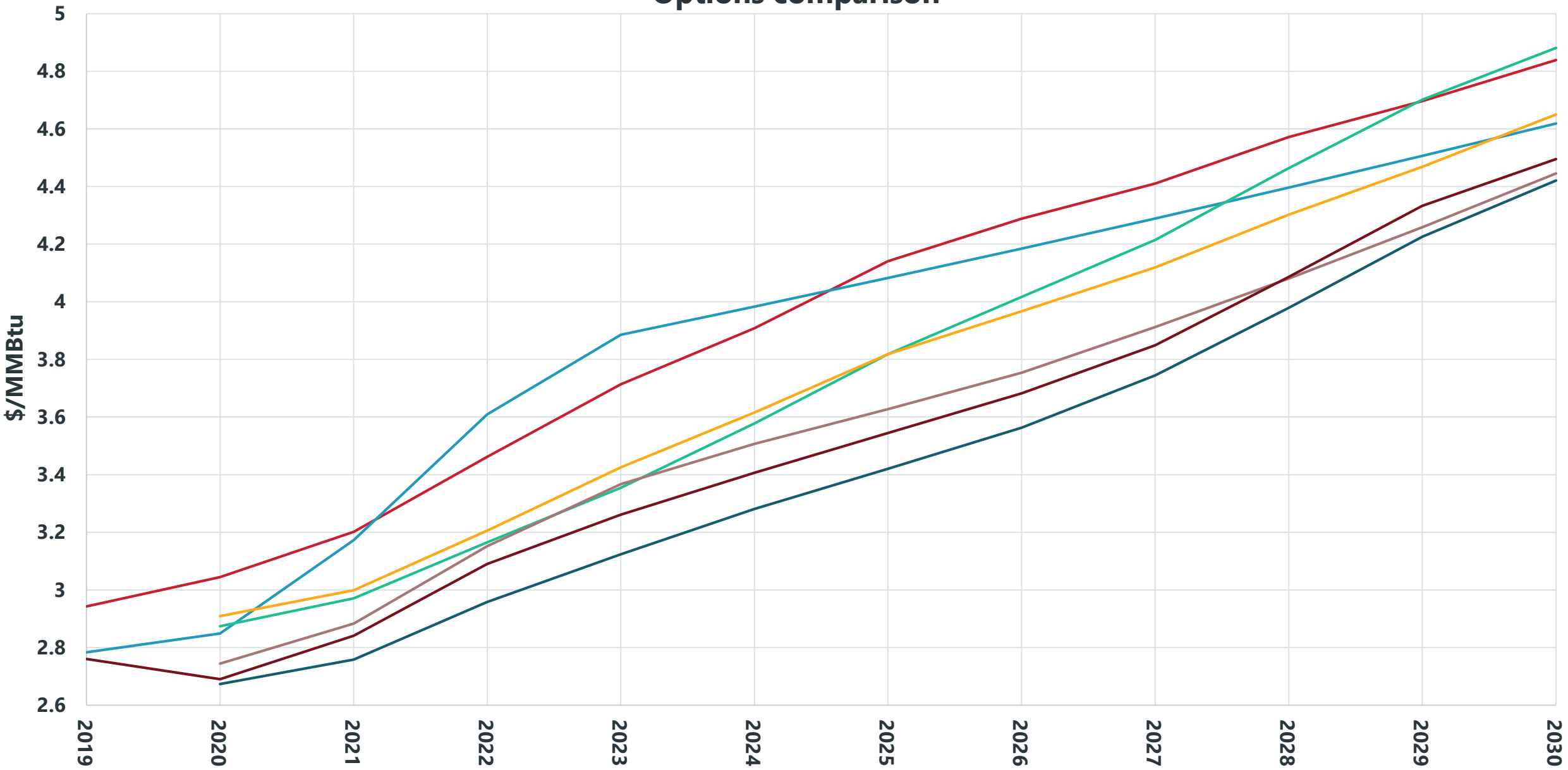
# COMPARISON OF DIFFERENT FUEL PRICE SOURCES



# 2021 ITP OPTIONS

- Option 1
  - Hybrid of 3 sources: Vendor data, 2 (public or private sources)
- Option 2
  - Hybrid of Vendor data and a public source
- Option 3
  - Hybrid of Vendor data and a private source

# Options comparison



# RECOMMENDATION

- SPP staff recommend using an average of Vendor data set and Wood Mackenzie for natural gas price data

# ITP MANUAL LANGUAGE (SECTION 2.2.1.7)

- "Fuel price forecasts for the reference case future, including natural gas, oil, uranium, coal, and associated transportation costs, will be based upon the latest vendor data set.
- Potential adjustments to the fuel prices for the non-reference case future(s) will be determined by the ESWG to appropriately reflect each future and will be described in the ITP study scope document."

SPP Southwest Power Pool

2021 ITP

# 2021 PROTOTYPES AND RP2

KIRK HALL

# OVERVIEW

- Today's Objective:
  - Discuss and approve waiver for resource planning software in 2021 ITP
  - Discuss and approve prototypes

# PREVIOUS PROTOTYPE SELECTIONS

- 2019 ITP selected 0 CCs using Strategist

| | Future 1 | | | Future 2 | | |
|---|---|---|---|---|---|---|
| | CC | CT | RE | CC | CT | RE |
| 2024 | 0 | 8 | 0 | 0 | 6 | 0 |
| 2029 | 0 | 15 | 1 | 0 | 15 | 0 |
| Total | 0 | 23 | 1 | 0 | 21 | 0 |

- 2020 ITP selected 0 CCs using Strategist

| | Future 1 | | Future 2 | |
|---|---|---|---|---|
| | CC | CT | CC | CT |
| 2025 | 0 | 8 | 0 | 28 |
| 2030 | 0 | 7 | 0 | 12 |
| Total | 0 | 15 | 0 | 40 |

# PREVIOUS DISCUSSION

- Focus on 2 Prototypes based upon 2019/2020 ITP studies
  - CCs/CTS
  - Utilize 3 main data sources (EIA, Lazard, NREL ATB)

# 2021 ITP STRATEGIST WAIVER

- Staff has discussed removing use of Strategist from the 2021 ITP Resource Plan Phase 2
  - Strategist results yielded 0 CCs for both 2019 and 2020 ITPs
  - Continued development of wind/solar, implementation of ESRs will provide enough energy to supply system needs
  - Prototype comparisons show very limited intersection between resource types further supporting expected selection of only CTs
  - Time & Money savings

# ITP MANUAL LANGUAGE

#### 2.2.2.1.2 Conventional Resource Expansion Plan

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.

The conventional resource expansion plan process begins with the identification of a publicly available source for generator prototype parameters, which shall be documented in the study scope.

Resource expansion software will be used in all futures to identify the optimal mix of new conventional resource additions needed for the SPP region.[26] The magnitude of resource additions will be based on resource shortfalls. Ownership of conventional unit additions will be allocated to pricing zones such that each pricing zone approximately meets the reserve margin requirement. Joint ownership of unit additions may be used to avoid excessive additions of new resources to individual pricing zones.

# RECOMMENDATION

- SPP staff recommends a waiver of the ITP manual for the 2021 ITP requiring the use of resource expansion software

# PROTOTYPE REVIEW

- 2019 ITP: Lazard LCEO '17

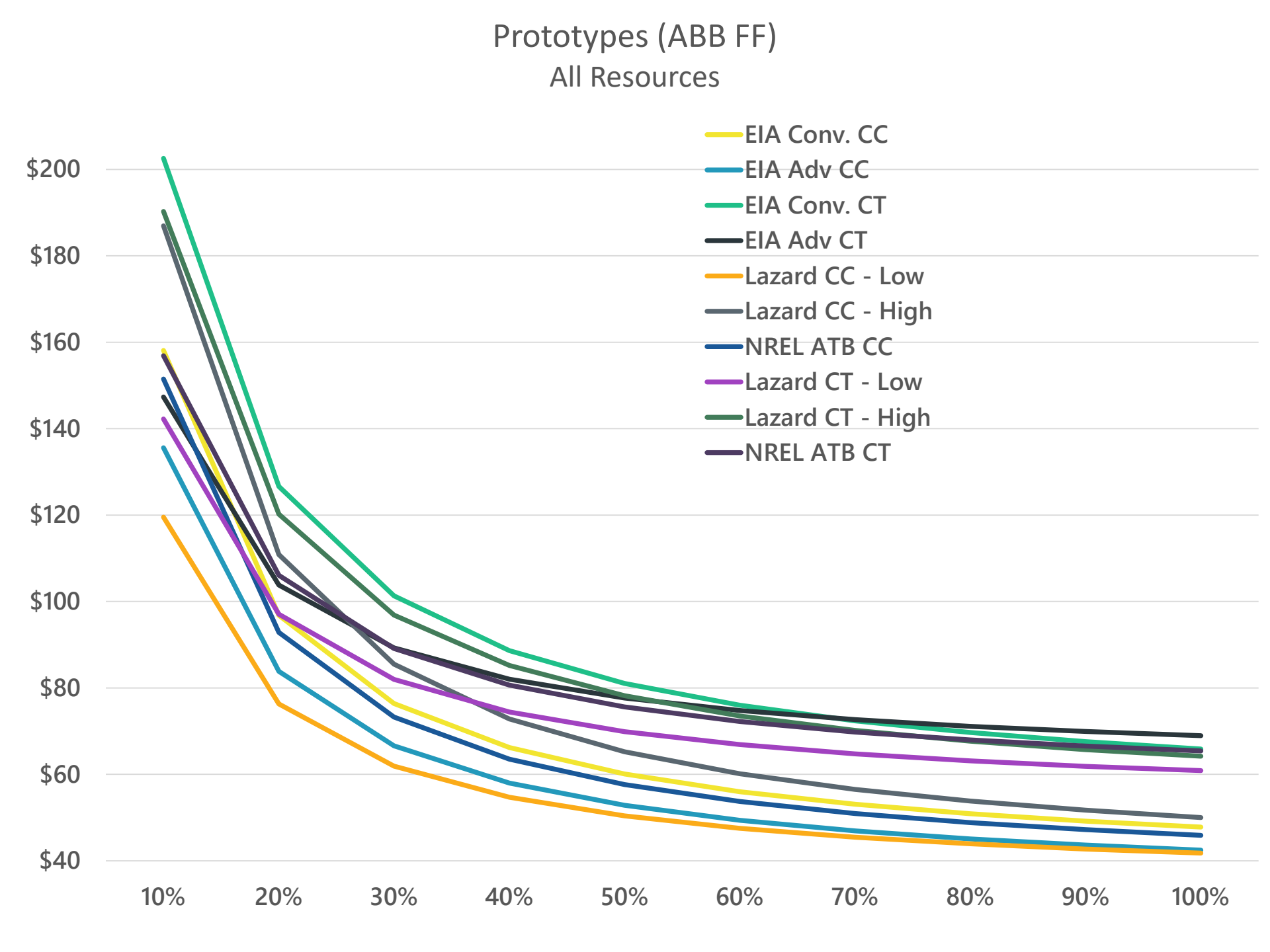
| Generation Type | Data Source | Tech Type | Size (MW) | Total Capital Cost ($/kW) | V O&M ($/MWh) | F O&M ($/kW-yr) | Heat Rate (Btu/kWh) |
|---|---|---|---|---|---|---|---|
| Combined Cycle (CC) | Lazard | High | 550 | 1,333 | 2.05 | 5.64 | 6,900 |
| Combustion Turbine (CT) | Lazard | Low | 216 | 820 | 4.82 | 5.13 | 10,300 |
| Gas Recip Engine | Lazard | Low | 50 | 897 | 12.82 | 17.94 | 8,500 |

- 2020 ITP: EIA AEO '18

| 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 '18 | Conv. | 702 | 1,007 | 3.63 | 11.39 | 6,600 |
| Combustion Turbine (CT) | EIA AEO '18 | Adv. | 237 | 697 | 11.08 | 7.04 | 9,800 |

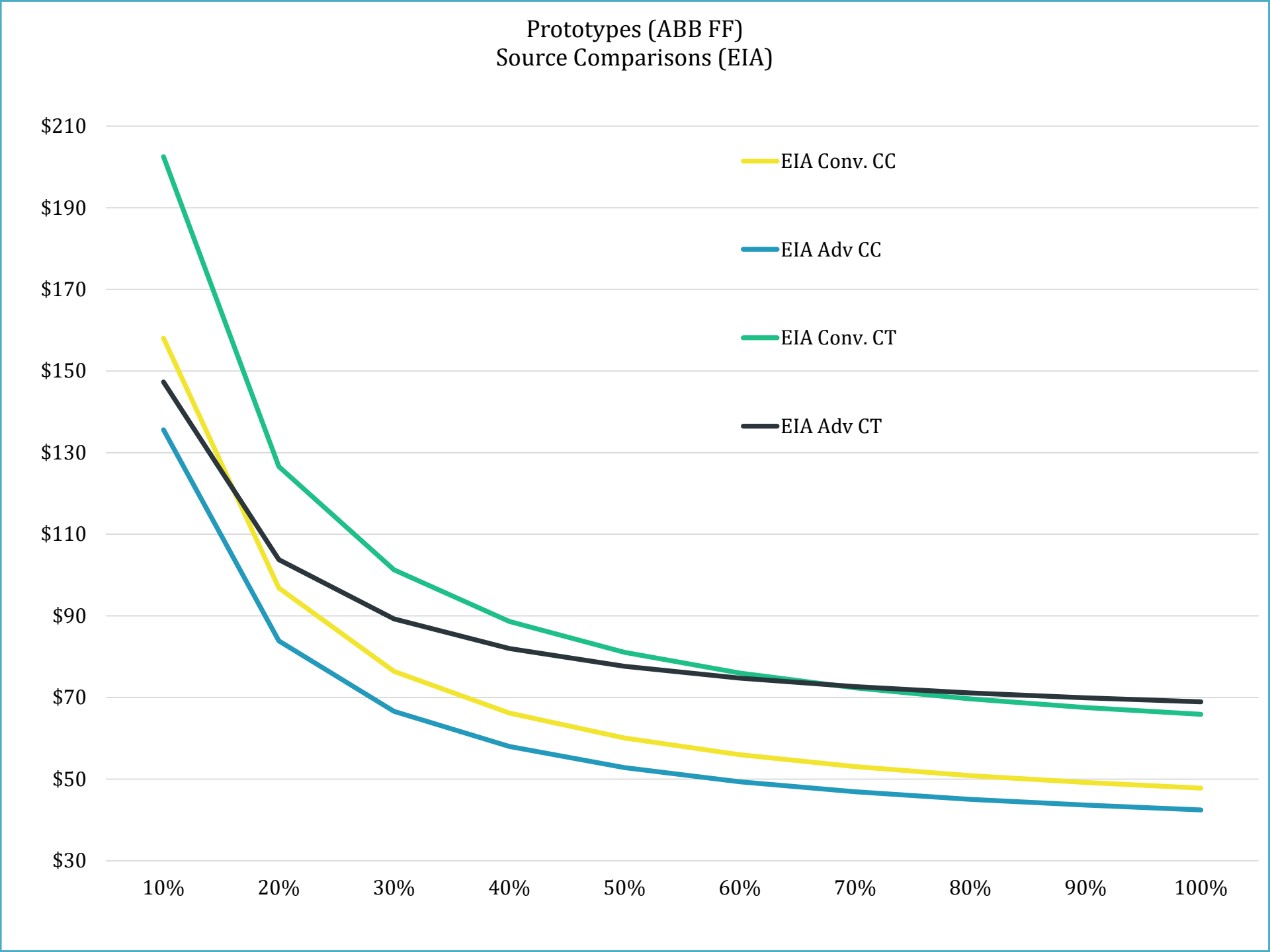
# PROTOTYPE COMPARISON (2021 ITP)

| Data Source | Generation Type | Tech Type | Size (MW) | Total Capital Cost ($/kW) | V O&M ($/MWh) | F O&M ($/kW-yr) | Heat Rate (Btu/kWh) |
|---|---|---|---|---|---|---|---|
| EIA AEO '19 | Combined Cycle (CC) | Conv. | 702 | 999 | 3.61 | 11.33 | 6600 |
| EIA AEO '19 | Combined Cycle (CC) | Adv. | 1100 | 794 | 2.06 | 10.3 | 6300 |
| EIA AEO '19 | Combustion Turbine (CT) | Conv. | 100 | 1126 | 3.61 | 18.03 | 9840 |
| EIA AEO '19 | Combustion Turbine (CT) | Adv. | 237 | 691 | 11.02 | 7.01 | 9800 |
| Lazard LCOE 12 | Combined Cycle (CC) | High | 550 | 1300 | 2.00 | 5.50 | 6900 |
| Lazard LCOE 12 | Combined Cycle (CC) | Low | 550 | 700 | 3.50 | 6.00 | 6133 |
| Lazard LCOE 12 | Combustion Turbine (CT) | High | 50 | 1000 | 10.00 | 20.00 | 8000 |
| Lazard LCOE 12 | Combustion Turbine (CT) | Low | 241 | 750 | 4.70 | 5.00 | 9804 |
| NREL ATB 2019 | Combustion Turbine (CT) | N/A | 100 | 750 | 7.00 | 12.00 | 9820 |
| NREL ATB 2019 | Combined Cycle (CC) | N/A | 702 | 906 | 3.00 | 11.00 | 6450 |


Prototypes (ABB FF)
All Resources
EIA Conv. CC
EIA Adv CC
EIA Conv. CT
EIA Adv CT
Lazard CC - Low
Lazard CC - High
NREL ATB CC
Lazard CT - Low
Lazard CT - High
NREL ATB CT
$200
$180
$160
$140
$120
$100
$80
$60
$40
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

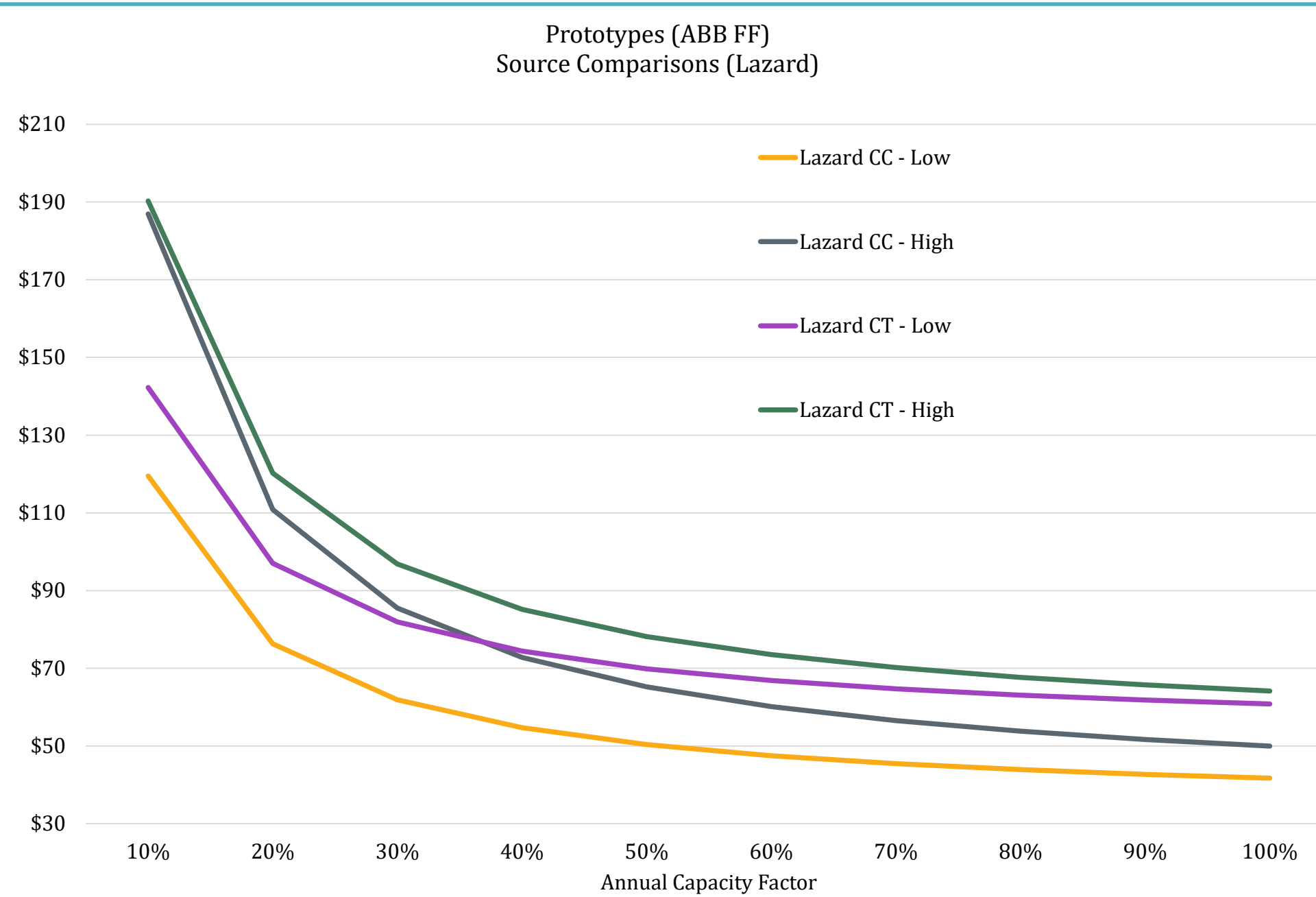
# PROTOTYPE COMPARISON (2021 EIA)

| Data Source | Generation Type | Tech Type | Size (MW) | Total Capital Cost ($/kW) | V O&M ($/MWh) | F O&M ($/kW-yr) | Heat Rate (Btu/kWh) |
|---|---|---|---|---|---|---|---|
| EIA AEO '19 | Combined Cycle (CC) | Conv. | 702 | 999 | 3.61 | 11.33 | 6600 |
| EIA AEO '19 | Combined Cycle (CC) | Adv. | 1100 | 794 | 2.06 | 10.3 | 6300 |
| EIA AEO '19 | Combustion Turbine (CT) | Conv. | 100 | 1126 | 3.61 | 18.03 | 9840 |
| EIA AEO '19 | Combustion Turbine (CT) | Adv. | 237 | 691 | 11.02 | 7.01 | 9800 |


Prototypes (ABB FF)
Source Comparisons (EIA)
$210
$190
$170
$150
$130
$110
$90
$70
$50
$30
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
EIA Conv. CC
EIA Adv CC
EIA Conv. CT
EIA Adv CT

# PROTOTYPE COMPARISON (2021 LAZARD)

| Data Source | Generation Type | Tech Type | Size (MW) | Total Capital Cost ($/kW) | V O&M ($/MWh) | F O&M ($/kW-yr) | Heat Rate (Btu/kWh) |
|---|---|---|---|---|---|---|---|
| Lazard LCOE 12 | Combined Cycle (CC) | High | 550 | 1300 | 2.00 | 5.50 | 6900 |
| Lazard LCOE 12 | Combined Cycle (CC) | Low | 550 | 700 | 3.50 | 6.00 | 6133 |
| Lazard LCOE 12 | Combustion Turbine (CT) | High | 50 | 1000 | 10.00 | 20.00 | 8000 |
| Lazard LCOE 12 | Combustion Turbine (CT) | Low | 241 | 750 | 4.70 | 5.00 | 9804 |


Prototypes (ABB FF)
Source Comparisons (Lazard)
$210
$190
$170
$150
$130
$110
$90
$70
$50
$30
Lazard CC - Low
Lazard CC - High
Lazard CT - Low
Lazard CT - High
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Annual Capacity Factor

# RECOMMENDATION

- SPP recommends the EIA AEO 2019 Advanced CT for the 2021 ITP prototype
  - If exceptions requested for CC resource, recommend utilizing the EIA AEO 2019 Conventional CC prototype

SPP Southwest Power Pool

2021 ITP

# 2021 ITP PORTFOLIO CONSOLIDATION-SCOPE

AMBER GREB

# OBJECTIVE

- Review previous consolidation methodologies
- Discuss direction for the 2021 Consolidation

*Goal of the Final Portfolio:*

- *Develop a regional plan that provides reliable and economic delivery of energy and facilitates achievement of public policy objectives, while maximizing benefits to the end-use customer*

# ITP MANUAL LANGUAGE

Section 6.2 Portfolio Consolidation

To determine a recommended plan, the portfolios of potential projects must be consolidated. SPP and stakeholders will discuss, determine and document details of the study-specific consolidation criteria during each study scope development.

# HISTORICAL CONSOLIDATION CONCEPTS

- Coupling Criteria
  - Generally gives more emphasis to one future over the other and allows projects from other future to be included if additional criteria is met
- Weighted Futures
  - Weighting of futures determined based on confidence in each future
  - Project selected if weighted sum of B/C ratios from futures exceeds threshold
- Individual Project Review
  - Review project drivers and benefits if B/C ratio exceeds certain threshold and present the project and justification to the appropriate stakeholder groups for approval

# CONSIDERATIONS FOR SCENARIOS 2 & 3

| No. | Considerations | Possible Points | Threshold |
|---|---|---|---|
| 1 | 40-yr (1-year) APC B/C in Selected Future | 50 | 1.0 (0.9) |
| | 40-yr (1-year) APC B/C in Opposite Future | | 0.8 (0.7) |
| | 40-yr (1-year) APC Net Benefit in Selected Future ($M) | | N/A |
| | 40-yr (1-year) APC Net Benefit in Opposite Future ($M) | | N/A |
| 2 | Congestion Relieved in Selected Future (by need(s), all years) | 10 | N/A |
| | Congestion Relieved in Opposite Future (by need(s), all years) | 10 | N/A |
| 3 | Operational Congestion Costs or Reconfiguration ($M/yr or hrs/yr) | 10 | >0 |
| 4 | New EHV | 7.5 | Y/N |
| 5 | Mitigate Non-Thermal Issues | 7.5 | Y/N |
| 6 | Long Term Viability (Eg 2013 ITP20) | 5 | Y/N |
| | **Total Points Possible (70 point Threshold in Scenario 3)** | **100** | |

## 2021 Questions

- Are these the appropriate considerations to look at?
- Are they weighted correctly? (Points possible)
- Should we change the thresholds?
- Should we change the minimum point requirements?

# 2021 CONSOLIDATION CONSIDERATIONS

- How did we get here?
  - 2019 ITP Survey results showed a strong preference for 40 year NPV project benefits as a consideration
  - Stakeholder discussions led to B/C ratio for threshold and Net benefit for calculation of consideration 1
- Have we changed our minds?
  - If we sent out the survey today, would we get the same results
- What confidence levels do we have in each future?
  - 50/50 in the 2019 and 2020 ITPs

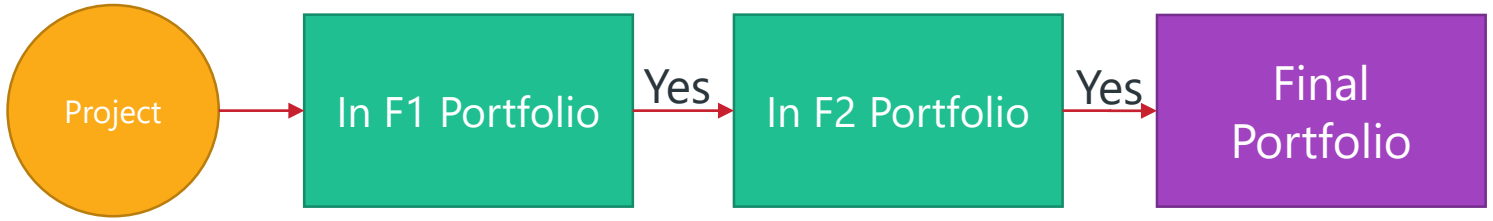
# APPENDIX

# Portfolio Consolidation
## Scenarios

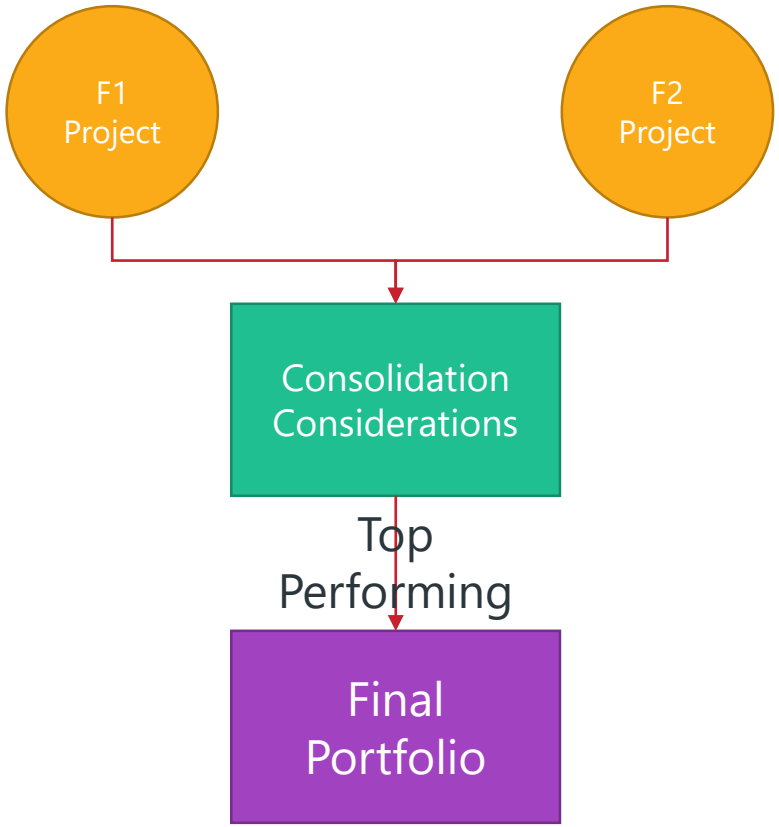
| Scenarios | F1 | F2 | Should we build? | What should we build? |
|---|---|---|---|---|
| Same project in each future | Project A | Project A | ✓ | ✓ |
| Competing projects | Project B | Project C | ✓ | ? |
| Projects in one future | N/A | Project D | ? | ✓ |

# Portfolio Consolidation

## Same project in both portfolios

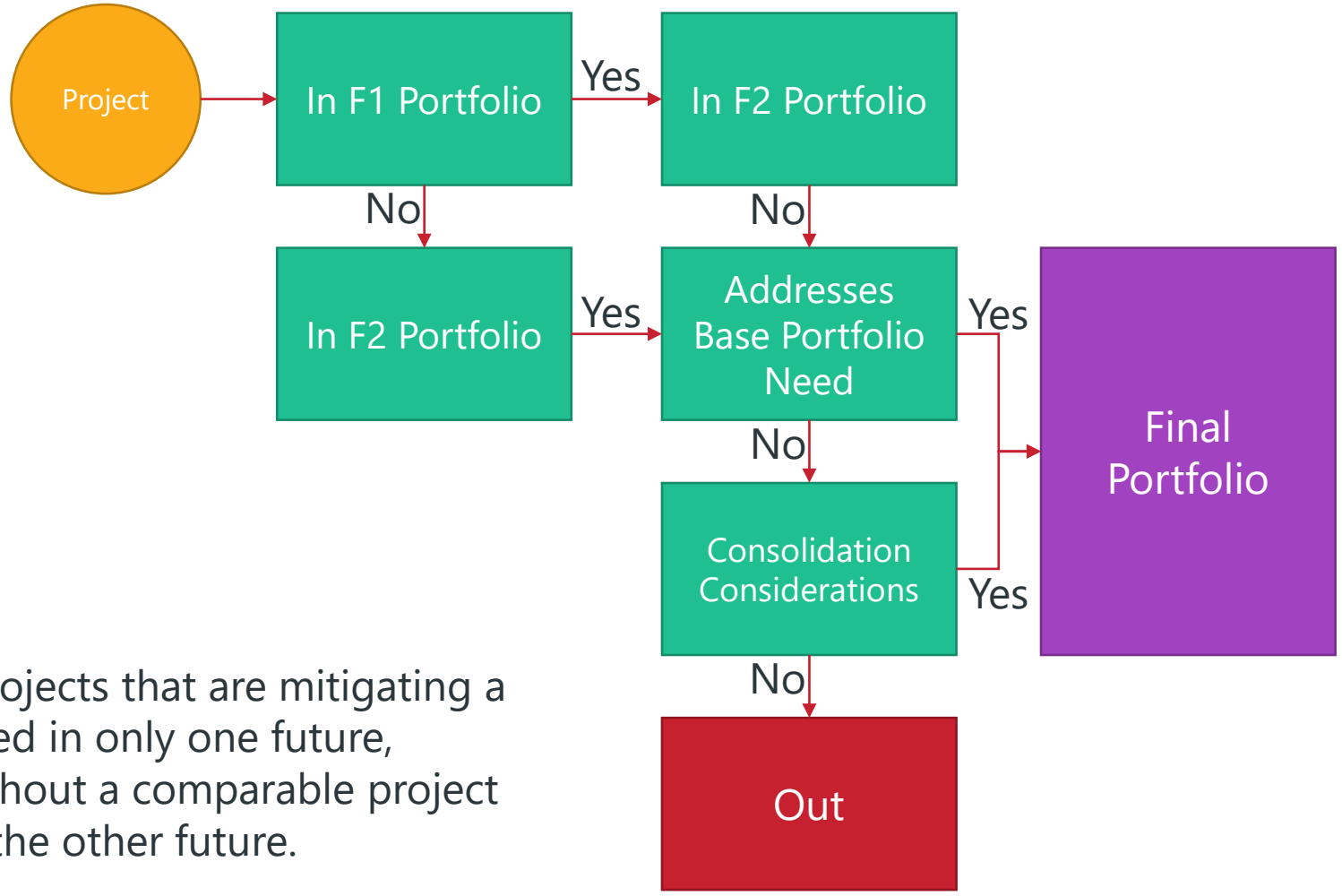


# Portfolio Consolidation
## Competing Projects



# Portfolio Consolidation

## Projects in one future's portfolio




*Projects that are mitigating a need in only one future, without a comparable project in the other future.

# CONSOLIDATION CALCULATIONS
## CONSIDERATION 1

### Scenario 2 (Competing Projects)

1. Test B/C Thresholds in Opposite Future
   - If project has less than 0.8 40-year B/C in opposite future, zero points will be awarded
   - If project meets 0.8 40-year B/C threshold in opposite future, continue calculations
2. Calculate Net APC Benefits
   - $Net\ APC\ Benefit_{P1,AVE} = \frac{Net\ APC\ Benefit_{P1,F1} + Net\ APC\ Benefit_{P1,F2}}{2}$
   - $Net\ APC\ Benefit_{P2,AVE} = \frac{Net\ APC\ Benefit_{P2,F1} + Net\ APC\ Benefit_{P2,F2}}{2}$
   - $Net\ APC\ Benefit_{Max} = Maximum(Net\ APC\ Benefit_{P1,AVE}, Net\ APC\ Benefit_{P2,AVE})$
3. Calculate Points Awarded
   - $Points\ Awarded_{P1} = 50 \times \frac{Net\ APC\ Benefit_{P1,AVE}}{Net\ APC\ Benefit_{Max}}$
   - $Points\ Awarded_{P2} = 50 \times \frac{Net\ APC\ Benefit_{P2,AVE}}{Net\ APC\ Benefit_{Max}}$

# CONSOLIDATION CALCULATIONS
## CONSIDERATION 1

Scenario 3 (Projects in one future's portfolio)

1. Test B/C Threshold in Opposing Future
   - If project has less than 0.8 40-year B/C in opposing future, zero points will be awarded
   - If project has at least 1.0 40-year B/C in opposing future, 50 points will be awarded
   - If project meets 0.8 40-year B/C threshold in opposing future, but is less than 1.0, continue calculations
2. Calculate Net APC Benefits
   - $Net\ APC\ Benefit_{P1,AVE}$
   - $Net\ APC\ Benefit_{P1',AVE} = Net\ APC\ Benefit_{P1,AVE}\ with 1.0\ B/C\ in\ opposing\ future$
3. Calculate Points Awarded
   - $Points\ Awarded_{P1,\%} = 50 \times \frac{Net\ APC\ Benefit_{P1,AVE}}{Net\ APC\ Benefit_{P1',AVE}}$

# CONSOLIDATION CALCULATIONS
## CONSIDERATION 1

Scenario 3 (Projects in one future's portfolio)

| | Project 1 | Project 1' |
|---|---|---|
| **Total Project Cost ($M)** | **10.3** | **10.3** |
| 40-yr APC B/C in Selected Future | 1.9 | 1.9 |
| 40-yr APC B/C in Opposite Future | 0.9 | 1.0 |
| 40-yr APC Net Benefit in Selected Future ($M) | 9.3 | 9.3 |
| 40-yr APC Net Benefit in Opposite Future ($M) | -1.0 | 0.0 |

1. Test B/C Threshold in Opposing Future
2. Calculate Net APC Benefits
   - $Net\ APC\ Benefit_{P1',AVE} = \frac{\$9.3M - \$1.0M}{2} = \$4.1M$
   - $Net\ APC\ Benefit_{P1',AVE} = \frac{\$9.3M + \$0.0M}{2} = \$4.6M$
3. Calculate Points Awarded
   - $Points\ Awarded_{P1,\%} = 50 \times \frac{\$4.1M}{\$4.6M} = \mathbf{44.4}$

# CONSOLIDATION CALCULATIONS

- Consideration 2
  - Points for consideration two will be calculated as the percentage of total congestion relieved on the needs addressed by the project, multiplied by the points possible.

$$Points\ awarded = 10 \times \%\ Congestion\ relieved_{F1,addressed\ needs} + 10 \times \%\ Congestion\ relieved_{F2,addressed\ needs}$$

- Consideration 3
  - Points for consideration three will be calculated based on the severity of an operational issue that the project is expected to address, as a percentage of the operational needs criteria multiplied by the points possible, up to 10.
  - $Points\ awarded = \left(\frac{\$\ of\ congestion\ cost_{24\ months}}{\$10M}\right) \times 10$
  - OR
  - $Points\ awarded = \left(\frac{Hours\ of\ system\ reconfiguration_{12\ months}}{X\% \times 8{,}760}\right) \times 10$
- Consideration 4*
  - All possible points awarded if new EHV
- Consideration 5*
  - All possible points awarded if expected to mitigate non-thermal issues
- Consideration 6*
  - All possible points awarded if in SPP long-term study

*No points awarded if criteria not met

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2021 **ITP**

# 2021 ITP SCOPE SENSITIVITIES

JAMES BAILEY

NOVEMBER 6-7, 2019

# OBJECTIVE

- Inform stakeholders of sensitivity options for the 2021 ITP assessment
- Select and approve sensitivity options for 2021 ITP scope
- Provide ITP Manual revision request update

# BACKGROUND: ITP MANUAL LANGUAGE (SECTION 7.2)

Sensitivity analyses will be defined in the scope and conducted to measure the flexibility of the final portfolio in each ITP assessment. Generally, these sensitivities will not be used to select the proposed transmission projects, nor to filter out projects. The sensitivities to be performed on the final portfolio of each ITP assessment shall include, at a minimum:

- High natural-gas price
- Low natural-gas price
- High demand
- Low demand

Typically, for the demand sensitivities, one standard deviation on either side of the expected values will be used, and for the natural gas price sensitivities, two standard deviations of expected values will be used.

# REQUIRED SENSITIVITIES

- For 2019 ITP and 2020 ITP assessments, ESWG approved using ITP Manual suggested methodologies for demand and natural gas price sensitivities
  - ±1 standard deviations for high and low demand sensitivities
  - ±2 standard deviations for high and low natural gas sensitivities

# ADDITIONAL SENSITIVITIES

- Individual and/or comprehensive sensitivities to proxy previously recommended third future (mandated carbon reduction)
  - Carbon adders
  - Increased wind (36.5-41.5 GW) and solar (9-14 GW)
  - Increased storage & increased fossil fuel retirements
  - Increased energy demand *(leverage required sensitivity work)*
  - Increased natural gas prices *(leverage required sensitivity work)*

# RECOMMENDATIONS

- Staff recommends that natural gas and demand sensitivities be performed for the 2021 ITP assessment using the methodologies laid out in the current ITP Manual
- Staff recommends that sensitivities be performed for the 2021 ITP to proxy the previously recommended third future assumptions individually and comprehensively

# SECTION 7.2 REVISION REQUEST UPDATE

- Revision Request drafted to relax required sensitivity requirements and require sensitivity development in conjunction with futures development


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HELPING OUR MEMBERS WORK TOGETHER
TO KEEP THE LIGHTS ON... TODAY AND IN THE FUTURE.

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2021 ITP

# 2021 ITP LOAD AND GENERATION REVIEW

LIZ GEPHARDT

NOVEMBER 6-7, 2019

# STAKEHOLDER REVIEW

- Guidelines for workbooks
  - Yellow tabs and columns are open for stakeholders to make edits
    - Highlight changes
  - Green tabs are primarily vendor data and stakeholders *do not* need to make updates
    - Stakeholders can provide updates to green tabs but with justification
    - SPP staff will consider utilizing provided updates if specific units are found to not operate as expected

2021 **ITP**

# RESOURCE ADDITION REQUESTS

# 2021 ITP WAIVER/RAR APPLICATION RESULTS


*Capacity automatically included in market models is included in the potential BR capacity

2021 **ITP**

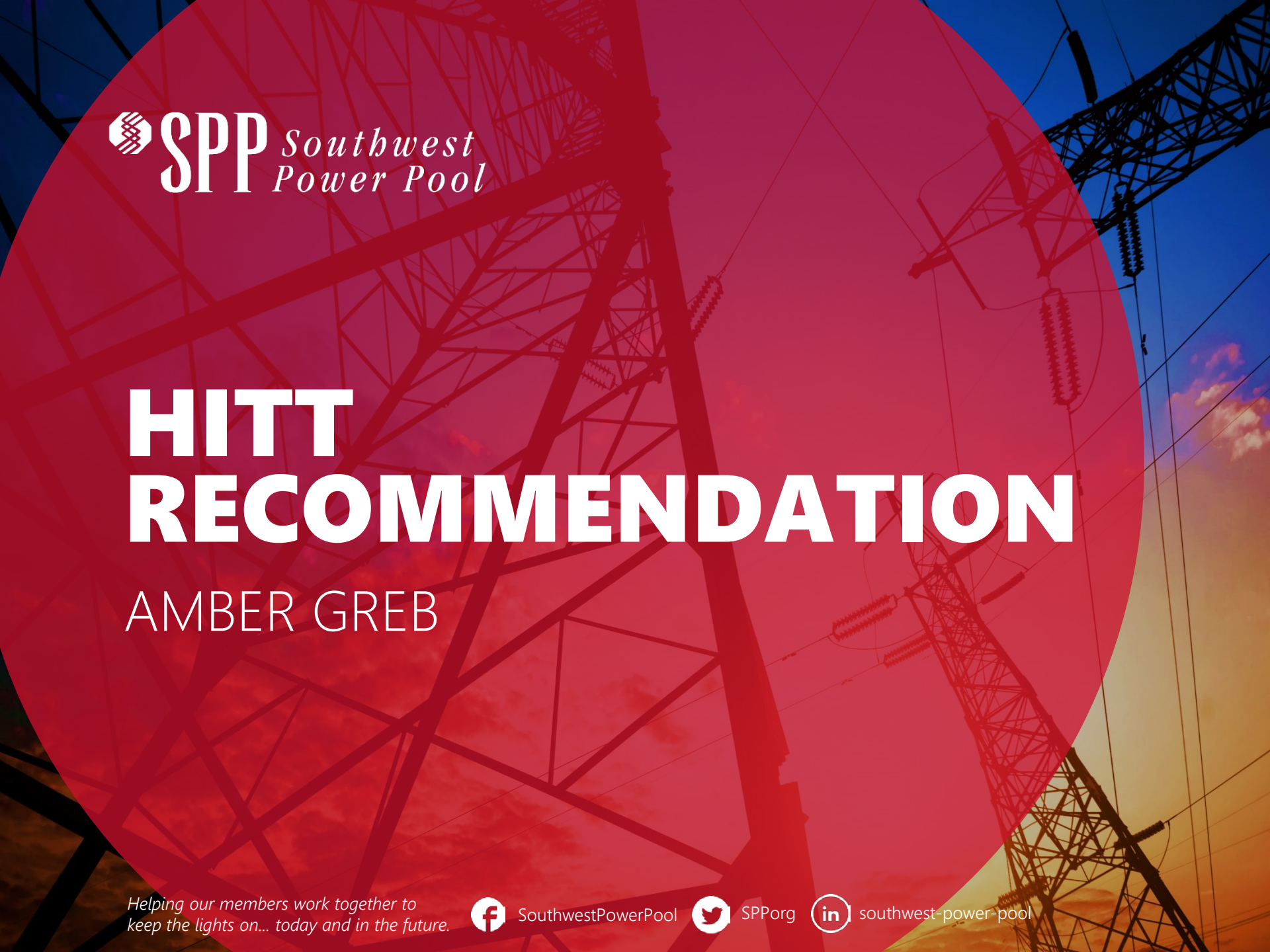
# APPENDIX

# GEN AND LOAD REVIEW OVERVIEW

- Timeline
  - August 2019 – February 2020
  - Stakeholder review starts in September
  - Generation and Load locked in Mid-January
  - Working Group Final Approval in February
- Study years
  - 2023, 2026, 2031
- Vendor data
  - 2018 Fall NERC Nodal Simulation Ready Model from ABB
  - MTEP20 from MISO
- Internal and external Gen and Load performed in parallel

# STAKEHOLDER REVIEW

- Generation and Load Workbooks
  - Pass 1 Trial 2 to be posted 11/15/2019
  - Feedback due via RMS by 12/6/2019
- Resource Addition Request (RAR) and Waiver Request
  - Inclusion Criteria Outline
    - Base Reliability Models – ITP Manual Section 2.1.1.1
    - Economic Models – ITP Manual Section 2.2.1.4
  - ESWG RAR approvals at 12/11-12 meeting



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# HITT RECOMMENDATION

AMBER GREB

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

SouthwestPowerPool SPPorg southwest-power-pool

# OBJECTIVE

- Review the HITT Recommendation
- 40yr vs. 20yr
- Previously Approved Projects B/Cs
- Next steps

# TRANSMISSION PLANNING RECOMMENDATION #5

- Evaluate the benefit-to-cost ratio for economic projects
  - Action: The ESWG should evaluate and make a recommendation to the MOPC on whether SPP should increase the B/C ratio for economic projects to between 1.05 to 1.25
- Previous ESWG discussion
  - October 2019 – Time Value of Money, Discount Rate, MISO Comparison, and Comparison to other Financial Products

# 40YR VS. 20YR

- 2019 ITP
  - If 20yr benefits and a 1.25 B/C ratio were utilized in the 2019 ITP, all the recommended projects still would have been eligible for approval
    - Based on current consolidation and scoring methodology

# 40YR VS. 20YR COMPARISON – 2019 ITP ECONOMIC PROJECTS

- **Future 1**
  - Average – 20yr B/Cs were 5.54% Lower than 40yr B/Cs
  - Median – 20yr B/Cs were 7.56% lower than 40yr B/Cs
  - Largest Difference 21.73%
- **Future 2**
  - Average – 20yr B/Cs were 10.08% Lower than 40yr B/Cs
  - Median – 20yr B/Cs were 9.91% lower than 40yr B/Cs
  - Largest Difference 14.27%

# PREVIOUSLY APPROVED ITP PROJECTS

- 2017 ITP-10
  - No economic projects were recommended between a 1.0 and 1.25 B/C
- 2019 ITP
  - No economic projects were recommended between a 1.0 and 1.25 B/C

# NEXT STEPS

- SPP staff to continue to discuss the HITT request and provide a staff recommendation at the December ESWG
- Provide information on Cost Estimates to the group at the December ESWG

# SCHEDULE

- November 2019 – January 2020
  - ESWG discussion and Approval
    - December 2019 SPP Staff Recommendation
- January-March 2020
  - RTWG review/approval
- March – April 2020
  - Develop/approve Revision Request
- April 2020
  - MOPC approval

SPP Southwest Power Pool

2021 ITP

# ACTION ITEM 201 - REVIEW THE INTERCHANGE METHODOLOGY

CHRIS JAMIESON

# OVERVIEW

- Review applicable ITP Manual Requirements and Benefit Metric Manual References
- Review stakeholder and staff observations
- Review SPP staff 2021 ITP Scope addition recommendation
- Review next steps for 2021 ITP Economic Model Build

# APPLICABLE ITP MANUAL REQUIREMENTS

- Section 2 Model Development
  - 2.2 Market Economic Model Overview/2.2.1 Model Assumptions and Data/2.2.1.9 Hurdle Rates

    Hurdle rates for all futures will be based upon the latest vendor data set. Any adjustments to the hurdle rates will be determined by the ESWG and will be described in the ITP study scope document.
  - 2.3 Market Powerflow Model Overview/2.3.1 DC/AC Conversion/2.3.1.3 Interchange

    Economic model simulation will determine the exchange of energy between SPP and neighboring systems.
- Section 3 Benchmarking/3.2 Economic Model

  The year 2 economic model will be utilized to validate modeling parameters to determine if operation is reflective of the SPP system. Data validation may include: capacity factor by unit type, maintenance outages, operating and spinning reserves, average energy costs, system LMPs (zonal, average, max, etc.), interchange, APC comparison, and renewable generation profiles. Data may be compared to the most recent SPP operational data and previous study models.

# BENEFIT MANUAL REFERENCES

- Section 8 Increased Wheeling Through and Out Revenues
  - 8.2 Description

    Increasing ATC with neighboring regions improves import and export opportunities for the SPP footprint. Increased inter-regional transmission capacity that increases through and out transactions will also increase SPP wheeling revenues. **While the energy revenue benefit of increased exports is captured by the APC Savings metric (which values exports at the weighted average generation LMP of the exporting zone)**, the APC Savings metric does not capture any increases in wheeling out or wheeling through revenues associated with increased transfer capability. The wheeling revenues collected are not counted in either the exporting or importing region's APC. These increased wheeling revenues are a benefit as they will offset part of the transmission projects' revenue requirements. Currently, SPP collects wheeling revenues through Schedules 7, 8, and 11 for through and out transactions.

# BENEFIT MANUAL REFERENCES

- Section 8 Increased Wheeling Through and Out Revenues
  - 8.2.2 Non-Firm Transactions

    The long-term firm service calculation will not capture the sale of non-firm hourly wheeling service that is sold based on short-term market conditions. These non-firm exports generate wheeling revenue in addition to the sale of long-term wheeling service.

    **In order to capture these "economy-energy" export transactions, production cost modeling simulations will utilize "hurdle rates" for market-based export transactions in order to account for a non-firm hourly service rate plus market friction.** These production cost modeling tools can estimate non-firm ATC export values by adding definitions of export interfaces. Additional MW are multiplied by the SPP average rate for non-firm hourly wheeling service ($/MWh) to determine the non-firm wheeling benefit.

    Wheeling revenues due to non-firm transactions are currently calculated for informational purposes only, and are not currently used to evaluate benefits of new (or existing) transmission.

# DRAFT STAKEHOLDER AND STAFF OBSERVATIONS

- Potential need to periodically review the reasonableness of latest vendor data hurdle rates and whether or not they continue to reasonably reflect regional non-firm transmission wheeling rates and market friction (hurdles/incentives)
- Potential need to periodically review other RTOs Economic Model hurdle rate assumptions
- Potential need to review and rationalize Economic Model interchange beyond benchmarking year 2 interchange
- Potential need to assess the impact of any reporting differences between Real-Time Operational and Market Economic Model Interchange
- Potential need to review how increased renewable development and respective lowering of SPP's wholesale energy prices have on Real-Time Operational and Economic Model Interchange
- Potential need to review how hurdle rates impact Economic Model Dispatch, Interchange, and Benefit Metrics
- Potential need to review interchange assumptions between simulating SPP, first and second tier regions (MISO, AECI, and TVA) and non-simulating regions (PJM and SOCO) and associated impacts on Market Economic Model performance and results

# SPP STAFF 2021 ITP SCOPE ADDITION RECOMMENDATION

Under Section 2: Assumptions for SPP Market Economic Model

***Hurdle Rates and Interchange***

Hurdle rates for all futures will be based upon the latest vendor data set. However, prior to and during the Market Economic Model benchmarking and initial Y5 and Y10 Economic Model Builds, SPP Staff and ESWG will be reviewing the reasonableness of the latest vendor data set hurdle rates and respective interchange. SPP Staff and ESWG may utilize, as appropriate, prior ITP assessment Market Economic Models in this review. This review may result in adjustments to the Market Economic Model hurdle rates and/or other Market Economic Model parameters that impact Market Economic Model inter-regional "economy-energy" transactions. Any ESWG approved adjustments and Market Economic Model interchange results will be documented in the ITP assessment report.

# NEXT STEPS

- Solicit additional member feedback and priority on items to be reviewed (December 2019)
- Prioritize items to be reviewed based on feedback and schedule impacts (December 2019)
- Provide scope of work and schedule for 2021 ITP Economic Build to ESWG (January 2019)

SPP Southwest Power Pool

2021 **ITP**

# ACTION ITEM 202: EVALUATE WIND TURBINE HEIGHT

JAMES BAILEY

NOVEMBER 6-7, 2019

# OBJECTIVE

- Inform stakeholders of wind profile methodology enhancements currently being evaluated

# BACKGROUND

- Existing wind resources currently being modeled using 100 meter wind profiles
  - Data readily available from NREL
  - 100 meter assumption results in over-estimation of wind energy by approximately 5%
  - Percent over-estimation decreases as resource plan units are added assuming actual 100 meter hub height
  - Some level of assumed repowering of existing resources further decreases over-estimation
- Evaluating options for methodology enhancements for existing wind resources to reduce energy over-estimation

# METHODOLOGY 1 (PREFERRED)

- Develop 80 meter and other power output profiles using NREL wind speed data and power curves
- Not readily available from NREL compared to 100 meter profiles
- Meeting with NREL staff for guidance
- Requires new automation development

# METHODOLOGY 2 (STATUS QUO)

- Continue using 100 meter power output profiles
- Potentially justifiable in some situations due to repowering assumptions
- No additional automation development

# METHODOLOGY 3

- Continue using 100 meter power output profiles but reduce annual energy as appropriate for existing resources based on their hub heights
- Profiles scaled by PROMOD such that they **do not** reach maximum capacity
- No additional automation development

# NEXT STEPS

- Discussions with NREL, ABB, and MISO
- Evaluate milestone requirements and schedule impacts of various methodologies
- Goal to bring recommended plan of action to December ESWG

# MOPC ACTION ITEM: BAKKEN LOAD

LIZ GEPHARDT

NOVEMBER 6-7, 2019

# OBJECTIVE

- Introduce Bakken area load to group
- Discuss options for incorporation into the 2021 ITP

# BAKKEN LOAD POCKET OVERVIEW

- Williston area in the northwest corner of the eastern interconnect
- Oil and gas production in area increasing dramatically
- Area generation
  - Hydro, wind, internal combustion units
- Reactive supply concerns during winter peaking conditions
- New Roundup to Kummer Ridge 345 kV line
  - 2016 ITPNT NTC
  - Later withdrawn due to load forecast uncertainties
- Charlie Creek – Watford 230 kV for the loss of Charlie Creek – Patent Gate 345 kV
  - Top 2019 ITP cost driven operational economic need flowgate for information purposes
  - High dependency on internal combustion units
- Potential additional/modified delivery points currently in AQ process
  - SPP tariff requires completion of study for inclusion in ITP models

# DRIVERS

- Modify Attachment AQ process
  - Delivery-point additions, modifications, or abandonments
- Attachment AQ process should
  - Be more transparent
  - Allow for quicker results to facilitate potential load growth
  - Be modified to limit application to new load, modification to loads, and load retirements that need to be addressed outside ITP due to timing or other significant reason

- *HITT Item T3*
  - *Implement new load addition modifications*
- MOPC Action Items
  - TWG and ESWG to recommend best way to incorporate Basin's concerns about winter peaking Bakken area load and generation supply issues in the 2021 ITP.
  - *TWG and ESWG to develop approaches that address winter peaking and cold-weather driven reliability issues for incorporation in SPP's normal planning processes.*
- *Probabalistic assessment in SPP planning processes*
- *Sask interested in exploring cost sharing of upgrades that increase import capability*

# SPP PLANNING OPTIONS

- Attachment AQ
  - Limited scope
- ITP Assessment
  - Addresses reliability, economic, and policy needs
  - Target Area additional analysis via economic needs assessment
- High Priority Study
  - Limited SPP staff resources
  - Similar process and results as ITP assessment

# 2021 ITP OPTIONS

- Option 1
  - Include known/studied load in base models
  - Develop additional sensitivity models with unstudied/new loads
  - Similar to Lubbock analysis in 2019 ITP
  - Document in scope and schedule
- Option 2
  - Inclusion of all load in base models
  - Expedited SPP tariff and ITP Manual Revision Request for January MOPC/BOD
  - Scope and schedule for incorporation along with 2020 ITP NTCs
  - MDWG Schedule and Compliance concerns
- Option 3
  - Inclusion of all load in base models
  - SPP tariff waiver to FERC for 2021 ITP only
  - Scope and schedule for incorporation along with 2020 ITP NTCs (assuming AQ process completes)
  - MDWG Schedule and Compliance concerns

# 2021 ITP STRAWMAN RECOMMENDATION

- In 2021 ITP Scope and schedule, document how additional incremental SPP tariff approved gen, load, and topology updates will be accommodated in the load pocket up to finalizing models by November 2020 upon BOD approval of 2020 ITP NTC recommendations
- Explore ESWG/TWG sponsored SPP tariff and ITP Manual revision request to document a waiver process to include incremental load additions/modifications in ITP base models and respective project tracking requirements that may be required
- Depending on AQ and incremental ITP model development outcomes, scope Target Area additional analysis to not only properly account for the unique characteristics of the load pocket but also build incremental load sensitivity models as needed to properly develop long-term solutions for the area

# NEXT STEPS

- Discussion at TWG meeting November 20-21
- Potential language for SPP tariff, ITP Manual RR, and 2021 ITP Scope