Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

May 20th - 21st, 2015

Sheraton Downtown, Oklahoma City, OK

• SUMMARY OF ACTIONS TAKEN •

1. Approved the March 31st - April 1st, and May 1st, 2015 meeting minutes.
2. Adopted the changes to the representation and voting structure section of the ESWG charter.
3. Approved a motion to maintain the reserve margin at 13.6% for resource planning in the 2017 ITP10 study
4. Approved the use of actual wind accreditation values for wind farms with 3 years of historical data, and to follow SPP criteria for wind farms with less than 3 years of historical data.
5. Approved a motion to follow SPP criteria for accreditation of solar resources.
6. Voted to utilize the status quo methodology for modeling of fuel, wind, and emissions prices (Ventyx reference case, NYMEX futures, DOE growth rates).
7. Approved removing the must run flag for all base load units, except nuclear, for all three futures.

Southwest Power Pool

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

May 20th - 21st, 2015

Sheraton Downtown, Oklahoma City, OK

• MINUTES •

Agenda Item 1 – Administrative Items

Agenda Item 1a - Call to Order, Introductions

Chair Alan Myers (ITC Great Plains) called the meeting of the Economic Studies Working Group (ESWG) to order at 8:00 AM, welcomed those in attendance, and asked for introductions.

There were 26 in person attendees and 41 web conference participants representing 12 of 12 ESWG members. (Attachment 1 – May 20-21st, 2015 Attendance List)

Agenda Item 1b – Receipt of Proxies

Alan Myers (ITC Great Plains) asked for any proxy statements. One proxy was identified; Bennie Weeks (SPS) named Jason Schmidt (Xcel Energy) as her proxy. (Attachment 2 – Proxy Statements)

Agenda Item 1c – Review of Agenda

Chair Alan Myers (ITC Great Plains) presented the agenda for review and asked for any additions or corrections. (Attachment 3 – May 20-21st, 2015 Agenda)

Kurt Stradley (LES) made a motion; seconded by Leon Howell (OGE) to adopt the agenda. The motion was approved unanimously.

Agenda Item 2 – Review of Past Action Items

Kelsey Allen (SPP Staff) reviewed the past action items. Item 076, to analyze the aggregate studies impact on the 2015 ITP10, was marked complete. The process of incorporating NTC projects issued after approval of the ITP powerflow models will be documented in the ITP Scope. (Attachment 4 – Past Action Items)

Agenda Item 3 – Consent Agenda

The Consent Agenda included the following items:

Approval of Meetings Minutes – March 31st - April 1st, 2015 (Attachment 5 – ESWG 03.31.15 Minutes)
Approval of Meetings Minutes – May 1st, 2015 (Attachment 6 – ESWG 05.01.15 Minutes)

The consent agenda was approved unanimously.

Agenda Item 4 – Study Schedules

Agenda Item 4a – SPP-MISO CSP & Regional Review

Juliano Freitas (SPP Staff) updated the group on the SPP-MISO CSP Schedule. Staff is currently working on solution refinement, report development, and interregional cost allocation. Sensitivities will begin in June. The regional review is set to start on May 28th. (Attachment 7 – SPP-MISO CSP & Regional Review Schedule)

Agenda Item 4b – 2017 ITP10 Schedule

Juliano Freitas (SPP Staff) updated the group on the 2017 ITP10 Schedule. Staff has posted the Load and Generation, as well as the renewable survey for stakeholders to review. He reminded the group of the deadlines for feedback and the anticipated approval dates. Upcoming milestones are the resource plan and the economic model development. With more focus on deadlines, the group discussed the efficiency of the current tools utilized by SPP and requested Staff to investigate software optionality for future ITP studies. The group also asked about the coordination of the Wind Integration Study currently being performed by SPP Operations Staff and the ITP process. There was concern expressed about potential differences in the results coming out of the WIS and what might be proposed through the ITP process. (Attachment 8 – 2017 ITP10 Schedule)

ACTION ITEM: Staff to look into optional software tools for use in ITP studies.

Agenda Item 5 – Transmission Planning Improvement Task Force (TPITF) Update

Alan Myers (ITC Great Plains) gave an update to the ESWG. The MOPC approved the TPITF charter, the main focus of this task force will be policy level decisions. The group would like to keep the TPITF as a standing update.

Agenda Item 6 – SPP-MISO CSP Regional Review Process

Brett Hooton (SPP Staff) explained that the purpose of the regional review study is to have a regional evaluation of the recommended interregional projects from the SPP-MISO Coordinated System Planning (CSP) Study. Projects must have an SPP B/C ratio of at least 1.0, based on a selection of ITP10 benefit metrics. Brett presented the potential interregional projects to be reviewed. The group discussed that if a project from the CSP replaces an ITP10 project, it must be evaluated by the same benefit metrics as the ITP project. Brett informed the group that the model has been posted and stakeholders have until June 10th to submit comments. Members requested that Staff update the Regional Review model with data submitted through the 2017 ITP10 Generation and Load Review. A draft scope will be posted on May 27th, soliciting feedback through June 4th. (Attachment 9 – SPP-MISO CSP Regional Review Process)

Agenda Item 7 – ESWG Charter Review

Kelsey Allen (SPP Staff) summarized the proposed change to the charter. The change increases the membership limit from 14 members to 18. Increasing each of the voting categories by one member. There will be 17 voting members and one non-voting regulatory liaison member. (Attachment 10 – ESWG Draft Charter)

> **Paul Dietz (Westar) made a motion; seconded by Leon Howell (OGE) to adopt the changes to the representation and voting structure section of the ESWG charter. The motion was approved unanimously.**

Agenda Item 8 – 2017 ITP10 Load and Generation Review Update

Kelsey Allen (SPP Staff) gave an update to the group on the status of the load and generation review. He asked for feedback or any questions of the current process. He reminded everyone that changes to the economic model are due back to staff by June 2nd.**Agenda Item 9 – 2017 ITP10 Scope**

Agenda Item 9a – Data Inputs and Methodology

Kelsey Allen (SPP Staff) presented to the group the current assumptions for the 2017 ITP10 study and the decision points that need to be addressed. The discussion began with prototypes, the group could not reach a decision on how to utilize the two data sources, EIA and Lazard. The ESWG asked staff to research and come back with a proposal. Discussion then moved onto the zonal reserve margin; the Capacity Margin Task Force (CMTF) is in the process of re-evaluating the SPP reserve margin, but the ITP process waiting on their decision would present a timing issue. Pat McCool (KCPL), as a member of the CMTF, felt that the 2017 ITP10 should utilize current approved criteria.

> **Pat McCool (KCPL) made a motion; seconded by Kip Fox (AEP-Transource) to maintain the reserve margin at 13.6% for the 2017 ITP10 study. The motion was approved unanimously.**

The ESWG revisited the renewable accreditation used in the most recent ITP study. The Generation Working Group (GWG) recently approved criteria to increase the capacity accreditation for both wind and solar. The group felt comfortable with the decisions made by the GWG.

Kip Fox (AEP-Transource) made a motion; seconded by Paul Dietz (Westar) to use actual wind accreditation values for wind farms with 3 years of historical data, and to follow SPP criteria, for wind farms with less than 3 years of historical data. The motion was approved unanimously.

Leon Howell (OGE) made a motion; seconded by Paul Dietz (Westar) to follow SPP criteria for accreditation of solar resources. The motion was approved unanimously.

In the 2017 ITP10, the 2005 NREL wind profile data was used to determine existing wind capacity factors, with a 15% increase being applied to new wind farms. Kelsey Allen (SPP) informed the group that there is a newer NREL dataset available that could be utilized. The group directed staff to gather more information and compare the 2012 NREL data to the currently used 2005 data.

When the conversation moved on to system topology, the consensus among the group was to use the 2025 ITP powerflow model developed in preparation for the 2016 ITPNT, with any necessary modifications. DC tie modeling was briefly discussed and Staff was directed to continue modeling the status quo of utilizing historical tie flows capped at long-term firm transmission service amounts.

Modeling parameters for the 2015 ITP10 utilized the Ventyx reference case for coal, oil, uranium, and emissions prices. NYMEX futures and DOE growth rates were used for natural gas prices. Wind was modeled with a cost $8/MWhr for variable O&M and curtailment. The group was comfortable moving forward with these assumptions. (Attachment 11 – 2017 ITP10 Data Inputs and Study Methodology)

Kip Fox (AEP-Transource) made a motion; seconded by Kurt Stradley (LES) to utilize the status quo methodology for modeling of fuel, wind, and emissions prices. The motion was approved unanimously.

Agenda Item 9b – Futures Assumptions

Kelsey Allen (SPP Staff) recapped the three futures approved by the board and began discussion that focused on how data inputs would be impacted in a CPP future. Discussion began with must run units and other unit operation. The group touched on a process to fairly evaluate operating directives against transmission solutions, operating minimums for based load units under the CPP futures, and other unit parameters.

Leon Howell (OGE) made a motion; seconded by Paul Dietz (Westar) to remove the must run flag for all base load units, except nuclear, for all three futures. Bary Warren (Empire) took exception to the motion because neither Empire nor SPP can control the operation of units outside the SPP BA, such as Plum Point. Paul Dietz (Westar) supported this concern. The motion was approved unanimously.

The group discussed the EPA goal calculation and timeline and came to the agreement to plan for the 2030 goal in the 2025 study year. Kelsey then presented a few different emissions limiting options to consider in order to reach emissions goals in the CPP futures. The discussion covered energy efficiency as a tool and the implications that may have on current load forecasts as well as leveraging unit retirements on an age, size, or technology basis. The ESWG directed staff to do more research and bring options and recommendations back to the group. (Attachment 12 – 2017 ITP10 Futures Assumptions)

Agenda Item 10 – Resource Expansion Methodology

Kelsey Allen (SPP Staff) gave a presentation on the resource expansion methodology. He offered potential solutions to improve the current methodology for inclusion of resources in the 2017 ITP10 study. The goal of the resource inclusion methodology is to better project the future mix of resources expected by the membership as well as to put bounds around the resources that can be included in the base models prior to the resource planning effort. The ESWG asked staff to refine the guidelines for these processes and bring them to the next face to face meeting. (Attachment 13 – ITP Resource Expansion Methodology)

Agenda Item 11 – ITP Resource Siting Methodology

Chris Jamieson (SPP Staff) updated the group on the development of an SPP independent siting process. Chris gave a high level overview of the research Staff has completed which included general concepts that could be leveraged and employed as well as the siting processes of other RTOs. Staff's intent with the independent siting methodology is both to develop a regional process that attempts to mimic the siting methodologies of individual stakeholders as well as minimize the generator outlet facilities needed to interconnect the future resources. The ESWG directed staff to continue researching and come back with a recommendation. (Attachment 14 – ITP Resource Siting Methodology)

ACTION ITEM: Staff to continue reviewing the resource siting methodology with utilities and to develop a recommendation for the 2017 TIP10.

Closing Items

Chair Alan Myers (ITC Great Plains) requested other items meriting discussion.

List of action items from the meeting:

1. Staff to look into optional software tools for use in ITP studies.
2. Staff to continue reviewing the resource siting methodology with utilities and to develop a recommendation for the 2017 TIP10.

The meeting was adjourned at 11:59 AM.

Respectfully Submitted,

Kelsey Allen
ESWG Secretary

Southwest Power Pool

Southwest Power Pool, Inc.

ECONOMIC STUDIES WORKING GROUP

May 20-21, 2015

Sheraton Downtown/Oklahoma City, OK

• ATTENDANCE LIST •

May 20th

Name	Company
Pat Hayes	Ameren
Bethany King	Empire District
Pat McCool	KCP&L
Wayman Smith	AEP
Brett Hooton	SPP
JASON CHAPLIN	OCC
Walt Cecil	MoPSC
Tim Owens	NPPD
KURT STRADLEY	LES
Jody Holland	Gridliance South Central MCN
Alan Myers	ITC
JORDAN SCHMICK	XCEL ENERGY
Jason Schmidt	Xcel Energy
Kip Fox	AEP Transource
Leon Howell	OG&E
Natasha Henderson	GSEC
Paul Dietz	Westar Energy
Michael Watt	OMPA
Michael Wegner	ITC
Chris Jamieson	SPP

Southwest Power Pool

Southwest Power Pool, Inc.

ECONOMIC STUDIES WORKING GROUP

May 20-21, 2015

Sheraton Downtown/Oklahoma City, OK

• ATTENDANCE LIST •

May 20th

Name	Company
Kelsey Allen	SPP
Tim Soles	OXY

Southwest Power Pool

Southwest Power Pool, Inc.
ECONOMIC STUDIES WORKING GROUP
May 20-21, 2015
Sheraton Downtown/Oklahoma City, OK

• ATTENDANCE LIST •

May 21st

Name	Company
Don Le	Nextera Energy Trans.
Kelsey Allen	SPP
Juliano Freitas	SPP
Jody Holland	Gridliance South Central / MCN
Tim Soles	OCCIDENTAL
Kurt Stradley	LES
Tim Owens	NPPD
Walt Cecil	MoPSC
Jason Chaplin	OCC
Pat McCool	KCPL
Wayman Smith	AEP
Bethany King	Empire
Pat Hayes	Ameren
Michael Wegner	ITC
Chris Jamieson	SPP
Paul Dietz	Westar Energy
Natasha Henderson	GSEC
Kip Fox	AEP-TRANSOURCE

SPP Southwest Power Pool

Southwest Power Pool, Inc.

ECONOMIC STUDIES WORKING GROUP

May 20-21, 2015

Sheraton Downtown/Oklahoma City, OK

• ATTENDANCE LIST •

May 21st

Name	Company
Leon Howell	OG&E
Jason Schmidt	Xcel Energy
Jordan Schmick	XCEL ENERGY
Lauren Quillian	Xcel Energy

Name	Attendance	Company
Pat Hayes	In Person	Ameren
Bathany King	In Person	Empire District
Pat McCool	In Person	KCP&L
Wayman Smith	In Person	AEP
Brett Hooton	In Person	SPP
Jason Chaplin	In Person	OCC
Walt Cecil	In Person	MOPSC
Tim Owens	In Person	NPPD
Kurt Stradley	In Person	LES
Jody Holland	In Person	Gridliance South Central MCN
Alan Myers	In Person	ITC Great Plains
Jordan Schmick	In Person	Xcel Energy
Jason Schmidt	In Person	Xcel Energy
Kip Fox	In Person	AEP - Transource
Leon Howell	In Person	OG&E
Natasha Henderson	In Person	GSEC
Paul Dietz	In Person	Westar Energy
Michael Watt	In Person	OMPA
Michael Wegner	In Person	ITC Great Plains
Chris Jamieson	In Person	SPP
Kelsey Allen	In Person	SPP
Juliano Freitas	In Person	SPP
Tim Soles	In Person	OXY
Don Le	In Person	Nextera Energy Trans
Lauren Quillian	In Person	Xcel Energy
Kirk Hall	In Person	SPP
Adam Bell	Webex	
agreb	Webex	
Al Tamimi	Webex	
Bary Warren	Webex	
Beverly Baughman	Webex	
Bill Leung (NPRB)	Webex	
Blaine Erhardt	Webex	
Brian Buffington	Webex	
Bruce Cude (SPS)	Webex	
Cary Frizzell (SPP)	Webex	
Chris Giles	Webex	
Clayton Mayfield	Webex	
David Kelley (SPP)	Webex	
ed pfeiffer (quanta)	Webex	
Evan Estes	Webex	
Gayle Freier	Webex	
Heather Starnes (MJMEUC/CU)	Webex	
Jason Chaplin (OCC)	Webex	
Jason Schmidt (Xcel)	Webex	
Jeff Knottek	Webex	

Jeremy Harris (WERE)	Webex
Jeremy Severson (BEPC)	Webex
John Bell (KCC)	Webex
Jon Iverson	Webex
Jon Shipman (OPPD)	Webex
Josh Ross	Webex
Kaustubh Deshmukh	Webex
Liz Gephardt (SPP)	Webex
Lori Frisk-Thompson	Webex
Natasha	Webex
Nikki Roberts	Webex
Noumvi Ghomsi	Webex
Paul Malone	Webex
Robert Stillwell	Webex
Rosemary Mittal	Webex
sam loudenslager (SPP)	Webex
Sarah Pettus	Webex
Shawnee Claiborn-Pinto	Webex
Steve Gaw	Webex
Todd Tadych (DATC)	Webex
Zac Hager	Webex

1. Bennie Weeks proxy to Jason Schmidt

From: Weeks, Bennie F [mailto:Bennie.Weeks@XCELENERGY.COM]
Sent: Monday, May 18, 2015 7:23 PM
To: Kelsey Allen
Cc: Schmidt, Jason E
Subject: Re: ESWG 5/20-21/15 Additional Background Materials

Kelsey,
I'm giving my proxy to Jason Schmidt for the May 20-21 ESWG meeting.

Bennie Weeks

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

May 20th – 21st, 2015

Sheraton Downtown, Oklahoma City, OK

• A G E N D A •

Wednesday 1:00pm – 5:00pm

1. Administrative items
   a. Call to Order, Introductions...Alan Myers (5 minutes)
   b. Receipt of Proxies ....Kelsey Allen (1 minute)
   c. Review of Agenda[1] ....Alan Myers (1 minute)
2. Review of Past Action Items[1] ....Kelsey Allen (5 minutes)
3. Consent Agenda (Approval Item)[1]...Alan Myers (5 minutes)
   a. Approval of Meetings Minutes – March 31st - April 1st, 2015
   b. Approval of Meetings Minutes – May 1st, 2015
4. Study Schedules[1] .... Juliano Freitas (25 minutes)
   a. SPP-MISO CSP & Regional Review
   b. 2017 ITP10
5. Transmission Planning Improvement Task Force (TPITF) Update..................Alan Myers (10 minutes)
6. ESWG Charter Review[1]... Kelsey Allen (30 minutes)
7. SPP-MISO CSP Regional Review Process[1] ....Brett Hooton (60 minutes)
8. 2017 ITP10 Load and Generation Review Update.. Kelsey Allen (30 minutes)
9. 2017 ITP10 Scope[1]... SPP Staff (75 minutes)
   a. Data Inputs and Methodology
   b. Futures Assumptions

Thursday 8:00am – 12:00pm

9. 2017 ITP10 Scope Continued .... SPP Staff (105 minutes)
10. ITP Resource Expansion Methodology[1]...Kelsey Allen (30 minutes)

[1] Background Material Included

11. ITP Resource Siting Methodology... Chris Jamieson (60 minutes)

12. NTC Re-Evaluation Process Overview... Cary Frizzell (30 minutes)

13. Closing Items.. All (5 minutes)

    a. Summary of Action Items (Kelsey Allen)

    b. Future Meetings

        i. June 18th, 2015: 8th Floor AEP Offices, Dallas, TX

        ii. July 9th, 2015: 8th Floor AEP Offices, Dallas, TX

        iii. August 19th-20th, 2015: Magnolia Hotel, Denver, CO

[1] Background Material Included

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

Pending Action Items Status Report

May 20th – 21st, 2015

ID	Action Item	Date Originated	Status	Comments
057	SPP staff will write a straw-man procedure or portion of the ITP manual that deals with conventional and wind generation planning and siting within the ITP process. The process should be in place by the Spring of 2015.	August 23, 2012	In Progress Staff	A draft straw man will be provided to the group at the end of April for review.
076	ESWG will analyze the aggregate studies impact on the 2015 ITP10 study for transmission service request.	May 16, 2013	~~In Progress~~Complete ESWG Members	Item on hold, wait for Aggregate Studies new results. Document in the Scope how we intend to incorporate projects issued NTC after approved ITP powerflow models.
127	SPP Staff will develop a process to address interaction between SPP departments (Generation Interconnection, Aggregate Studies, Economic Planning, Steady State and Modeling) to detect basic errors in our models.	August 7, 2014	In Progress Staff	
128	SPP Staff will explain to ESWG Members the process to submit data to model on demand.	August 7, 2014	In Progress Staff	
142	Staff will work with Ventyx to determine a schedule and details for a PROMOD User's Group meeting to be hosted by SPP.	January 29th, 2015	In Progress Staff	
147	ESWG to re-evaluate the modeling issues related to load pockets and wind in the RCAR II.	March 31st, 2015	In Progress ESWG	
148	Staff to develop a formal member review procedure for review of data and results related to economic studies.	March 31st, 2015	In Progress Staff	
149	ESWG to discuss how staff will request generation and load data in future studies.	May 1st, 2015	In Progress ESWG	
150	ESWG to develop criteria for including non-firm generation in the ITP 10 and 20 models, within 60 days.	May 1st, 2015	In Progress ESWG	

151		Staff to look into optional software tools for use in ITP studies	May 20th, 2015	In Progress Staff	
152		Continue review resource siting methodology with utilities and develop a recommendation for the 2017 ITP10	May 20th, 2015	In Progress Staff	

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

March 31st – April 1st, 2015

AEP Offices 8th Floor, Dallas, TX

• SUMMARY OF ACTIONS TAKEN •

1. Approved the January 29th, February 11th, and February 18th, 2015 meeting minutes.
2. Approved to present 4 Futures to the MOPC showing that Future 1 – Future 3 (Regional 111D, State 111D, no 111D) are higher priority as recommended by ESWG with optionality for Future 4 (worst case), but not recommended. Also to consider the low load growth and low gas supply drivers from Future 4 as sensitivities in Future 3, as well as other drivers that may be identified during further evaluation

Southwest Power Pool

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

March 31st – April 1st, 2015

AEP Offices 8th Floor, Dallas, TX

• MINUTES •

Agenda Item 1 – Administrative Items

Agenda Item 1a - Call to Order, Introductions

Chair Alan Myers (ITC Great Plains) called the meeting of the Economic Studies Working Group (ESWG) to order at 1:00 PM, welcomed those in attendance, and asked for introductions.

There were 22 in-person participants and 44 web conference participants representing 11 of 13 ESWG members. (Attachment 1 – March 31st – April 1st, 2015 Attendance List)

Agenda Item 1b – Receipt of Proxies

Alan Myers (ITC Great Plains) asked for any proxy statements. Two proxies were identified; Bruce Walkup (AECC) named Michael Massery (AECC) as his proxy. Don Le (NextEra Energy) named Brian Gedrich (NextEra Energy) as his proxy. (Attachment 2 – Proxy Statements)

Agenda Item 1c – Review of Agenda

Chair Alan Myers (ITC Great Plains) presented the agenda for review and asked for any additions or corrections. (Attachment 3 – March 31st – April 1st, 2015 Agenda)

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

Agenda Item 2 – Review of Past Action Items

Kelsey Allen (SPP Staff) reviewed the list of past action items. A number of the items will be discussed in today's meeting. (Attachment 4 – Past Action Items)

Agenda Item 3 – Consent Agenda

The Consent Agenda included the following item:

Approval of Meetings Minutes – January 29th, 2015 (Attachment 5 – ESWG 01.29.15 Minutes)
Approval of Meetings Minutes – February 11th, 2015 (Attachment 6 – ESWG 02.11.15 Minutes)
Approval of Meetings Minutes – February 18th, 2015 (Attachment 7 – ESWG 02.18.15 Minutes)

> **The consent agenda was approved unanimously.**

Agenda Item 4 – Study Schedules

Agenda Item 4a – SPP-MISO CSP

Juliano Freitas (SPP Staff) gave an update on the status of the SPP-MISO CSP Study. SPP and MISO Staff are currently retesting transmission solutions due to a model issue in preparation for the next stakeholder meeting in May. The joint portion of the study is expected to conclude in July when the Regional Review Process will begin. The default model for this analysis is the latest ITP10, which is currently the 2015 ITP10. There was some concern about the vintage of the model and discussion on the possibility of making updates to the data. (Attachment 8 - SPP-MISO CSP Schedule)

Agenda Item 4b – 2017 ITP10

Juliano Freitas (SPP Staff) gave an update on the status of the 2017 ITP10 Study. The milestones currently in progress are the load and generation review, data for which is being reviewed MDWG contacts. The economic portion of these milestones will be sent out to the ESWG contacts in April. The next milestone will be the renewable survey in late May. Kip Fox (AEP-Transource) suggested that the survey be pulled in sooner for better timing as some utilities are currently working on their Integrated Resource Plans (IRP).

There was some discussion about the approval of individual milestones. Some members felt it would be more efficient to simply approve the final model and all of the data incorporated rather than individual approvals of the different datasets. This issue will be discussed in an upcoming meeting.

Members requested flexibility in the schedule in order to be able to adjust to the EPA CPP ruling to come out this summer. (Attachment 9 – 2017 ITP10 Schedule)

Agenda Item 4c – RCAR II

Juliano Freitas (SPP Staff) gave an update on the status of the RCAR II Study. The RARTF met March 13th and approved a delay in final completion of the RCAR II analysis until July, 2016 due to stakeholder concern about the models. Included in the motion was direction to utilize the 2017 ITP10 model, currently scheduled to be complete by January 2016. There was also a charge for SPP Staff to develop more expertise in the calculation of benefit metrics in order to be able to perform the metrics without consultant assistance.

The RARTF also requested the ESWG re-evaluate the modeling challenges inherent in the RCAR analysis related to the wind generation and load pocket issues discussed in the February 11th meeting.

ACTION ITEM: ESWG to re-evaluate the modeling issues related to load pockets and wind in the RCAR II.

Agenda Item 5 – 2015 ITP10 Schedule Assessment

Juliano Freitas (SPP Staff) gave a presentation on the planned vs. actual timeline and Staff hours of the 2015 ITP10 study. He stressed the importance of meeting scheduled completion dates due to the adverse impacts not doing so can have, including the shortening of member review time later in the process. (Attachment 10 – 2015 ITP10 Schedule Assessment)

Agenda Item 6 – ITP Resource Expansion Methodology

Liz Gephardt (SPP Staff) presented the issues with current wind expansion rules and potential solutions to improve the current methodology for inclusion of resources in ITP studies as a whole. There was much discussion on the different categories and "buckets" each of the resources will be included, as well as the implication each one of the designations would have on the process. Staff is still working through the details of some of these more general suggestions and will continue to refine for discussion at a future meeting. (Attachment 11 – ITP Resource Expansion Methodology)

Agenda Item 7 – SPP Resource Siting Methodology

Chris Jamieson (SPP Staff) gave an update on the current status of the siting strawman related to action item 057. The discussion was focused on high level concepts for resource siting and covered current processes of SPP and other RTOs. Kip Fox (AEP-Transource) suggested that Staff speak with different utilities in order to determine common practices that could be utilized for an SPP regional methodology.

The goal is to release a draft strawman at the end of the month in order for members to review and prepare for discussion at the May meeting. The siting milestone for the 2017 ITP10 is scheduled to begin early stages in September. Alan Myers (ITC Great Plains) noted that collaboration with the TWG should occur during the development process. (Attachment 12 – SPP Resource Siting Methodology)

Agenda Item 8 – 2017 ITP10 Futures

The group continued discussion on the current list and details of the proposed futures for the 2017 ITP10. Some of the drivers were discussed again but most of the conversation focused on what and how to summarize the progress and develop a recommendation for the MOPC. A straw poll was taken to gauge the general stakeholder confidence in each of the proposed futures. Future 1, 2, and 3 were closely ranked the highest (in that order), with Future 4 ranked the lowest by far. Future 4 (worst case) is and extreme regulation case where we would see a wholesale conversion to gas and renewables, with older small to medium coal generation (500 MW and 40 years) being retired, as well as increased focus on energy efficiency. The majority of the group saw the state solution to 111D and no 111D implementation as the bookends in terms of impact to the transmission system. Some thought that a future with some sort of compliance would be more likely than no compliance at all.

The stakeholders agreed that all 4 proposed futures should be discussed at the April MOPC meeting. Kip Fox (AEP-Transource) made a motion; seconded by Brian Gedrich (NextEra Energy Transmission) to present 4 Futures to the MOPC showing that Future 1 – Future 3 (Regional 111D, State 111D, no 111D) are higher priority as recommended by ESWG with optionality for Future 4 (worst case), but not recommended. During discussion, there was concern regarding the drivers that might be lost if Future 4 was not considered moving forward, namely the low load growth and low gas supply drivers. A friendly amendment to the motion was made.

> **Kip Fox (AEP-Transource) made a motion; seconded by Brian Gedrich (NextEra Energy Transmission) to present 4 Futures to the MOPC showing that Future 1 – Future 3 (Regional 111D, State 111D, no 111D) are higher priority as recommended by ESWG with optionality for Future 4 (worst case), but not recommended. Also to consider the low load growth and low gas supply drivers from Future 4 as sensitivities in Future 3, as well as other drivers that may be identified during further evaluation. The motion passed unanimously.**

Discussion continued on more detailed aspects of possible implementation of 111D driven futures. Staff informed the group of some of the methodologies used in SPP's CPP Compliance Study. Discussion on this topic will continue in future meeting. (Attachment 13 – 2017 ITP10 Futures Discussion)

<u>Agenda Item 9 – Economic Data Review Procedures</u>

Bary Warren (Empire District) began a discussion on the timing and review periods for the economic model within each study performed by SPP, as well as the process for reviewing results following study analysis. It was requested that Staff develop member review procedures to document what, how, and when data is transmitted to the members for review. Staff and other members agreed that a more formal process should be developed in order to limit the issues associated with new members or utility staff turnover and the ability to efficiently get involved in the SPP economic planning processes.

ACTION ITEM: Staff to develop a formal member review procedure for review of data and results related to economic studies.

<u>Agenda Item 10 – 2017 ITP10 Generation and Load Review</u>

Kelsey Allen (SPP Staff) gave an update on the current review of generation and load data in the economic models. The MDWG contacts are in their second round of review of the items related to powerflow information. Staff is currently working on gathering the economic parameters of generators in PROMOD and will be sending out the data to the ESWG contacts for review. The review of load data (demand group annual peak, energy, and losses) will not be sent out until the end of April until the ITP powerflow models currently being developed by the SPP Modeling Staff are further underway. Staff asked the members about the utilization of the Ventyx nodal data from the reference case produced by Ventyx staff for parameters within SPP. Historically Staff has only updated data outside SPP with this data and has some concern that there are parameters that should be updated consistently across the entire model.

Members had some general questions about defining the PROMOD data and how it should be submitted. Staff will include these details in the data review. Kip Fox (AEP-Transource) made a motion; seconded by Kurt Stradley (LES) for SPP Staff to start from the Ventyx reference case for certain parameters and ask for members to make updates during each ITP cycle. There was concern about reviewing parameters that will only be overwritten with Ventyx data later in the process. After discussion the motion was withdrawn. Staff requested that the parameters listed in the presentation be sent out for member review while a more detailed proposal for leveraging the Ventyx data is put together. The members agreed, with the understanding that the member reviewed data would not be overwritten. (Attachment 14 – 2017 ITP10 Generation & Load Review)

Agenda Item 11 – 2017 ITP10 Study Methodology

Kelsey Allen (SPP Staff) presented on the study methodology for the 2017 ITP10. This will be a recurring presentation where staff will bring detailed items related to modeling and methodology decisions for discussion. The discussion for this meeting was focused on the source and methodology for updating the hourly profiles for wind and load to be used in the 2017 ITP10. Kelsey reviewed the source and details of the wind and load profiles developed and used for the 2014 Probabilistic Assessment study, which included leveraging an average of historical operations and NREL data. Staff recommended utilizing the data and process approved for the ProbA with the exception of the granularity of the load profiles and the utilization of operations data for wind profiles. Staff suggested more load granularity and all wind profiles be based on NREL profiles to minimize the impact of operational wind curtailment. There was much discussion on the process of averaging multiple years to develop a single profile, especially for load data. There was concern that the smoothing out of the load profiles would mute the peaks and valleys of a typical year, resulting in an understatement of the issues caused by load. There were some suggestions made by the members for other options, but many were time consuming alternatives. There was a general consensus on using Staff's recommendation for the wind profile methodology but more discussion is needed on the load profile approach. (Attachment 15 – 2017 ITP10 Study Methodology)

Agenda Item 11 – 2015 ESWG Meeting Schedule

Kelsey Allen (SPP Staff) reviewed the proposed meeting schedule for the 2nd semester of 2015. Some dates were adjusted slightly due to conference room availability. No changes were suggested. All dates are confirmed with the exception of the October meeting. Staff will need to work with NextEra staff to confirm availability. (Attachment 16 – 2015 ESWG Meeting Schedule)

Closing Items

Chair Alan Myers (ITC Great Plains) requested other items meriting discussion.

List of action items from the meeting:

1. ESWG to re-evaluate the modeling issues related to load pockets and wind in the RCAR II.
2. Staff to develop a formal member review procedure for review of data and results related to economic studies.

The meeting was adjourned at 11:49 AM.

Respectfully Submitted,

Kelsey Allen
ESWG Secretary

Southwest Power Pool

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

May 1st, 2015

Net Conference

• SUMMARY OF ACTIONS TAKEN •

1. Approved a motion to develop a waiver process for the ITP10 and 20 to replace the current process in addressing generation that has no GIA or TSR as identified by SPP Staff, with detailed criteria to be developed no later than 60 days from now.
2. Approved a motion that for the sake of modeling brevity and with the exception of the HPILS loads, accept staff's recommendation that the ESWG approve the status quo hourly load profiles for the 2017 ITP10.

Southwest Power Pool

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

May 1st, 2015

Net Conference

• MINUTES •

<u>Agenda Item 1 – Administrative Items</u>

<u>Agenda Item 1a - Call to Order, Introductions</u>

Chair Alan Myers (ITC Great Plains) called the meeting of the Economic Studies Working Group (ESWG) to order at 8:00 AM, welcomed those in attendance, and asked for introductions.

There were 46 web conference participants representing 10 of 13 ESWG members. (Attachment 1 – May 1st, 2015 Attendance List)

<u>Agenda Item 1b – Receipt of Proxies</u>

Alan Myers (ITC Great Plains) asked for any proxy statements. No proxies were identified.

<u>Agenda Item 1c – Review of Agenda</u>

Chair Alan Myers (ITC Great Plains) presented the agenda for review and asked for any additions or corrections. (Attachment 2 – May 1st, 2015 Agenda)

> **Paul Dietz (Westar) made a motion; seconded by Tim Owens (NPPD) to adopt the agenda. The motion was approved unanimously.**

<u>Agenda Item 2 – 2017 ITP10 Generation and Load Review Update</u>

Kelsey Allen (SPP Staff) gave an update on the status of the Generation and Load review. He informed members that the MDWG submittal period is complete and that staff is working to incorporate all changes. The Economic portion of the data submittal is still out for review, and feedback is due May 6th.

The ESWG would like a broader discussion of how data submittals are done going forward.

ACTION ITEM: ESWG to discuss how staff will request generation and load data in future studies.

<u>Agenda Item 3 – Siting Strawman Update</u>

Kelsey Allen (SPP Staff) gave an update to the group that Staff is working on proof of concept analysis and will be bringing this item back for discussion at the next face to face meeting in May.

<u>Agenda Item 4 – ITP Resource Expansion Methodology</u>

Liz Gephardt (SPP Staff) presented a recap of the changes planned for the renewable survey. There was discussion on replacing the “other” category in the survey, and making up the block of data through a waiver process for stakeholders to request generation to be included in the models and generation from the GI queue. The group discussed ways to fill the gap between what has made it into the model through the stricter near term criteria, and how to add in things that should be included in the 10 and 20 studies. Stakeholders agreed there should be a waiver process to address additional generation. Kip Fox (AEP-Transource) made a motion; seconded by Bennie Weeks (SPS) to develop a process for the ITP 10/20, to address generation that has no GIA or TSR as identified by SPP staff with detailed criteria to be developed no later than 60 - 90 days from now. During discussion, there was concern that this motion did not direct staff on the current process. The motion was withdrawn by Kip Fox (AEP-Transource). Kip Fox (AEP-Transource) made a new motion; seconded by Bennie Weeks (SPS) to develop a process for the ITP 10/20 to replace the current process in addressing generation that has no GIA or TSR as identified by SPP staff, with detailed criteria to be developed no later than 60 - 90 days from now. Additional discussion pointed out that if the criteria was not completed for 90 days it could impact the schedule. Tim

Owens (NPPD) made a friendly amendment to remove the 90 days, and limit it to 60 days. (Attachment 3 – ITP Resource Expansion Methodology)

Kip Fox (AEP-Transource) made a motion; seconded by Bennie Weeks (SPS) to develop a waiver process for the ITP10 and 20 to replace the current process in addressing generation that has no GIA or TSR as identified by SPP Staff, with detailed criteria to be developed no later than 60 days from now. The motion passed with one abstention, Alan Myers (ITC Great Plains). Alan Myers (ITC Great Plains) abstained from voting due to the following reason: it is my belief that the changes to renewable survey approved by ESWG represent a de facto policy change in how SPP plans for renewables which is not within ESWG's purview to make.

ACTION ITEM: ESWG to develop criteria for including non-firm generation in the ITP 10 and 20 models, within 60 days.

Agenda Item 5 – ITP Hourly Profiles

Kelsey Allen (SPP Staff) presented to the group, he went over the options for creating hourly profiles. Status Quo of using a single year hourly data, or changing the source of the data to member submittals, SPP operations data, or FERC form 714. Staff outlined the benefits and concerns with each option, and recommended continuing with the status quo. Kip Fox (AEP-Transource) made a motion to approve the status quo hourly profiles and staff recommendation. There was discussion among the group that this motion didn't directly address HPILS loads. Kip withdrew his motion. Paul Dietz (Westar) made a motion; seconded by Kip Fox (AEP-Transource) that for the sake of modeling brevity, with the exception of the HPILS loads, that the ESWG approve staff's recommendation to continue with status quo. (Attachment 4 – ITP Hourly Profiles)

Paul Dietz (Westar) made a motion; seconded by Kip Fox (AEP-Transource) that for the sake of modeling brevity and with the exception of the HPILS loads, accept staff's recommendation that the ESWG approve the status quo hourly load profiles for the 2017 ITP10. The motion passed unanimously.

Closing Items

Chair Alan Myers (ITC Great Plains) requested other items meriting discussion. Chair Alan Myers (ITC Great Plains) gave an update on the BOD meeting. The Board has directed the ESWG and Staff to use futures 1-3, and include normal load growth in the third future. The ESWG will be bringing the scope for MOPC approval in July.

List of action items from the meeting:

1. ESWG to discuss how staff will request generation and load data in future studies.
2. ESWG to develop criteria for including non-firm generation in the ITP 10 and 20 models, within 60 days.

The meeting was adjourned at 9:55 AM.

Respectfully Submitted,

Kelsey Allen
ESWG Secretary

SPP-MISO CSP & Regional Review Study

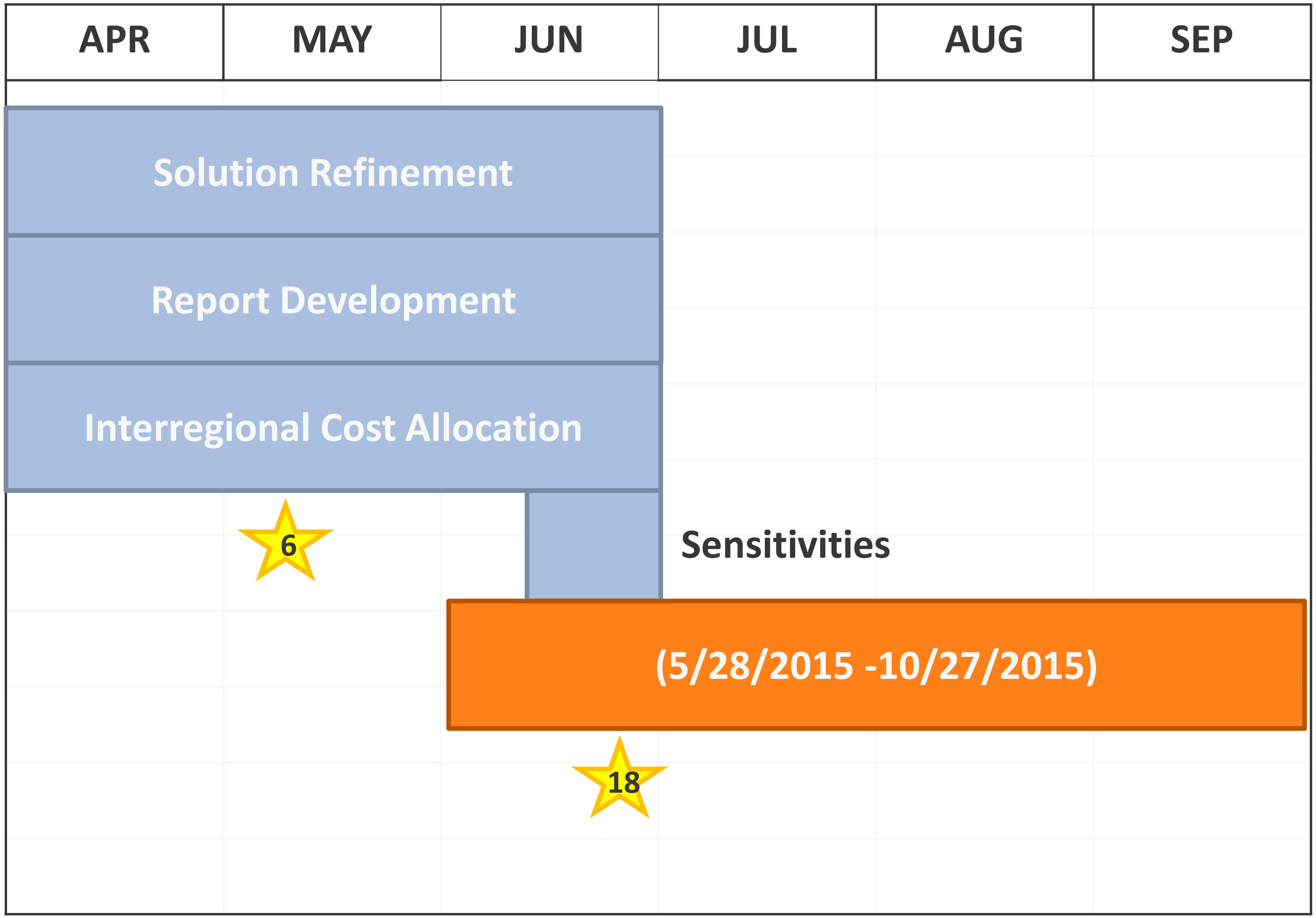
May 20th, 2015

ESWG

Juliano Freitas

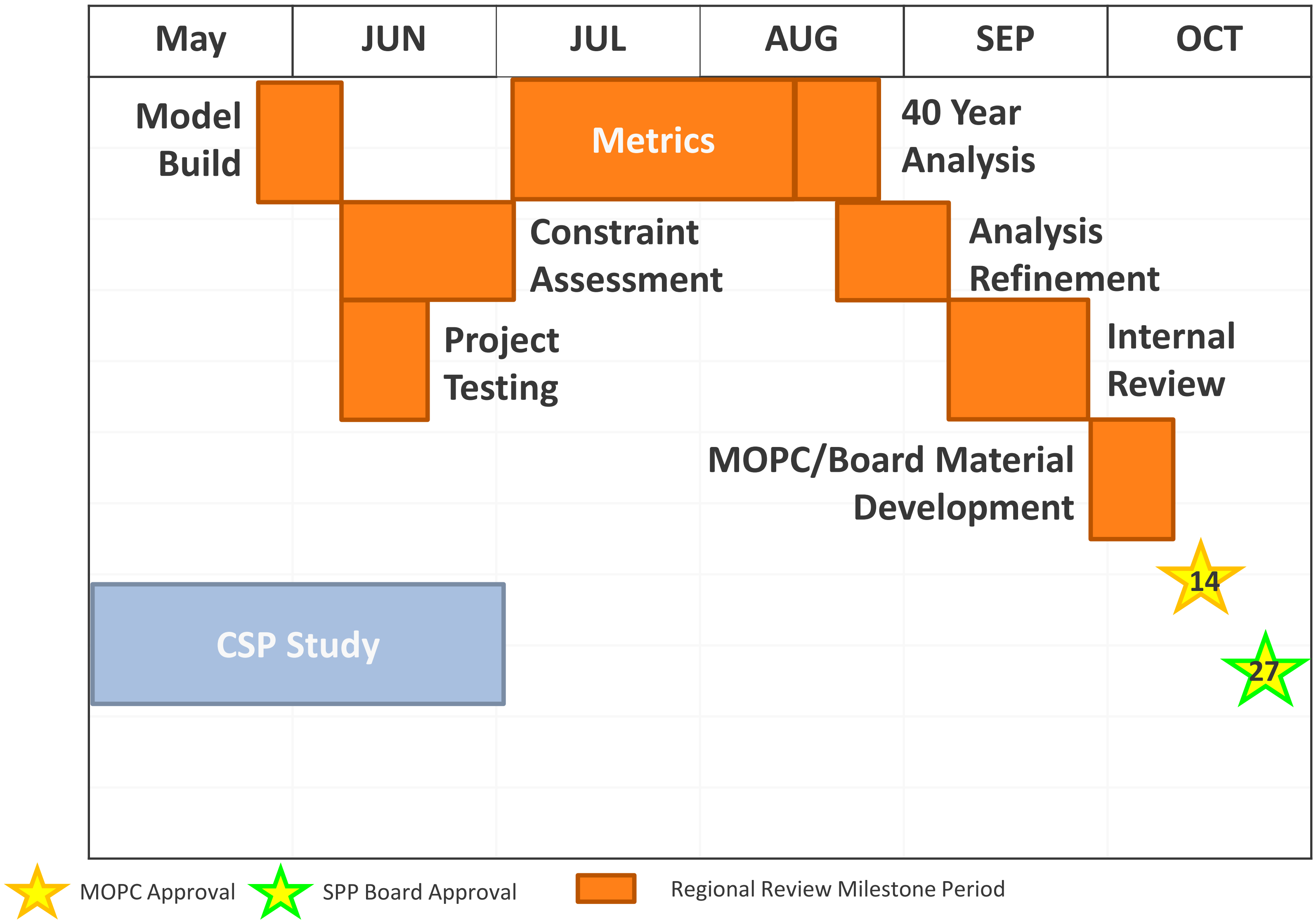
Southwest Power Pool

MISO SPP CSP Milestone Schedule (Apr-Sep 2015)



Stakeholder Meeting | CSP Milestone Period | Regional Review Milestone Period

Regional Review Milestone Schedule (May-Oct 2015)



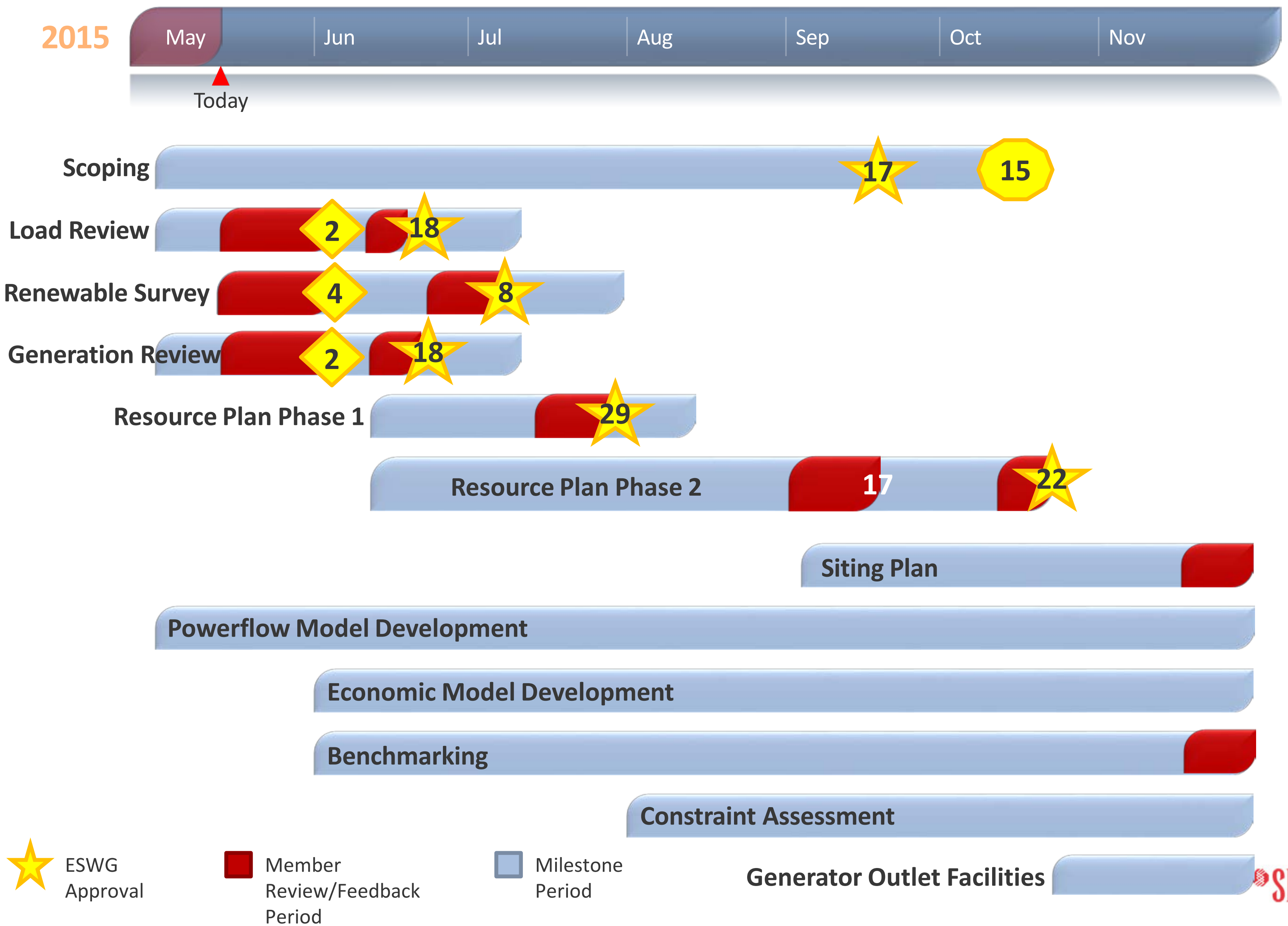
2017 ITP10 Schedule

May 30th, 2015

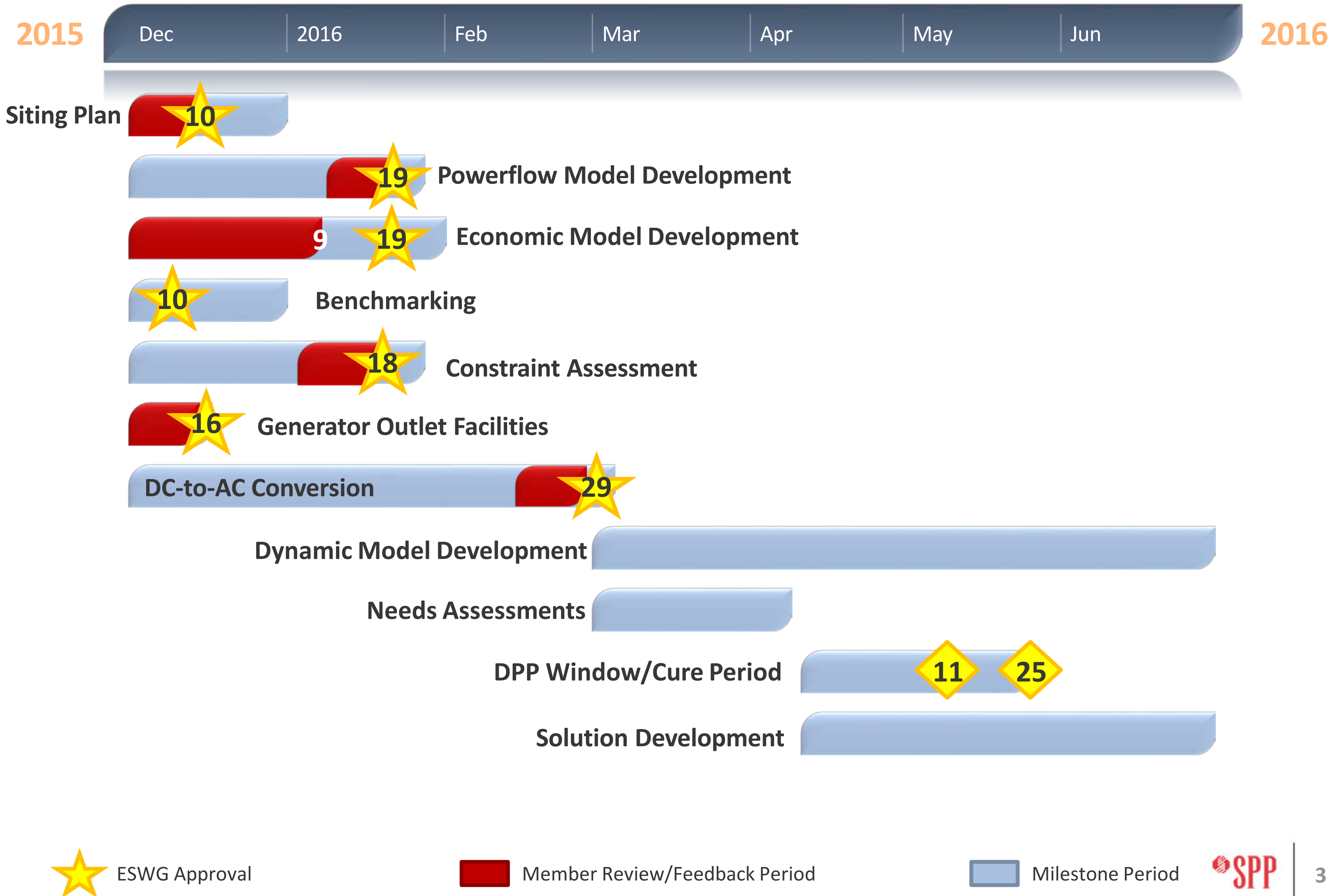
ESWG

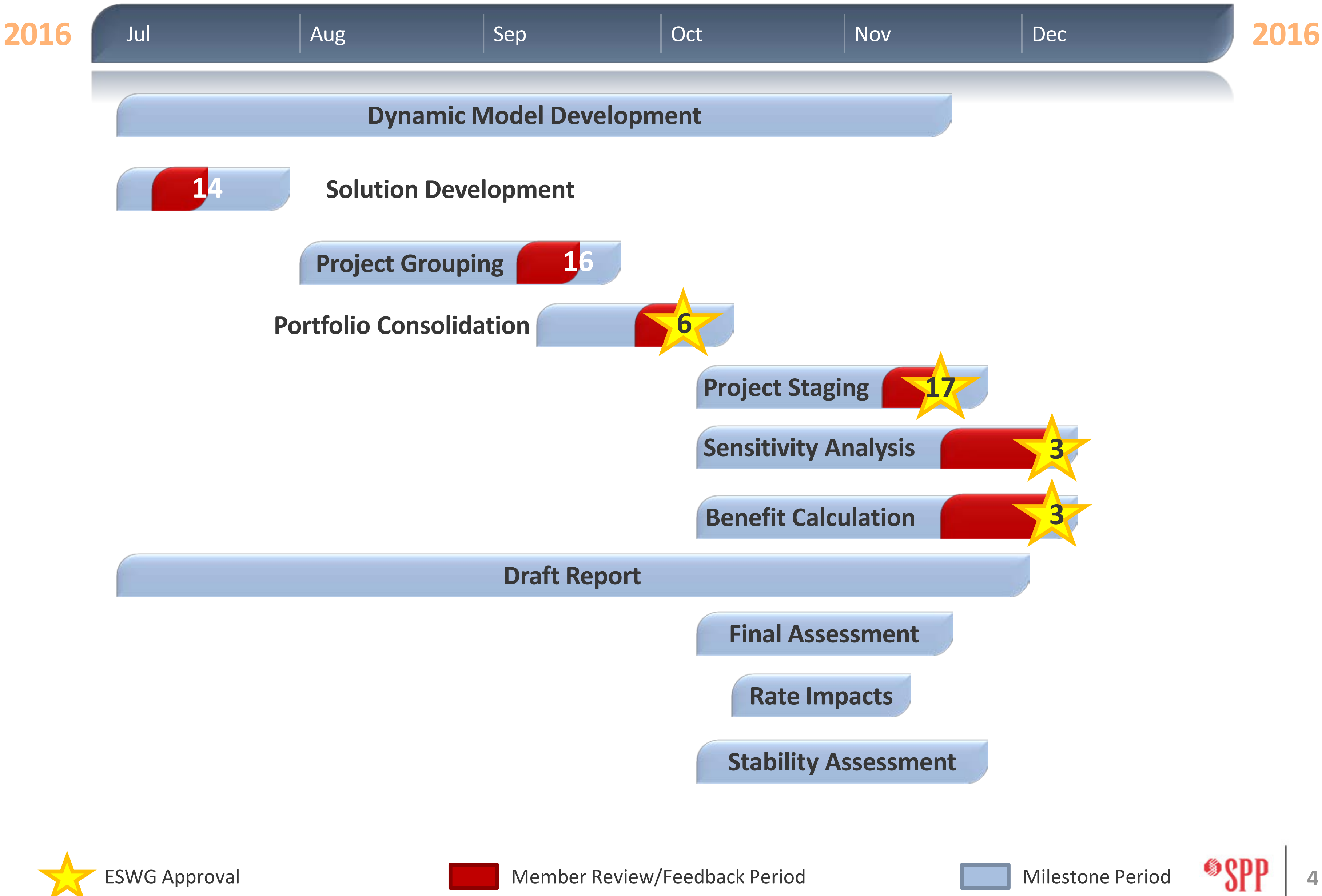
Juliano Freitas

SPP Southwest Power Pool



2015
May
Jun
Jul
Aug
Sep
Oct
Nov
2015
Today
Scoping
17
15
Load Review
2
18
Renewable Survey
4
8
Generation Review
2
18
Resource Plan Phase 1
29
Resource Plan Phase 2
17
22
Siting Plan
Powerflow Model Development
Economic Model Development
Benchmarking
Constraint Assessment
Generator Outlet Facilities
ESWG Approval
Member Review/Feedback Period
Milestone Period


2015
Dec
2016
Feb
Mar
Apr
May
Jun
2016
Siting Plan
10
19
Powerflow Model Development
9
19
Economic Model Development
10
Benchmarking
18
Constraint Assessment
16
Generator Outlet Facilities
DC-to-AC Conversion
29
Dynamic Model Development
Needs Assessments
DPP Window/Cure Period
11
25
Solution Development
ESWG Approval
Member Review/Feedback Period
Milestone Period


2016
Jul
Aug
Sep
Oct
Nov
Dec
2016
Dynamic Model Development
14
Solution Development
Project Grouping
16
Portfolio Consolidation
6
Project Staging
17
Sensitivity Analysis
3
Benefit Calculation
3
Draft Report
Final Assessment
Rate Impacts
Stability Assessment
ESWG Approval
Member Review/Feedback Period
Milestone Period

ITP10 Milestone Schedule - Summary

Task Name	Start	Finish	Review Period	Feedback Cutoff	ESWG Approval
Scoping	October ‘14	October ‘15	Multiple Reviews		9/17/15
Load Review	February	July	Thru 6/2/2015	6/2/2015	6/18/15
Renewable Survey	May	July	Thru 6/4/15	6/4/2015	7/8/15
Generation Review	February	July	Thru 6/2/2015	6/2/2015	6/18/15
Resource Plan Phase 1	June	August	7/14/15 - 7/28/15		7/29/15
Resource Plan Phase 2	June	October	9/3/15 - 9/17/15		10/22/15
Siting Plan	September	December	11/12/15 - 12/10/15		12/10/15
Powerflow Model Development	May ‘15	January ‘16	1/4/16 - 1/19/16		January '16
Economic Model Development	June ‘15	January ‘16	12/21/15 – 1/9/16		January '16
Benchmarking	June	December	11/12/15 - 12/2/15		12/10/15
Constraint Assessment (TWG)	August ‘15	January ‘16	1/4/15 - 1/18/15		January '16
Generator Outlet Facilities	October	December	12/1/15 - 12/15/15		12/16/15
DC-to-AC Conversion	October	March ‘16	2/17/15 - 2/26/15		February ’16
Needs Assessments	March ‘16	April ‘16			
DPP Window/Cure Period	April ‘16	May ‘16	4/11/16 - 5/11/16 5/12/16 - 5/25/16	5/11/2016	
Solution Development	April ‘16	July ‘16	7/7/16 - 7/14/16		
Project Grouping	August ‘16	September ’16	9/9/16 - 9/16/16		Sept '16
Portfolio Consolidation	September ‘16	October ’16	9/29/16 - 10/5/16		October '16
Project Staging	October ’16	November’16	11/9/16 - 11/16/16		November '16
Sensitivity Analysis	October ’16	December ’16	11/18/16 - 12/2/16		December '16
Benefit Calculation	October ’16	December ’16	11/18/16 - 12/2/16		December '16
Draft Report	July ‘16	December ‘16	Multiple Reviews		December '16

Note: Most review period dates are subject to change based on future WG meeting schedules and do not include normal meeting material review times (generally 1 week).

Regional Review

Brett Hooton

bhooton@spp.org

Southwest Power Pool

Presentation Overview

- Regional Review Process
- SPP-MISO Potential Interregional Projects
- 2015 SPP-MISO Regional Review
  - 2015 SPP-MISO CSP
  - Assumptions, Models, Evaluation
- Timeline and Next Steps

REGIONAL REVIEW PROCESS

Purpose

- Regional evaluation of a recommended interregional project
  - Projects recommended by the Joint Planning Committee (JPC) from the Coordinated System Plan (CSP) study by the Joint Planning Committee
  - Utilize previously vetted, member developed assumptions and analyses
  - Independent from MISO's Regional Review Process
- Stakeholder evaluation process
  - Verify benefits and costs of projects are appropriate for SPP
- Opportunity for SPP Board of Directors approval of projects

Governance

- SPP OATT Attachment O Section IV.6
  - Timeline based on the interregional procedures
  - Utilize the Regional Review Methodology
  - Develop a report outlining aspects of the study including the project benefits
  - Evaluation of reliability impacts
- Regional Review methodology
  - Approved by ESWG, TWG, and MOPC
  - Outlines the process and provides guidance on the scope of the regional review

Regional Review Methodology Paper

- Interregional project may be completely within one region
- Guidance on scope
  - Must include a list of assumptions, the applicable models used, the type of analyses to be performed, and an overview of the stakeholder process
  - Scope must be approved by ESWG (or TWG for reliability projects)
- SPP B/C ratio of at least 1.0
  - Cost allocation identified in the CSP
  - Benefits based on selection of ITP10 metrics

Regional Review Methodology Paper

- **Metrics**
  - Selection of metrics taken from approved ITP10 metrics
  - Not necessary to utilize all metrics
  - Minimum requirement to utilize APC
- **Analysis**
  - Sufficient to calculate the selected benefit metrics
  - Guidance from the ESWG and TWG as appropriate

Regional Review Methodology Paper

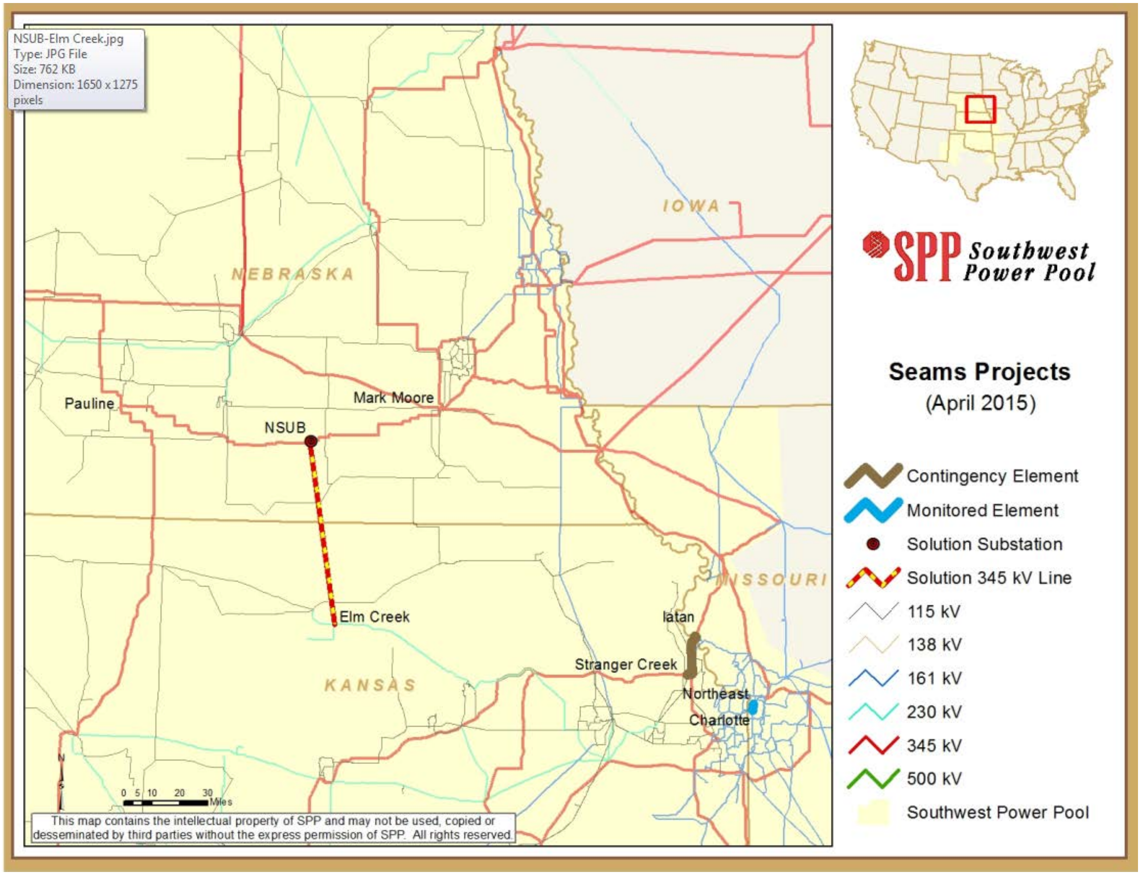
- Assumptions
  - Utilize assumptions from the most recent ITP10 business as usual future
  - ESWG may provide revisions needed due to “significant change in expected conditions”
  - Transmission topology updated to include recently approved projects
  - 10-year planning horizon

Typical Regional Study Process

- ✖ Futures development
- ☑ Model development
- ✖ Issues identification
- ✖ Solution request
- ✖ Project screening
- ☑ Project evaluation
- ☑ Benefits calculation
- ✖ Portfolio development

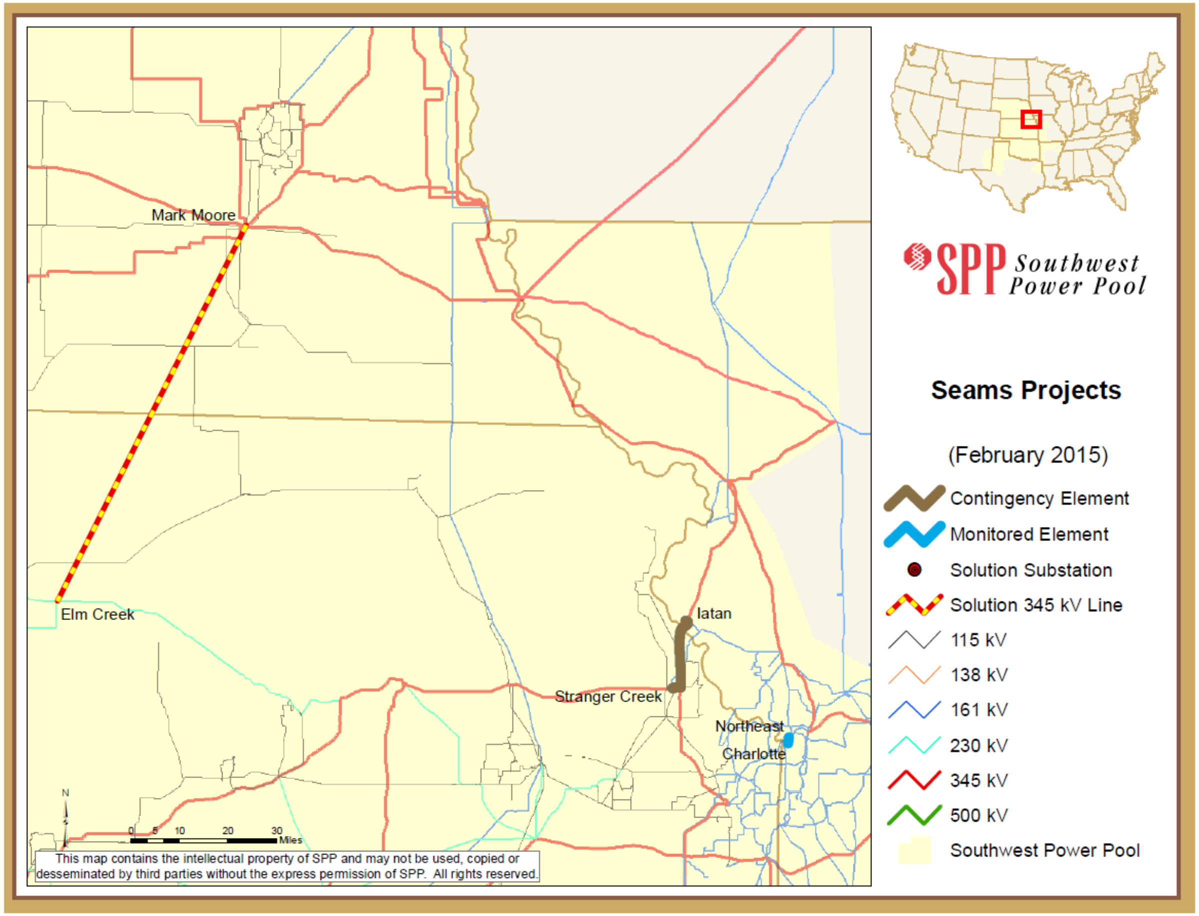
SPP-MISO POTENTIAL INTERREGIONAL PROJECTS

Elm Creek – NSUB 345kV



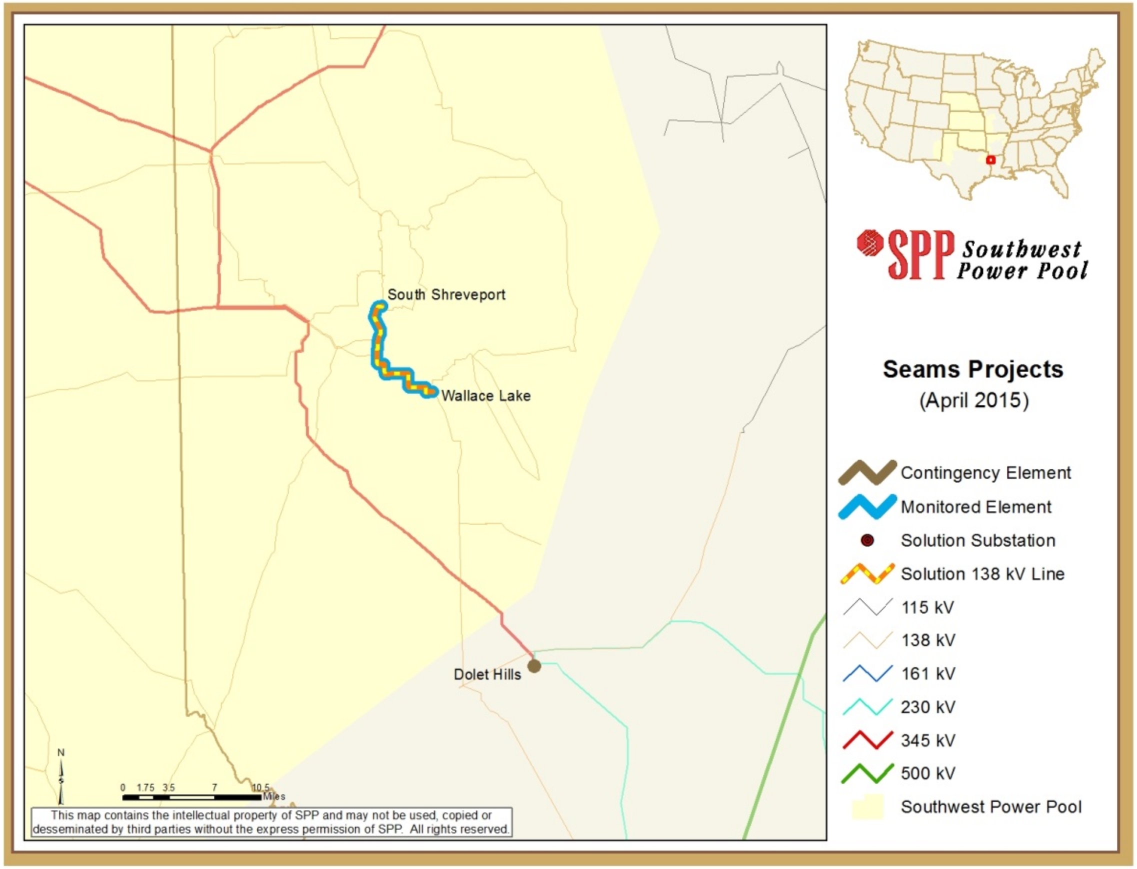
- Project details
  - New 78 mile 345kV from Elm Creek – NSUB (New Substation on the Pauline – Mark Moore 345kV line)
- E&C cost of $125 million
  - Conceptual estimate
- Preliminary Benefits
  - Total B/C of 1.51
  - 79% to SPP 21% to MISO

Elm Creek – Mark Moore 345 kV



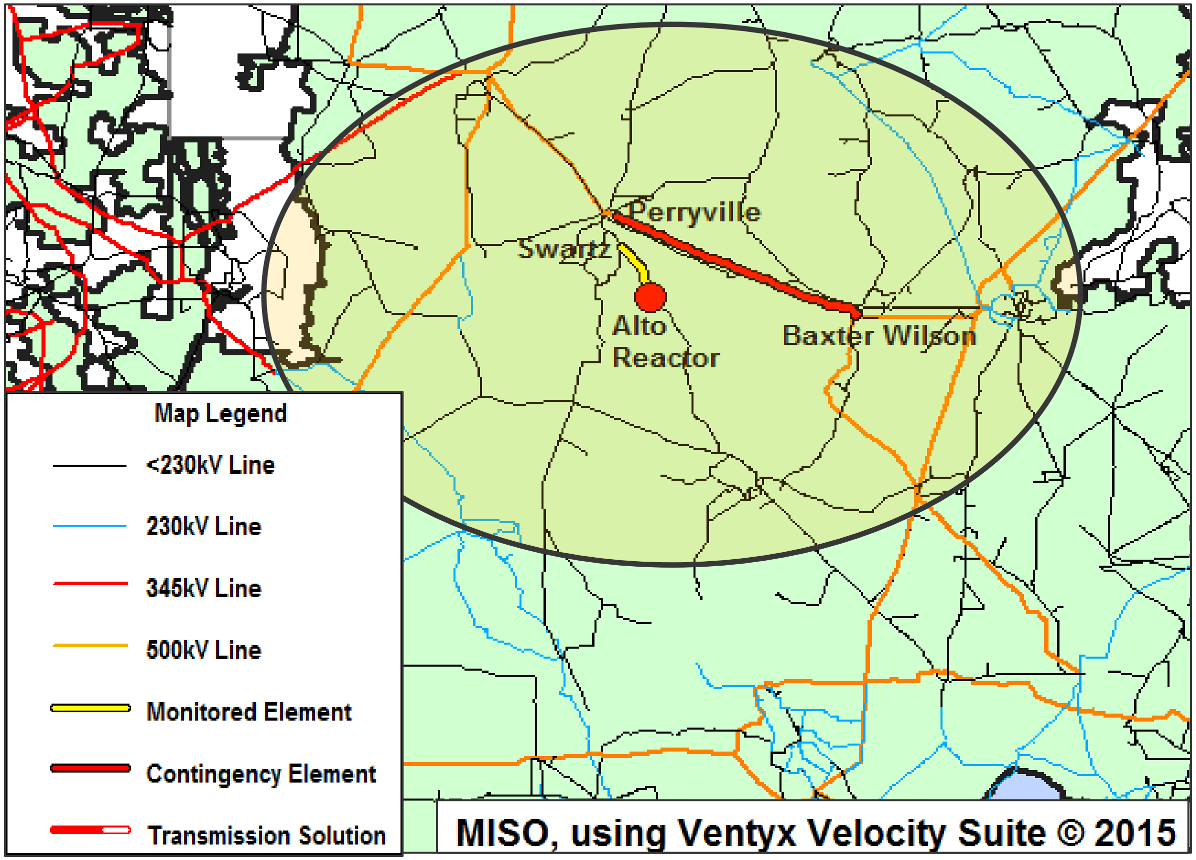
- Project details
  - New 100 mile Elm Creek-Mark Moore 345kV line
- E&C cost of $143 million
  - Conceptual level
- Preliminary Benefits
  - Total B/C of 1.6
  - 60% to SPP 40% to MISO

S. Shreveport – Wallace Lake 138 kV



- Project details
  - Rebuild 11 mile S. Shreveport to Wallace Lake 138 kV line with 344/437 MVA
- E&C Cost of $6 million
  - Conceptual level
- Preliminary benefits
  - Total B/C of 6.5
  - 29% to SPP 71% to MISO

Series Reactor on Alto – Swartz 115 V



- Project details
  - Addition of a series reactor on the Swartz – Alto 115kV line at the Alto 115kV Substation
- E&C cost of $10 million
  - Conceptual level
- Benefits
  - Total B/C of 3.5
  - 14% to SPP 86% to MISO

2015 SPP-MISO CSP REGIONAL REVIEW

2014 SPP-MISO CSP

- Scheduled to complete in June
- Analysis performed by SPP and MISO staff
- Joint stakeholder input through the IPSAC
- Comprehensive study
  - Model development
  - Issues identification
  - Solution development
  - Project evaluation
- Identifies interregional cost allocation

2015 SPP-MISO CSP Regional Review Process

- Update models as required
- Update constraint assessment from 2015 ITP10
- Evaluate project benefits
- Ensure reliability isn't negatively impacted
- Stakeholder process
  - ESWG
  - TWG
  - MOPC

Models

- Regional review methodology states that the most recent ITP10 model will be utilized
  - SPP-MISO CSP model is an updated version of the 2015 ITP10 model
- Not a new model build
- Minor updates to address known issues
  - Some updates already included in the CSP model
- Models posted
  - Including an index of model updates since 2015 ITP10 model finalized

CSP Model Updates Since 2015 ITP10

- Transmission ratings updates
- Wind contracts update
- New info on retired units
- Generator unit parameter updates
- Updated jointly owned units between SPP & MISO
- Incorporated all known 2015 ITP10 updates
- Updated 1st Tier modeling

Assumptions

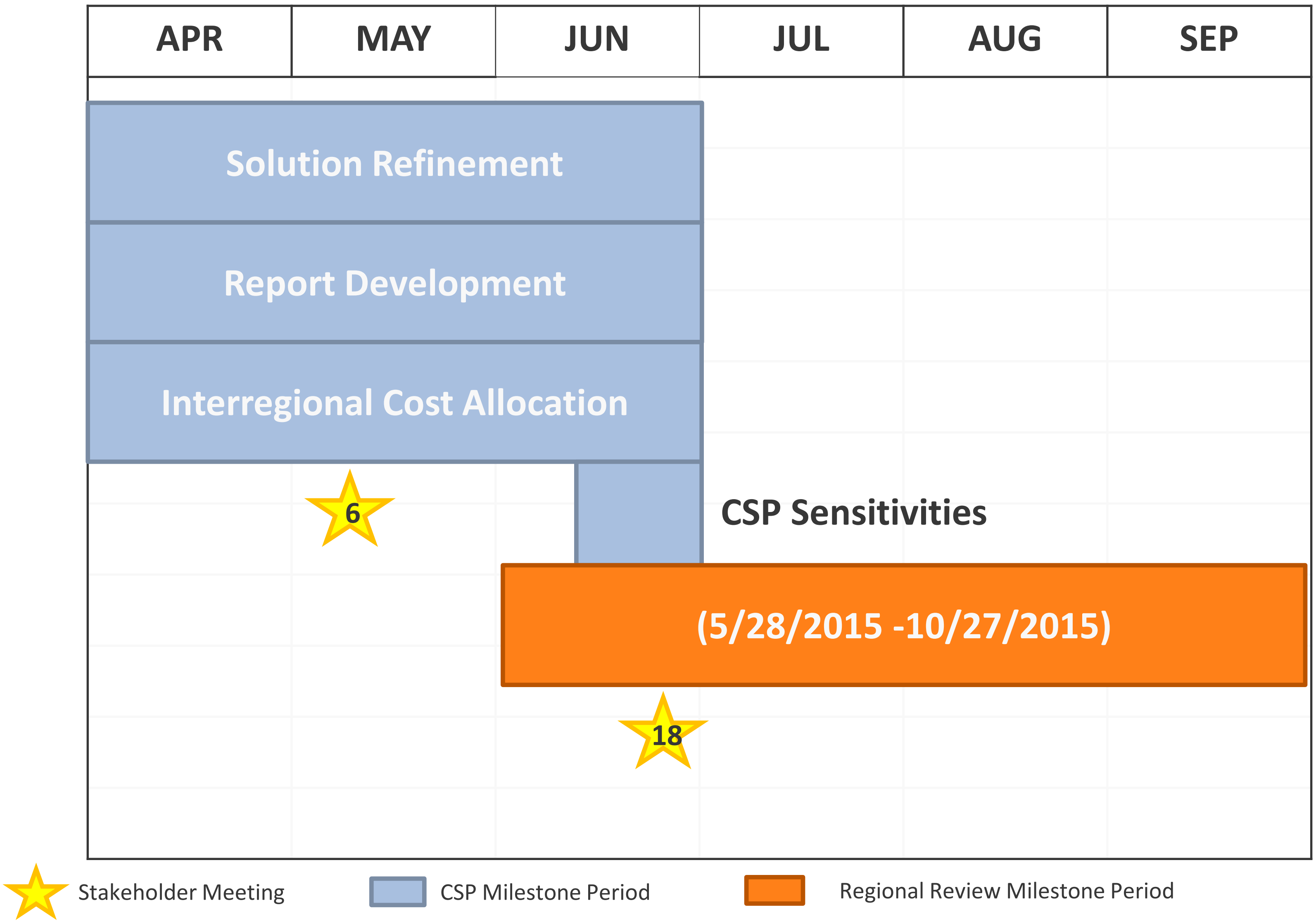
- Utilize 2015 ITP10 modeling assumption
  - Fuel prices, hurdle rates, emissions, etc.
- 2015 ITP10 resource plan
  - SPP and AECI
- 2024 in-service date for projects
  - 2019 and 2024 models used for evaluating project benefits

Project Evaluation

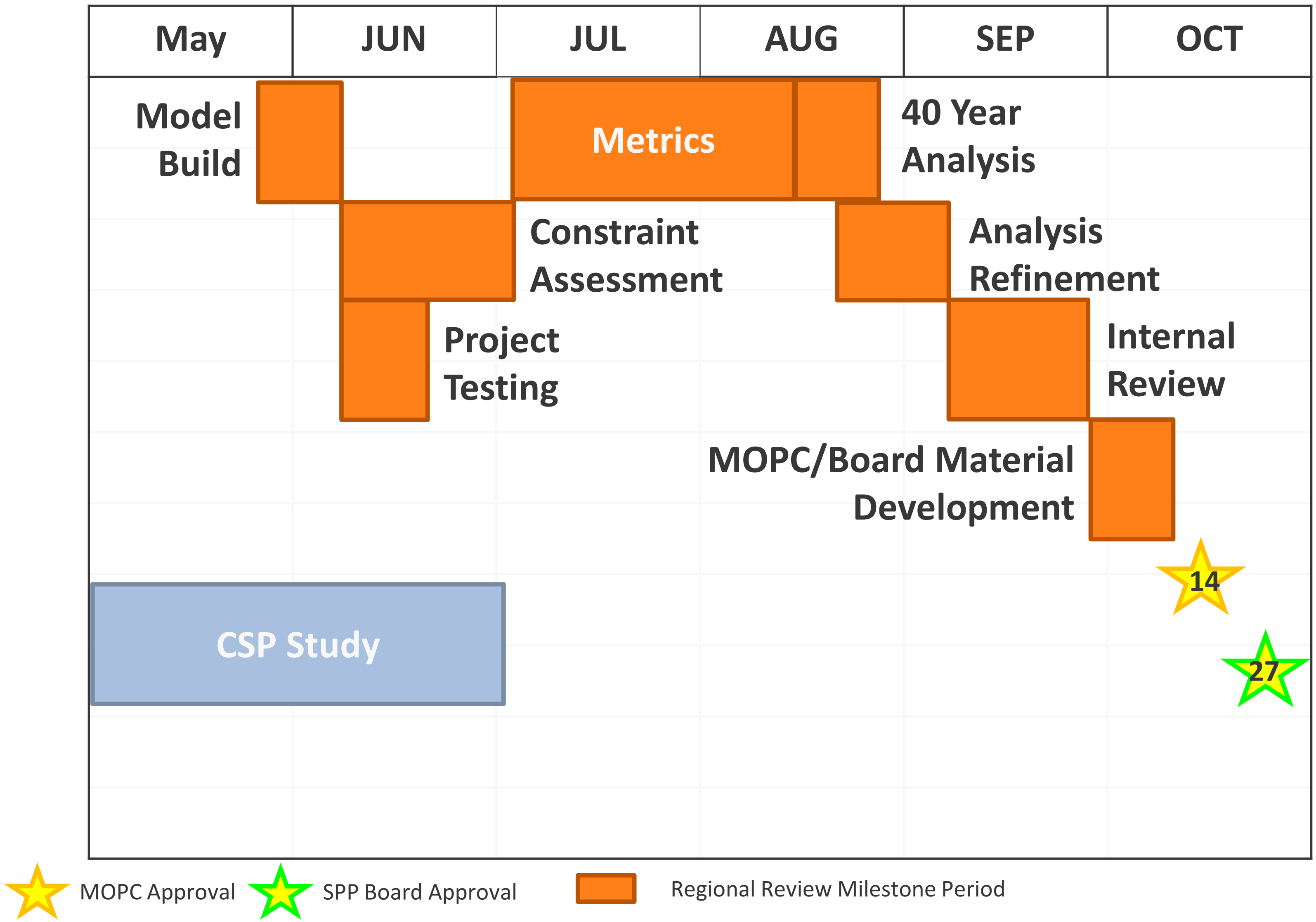
- 40-Year financial analysis of costs and benefits
- Metrics
  - Adjusted Production Cost
  - Avoided or delayed reliability project
  - Mitigation of transmission outage costs
  - Increased wheeling through and out revenues if appropriate
    - Initial evaluation to determine if there is benefit potential
- No harm reliability evaluation

TIMELINE & NEXT STEPS

MISO SPP CSP Milestone Schedule (Apr-Sep 2015)



Regional Review Milestone Schedule (May-Oct 2015)



Immediate Next Steps

- Model review
  - Model posted with index of model updates
  - Stakeholder review through June 10
- Plan to post draft scope on May 27
  - Initial stakeholder feedback through June 4
  - Updated draft posted with ESWG materials on June 11
  - ESWG action on June 18

Southwest Power Pool
Economic Studies Working Group
Charter
February 2, 2009

PURPOSE

The Economic Studies Working Group (ESWG) advises and assists Southwest Power Pool (SPP) Staff in the determination of the appropriate data, planning methods and processes to be used in the development and evaluation of economic transmission expansion options for the SPP region. The ESWG will also provide policy level support to the Cost Allocation Working Group (CAWG) on the development of Federal Energy Regulatory Commission (FERC) Order 890 related high priority economic studies. The ESWG will be responsible for data, sources, models, economic planning methodology, timing and implementation, application, economic parameters and metrics to be used in the development and evaluation of economic expansion options in the SPP region. The ESWG will also review the economic planning processes used by SPP Staff and offer proposals for improvement of these processes. The ESWG will be responsible for all economic modeling parameters and data for the SPP region, and will conduct annual updates to all data for the stakeholders. Additionally, the ESWG will be responsible for ensuring that third party consultants contracted by the SPP have access to the most appropriate, updated data.

SCOPE OF ACTIVITIES

In carrying out its purposes, the ESWG will:

1. Provide oversight and review, as appropriate, of economic planning studies by the SPP, as required per FERC Order 890, including but not limited to:
   - Balanced Portfolio – Provide guidance to the CAWG on input assumptions and modeling techniques used in the Balanced Portfolio analysis
   - EHV Overlay – Provide input into the techniques and methodology used in the on-going analysis for the EHV Overlay plan
   - STEP Economic Screening – Provide input into the annual STEP economic screening of projects
   - High Priority Economic Studies – Other high priority economic studies, as applicable

2. Provide oversight of the economic study process performed by the SPP, including but not limited to, economic transmission plan development, project interaction and the overall economic planning process

3. Provide oversight of and review Loss of Load Expectation (LOLE) studies performed by SPP staff

4. Establish study standard assumptions for economic analysis; determine and update the necessary data required to model, study, and evaluate economic alternatives on an annual basis

5. Define and update any terms used in the economic transmission planning process, including data, metrics and assumptions that provide clear understanding to conduct economic studies for SPP

6. Identify, review and modify the metrics for overall quantification and break-out of economic impacts beyond adjusted production cost savings

7. Review the solution techniques and provide recommendations for improvements and/or alternatives

8. Update and maintain the economic planning process documentation to provide controls for economic planning in SPP

9. Provide updates to the MOPC on the status and progress of economic studies and planning in the SPP

REPRESENTATION
ESWG membership will consist of up to the following:
~~14~~ 17 Voting members –

- ~~4~~ 5 Transmission Owning
- ~~4~~ 5 Transmission Using
- ~~4~~ 5 Generation
- ~~1~~ 2 Other

And 1 non-voting Regulatory Liason member.

- ~~1 Regulatory~~

Formatted: Normal, No bullets or numbering

Formatted: Font: (Default) Arial, 12 pt

DURATION
Permanent.

REPORTING
The ESWG reports to the Market and Operations Policy Committee.

Other Notes:
In light of FERC Orders 888 and 889 and the group composure of transmission and generation parties, the ESWG will have to observe the Standards of Conduct outlined in FERC Order 889. As such, there may be topics discussed by the ESWG that are privileged and confidential. Under such an event, appropriate measures will be taken to ensure that no Standards of Conduct are violated, including but not limited to, closed meetings, closed sessions, etc. Members and participants will be required to adhere to SPP's Nondisclosure Agreement.

2017 ITP10 Scope Data Inputs

SPP Staff

May 20th, 2015

Southwest Power Pool

Data Inputs & Study Methodology

- Futures
- Renewable survey
- Resource plan
- System topology
- Load & Gen review
- Fuel prices
- Emissions price
- Siting
- Define constraints
- Benchmarking
- DC Ties
- Hourly Load Profiles
- Hourly Renewable Profiles
- Needs Assessment
- Project Grouping
- Portfolio Consolidation
- Benefit Metrics
- Sensitivities
- GOF

2017 ITP10 Data Inputs

ASSUMPTIONS

Assumptions

- 2025 is year 10
- Load Forecasts
  - MDWG model 2025 summer peak
- System Topology 2025 ITP model
- Resource plan for 2020 and 2025
- Market based Dispatch

Resource Plan

- Prototypes - EIA, Lazard
  - Futures driver competitive wind
- Zonal Reserve Margin
  - 13.6% in the 2015 ITP10
  - 10.6% from the CMTF
    - Based on preliminary analysis
    - Final scenario results expected to be complete September 2015
- ESWG to develop a process to address generation that has no GIA or TSR, by June 30th

Renewable Accreditation

- In the 2015 ITP10, 5% of the total wind energy counted towards the capacity margin requirement
- GWG recently approved change to criteria 12.1.5.3.g, that for farms without historical data, capacity accreditation
  - Increased from 3% to 5% for Wind
  - 10% accreditation for Solar
- Should there be an increase in the approved accreditation criteria to account for variation of individual farms based on historical data?

Wind Capacity Factors – 2015 ITP10 Approach

- Existing wind capacity factors
  - 2005 NREL wind profile data
- New wind capacity factors
  - 2005 NREL wind profile data plus 15% capacity factor increase
  - Accounts for technology advances

Other Option

- Use newer 2012 NREL profile data adjust as needed for existing and new wind

System Topology

- System Topology from 2025 ITP model
  - Necessary modifications
- DC Ties
  - Hourly profiles
  - Confirmed transmission service
  - Include updates for IS DC Ties

Modeling Parameters

- Fuel Prices
  - For the 2015 ITP10, utilized Ventyx Reference Case for coal, oil, and uranium (including transportation costs)
  - Utilized NYMEX futures and DOE growth rates for natural gas prices
- Wind Prices
  - Used $8/MWhr for O&M and Curtailment in 2015
- Emission Price
  - For the 2015 ITP10, used Ventyx Reference Case

Benchmarking

- Year
  - For the 2015 ITP10, used 2013
- Benchmarking data
  - Capacity factor by unit type
  - Generation by unit type
  - Operating & spinning reserve
  - Coal transportation costs
- Hurdle Rates
  - Status Quo?
  - System LMPs
  - Flowgate loading
  - Production cost
  - Generation dispatch order
  - Zonal purchases & sales

Define Constraints

- NERC Book of Flowgates
- Additional constraints added using PAT
- Contingencies 100 kV and above in SPP and first-tier
- Monitored elements 100 kV and above in SPP and first-tier
- Unless other information is available, each constraint's rating will be selected based upon the applicable Rating A (normal rating) or Rating B (emergency rating) in the power flow model

Needs Assessments

- Economic, Policy, Reliability conducted in parallel
- Policy Assessment
  - Shortfall in the achievement of renewable requirements
- Economic Assessment
  - The SCED will solve nodal LMPs
  - Constraints ranked based on flowgate congestion cost
  - Top 25 constraints based upon the ranking will be identified as economic need

Solution Development

- Solicit stakeholders for solutions for all identified needs
- Policy projects: mitigate wind curtailment
- Economic projects: B/C > .9 for one year
- Reliability project: resolve criteria violations or instability
- Seams projects
  - 80/20 Cost sharing

Phase 1 – Individual Project Testing

- Projects will move on to Phase 2 for further testing if they meet the following criteria
  - The project must meet the need for which it was submitted and
    - Projects to address economic needs must provide a 1-year B/C ratio greater than 0.75 by reducing the congestion. If the project is a seams project the B/C ratio requirement is 0.60
    - Policy Projects must allow the utilities to meet the regulatory/statutory mandates and goals.

Project Grouping Methodology

- Reliability, policy, and economic projects will be combined into project groupings for each future and evaluated for redundancies
- Project groupings will be based on Phase 1 project's performance.
- Four Groupings per Future:
  - Cost Effective
  - Highest Gross APC benefit
  - Highest Net APC benefit
  - Multi-Variable Grouping

Phase 2 – Combined Project Testing

- **Cost-Effective Rank** - Total Project Cost / Flowgate Congestion Cost Mitigated
- **Highest Gross APC benefit** –Highest APC benefit, not considering the cost of the projects
  - Projects will be ranked based on the gross benefit when considering mitigation of each individual constraint
- **Highest Net APC benefit** –The cost of the projects will be subtracted from the APC benefit provided
  - Projects will be ranked based on the net benefit when considering mitigation of each individual constraint
- **Multi-Variable Grouping** – Allows SPP staff to layer multiple criteria. The experience gained from analyzing projects for the first three groups will be utilized to determine projects

Consolidation in the 2015 ITP10

- Economic projects with a 1-year B/C ratio greater than 0.9 in Future 1
- Economic projects with a 1-year B/C ratio greater than 0.7 in Future 1, but that also had a 1-year B/C ratio greater than 0.9 in Future 2
- Policy projects were be included in the consolidated portfolio if they meet a policy need in Future 1.
- Reliability projects were included if they mitigated a thermal/voltage violation in Future 1
- A Future 2 reliability project was included if it mitigated a thermal violation in Future 2 and mitigated loading above a 90% threshold in Future 1. A Future 2 project that mitigates a voltage limit violation in Future 2 and voltage below 0.92 pu in Future 1 was also included.

Project Staging criteria in the 2015 ITP10

- Single project classification
  - Economic – based on a linear interpolation of B/C ratios from 2020 to 2025
  - Reliability - based on linear interpolation of thermal loadings from 2020 to 2025
  - Policy – staged to meet renewable requirement
- Multiple project classification
  - Staged to meet the earliest need date established through the Single Project Classification
  - Economic projects must cross the 1.0 B/C ratio threshold

Benefit Metrics

Metric Description
APC Savings
Value of Replacing Previously Approved Projects
Reduced Losses
Reduced Capacity Costs
Reduction of Emissions Rates and Values
Public Policy Benefits
Assumed Benefit of Mandated Reliability Projects
Mitigation of Transmission Outage Costs

Sensitivities

- In the 2015 ITP10
  - Natural Gas Price
  - Demand levels
  - Tres Amigas and Clean Line Plains & Eastern
  - Increased Input Prices

2017 ITP10 Scope Futures Assumptions

SPP Staff

May 21st, 2015

SPP Southwest Power Pool

BOD Approved Futures

- Future 1 – Regional Clean Power Plan Solution
  - Assumes that the EPA Clean Power Plan will be implemented at a Regional level by meeting emissions targets within the SPP footprint
- Future 2 – State Level Clean Power Plan Solution
  - Assumes that the EPA Clean Power Plan will be implemented at a State level
- Future 3 – No Clean Power Plan Solution
  - Assumes that the EPA Clean Power Plan is not implemented

*Each future also assumes: Competitive Wind (Sub $24/MWh prices); High availability of natural gas due to hydraulic fracturing (fracking); Load growth as expected; Large scale solar generation development (mixed with smaller scale in Future 3)

Drivers

Driver	Future 1	Future 2	Future 3
111D	Regional 111D	State 111D	No 111D
Competitive Wind	Yes	Yes	Yes
NG Supply - High Supply Due to Fracking	Yes	Yes	Yes
Severe Weather	Sensitivity	Sensitivity	Sensitivity
Long-Term Drought			
Winter impacts			
Load Growth	Normal	Normal	Normal
Cost of Capital Changes (Significant Increase)	Sensitivity	Sensitivity	Sensitivity
Limited ability to build			
8-12% interest payments			
Solar Development (Substantial)	Large Scale	Large Scale	Large Scale/Roof Top
Impact on Generation Due to Constraints	Modeling Issue	Modeling Issue	Modeling Issue

2017 ITP10 Data Inputs

FUTURES ASSUMPTIONS

CPP Future

What does it impact?

- Fuel Prices
- Emission Prices
- Retirements
- Resource Expansion

IMPACTED INPUTS

Inputs

Must Run Units

- Remove all must run flags on base load units for futures 1 and 2

Fuel Prices

- Gas Price
  - NYMEX futures include expectation of CPP impact?
    - Change in gas price for F1&F2 or F3
- No other Fuel Price changes

Gas Price Increase/Decrease

	Month	2SD	Hi Sens Gas Price	Low Sens Gas Price
Henry Hub NG .FGB	1	28.44%	Jan HH price * (1 + 0.2844)	Jan HH Price * (1 - 0.2844)
Henry Hub NG .FGB	2	24.83%	Feb HH price * (1 + 0.2483)	Feb HH Price * (1 - 0.2483)
Henry Hub NG .FGB	3	19.31%	Mar HH price * (1 + 0.1931)	Mar HH price * (1 – 0.1931)
Henry Hub NG .FGB	4	17.25%	Apr HH price * (1 + 0.1725)	Apr HH price * (1 - 0.1725)
Henry Hub NG .FGB	5	19.60%		
Henry Hub NG .FGB	6	18.21%		
Henry Hub NG .FGB	7	24.99%		
Henry Hub NG .FGB	8	28.20%		
Henry Hub NG .FGB	9	37.97%		
Henry Hub NG .FGB	10	45.77%		
Henry Hub NG .FGB	11	42.26%		
Henry Hub NG .FGB	12	23.07%		

EPA Goal Calculation and Implementation

- Utilize current EPA calculations?
  - Utilize SPP CPP analysis
    - Adjustments for interim goal study year
  - Expectation of change in goal computation
- Utility responsibility of units operating in the SPP footprint
- Treatment of existing units vs. new units

EMISSIONS LIMITING TOOLS

Limiting Emissions

What is the goal?

How do we get there?

Software limitations

- How to overcome

Carbon Cost Adder

Limiting emissions

- driving dispatch, which
- changes resource expansion
- $36/ton adder in 2015 ITP10 Future 3
- $45/ton adder in SPP regional CPP study

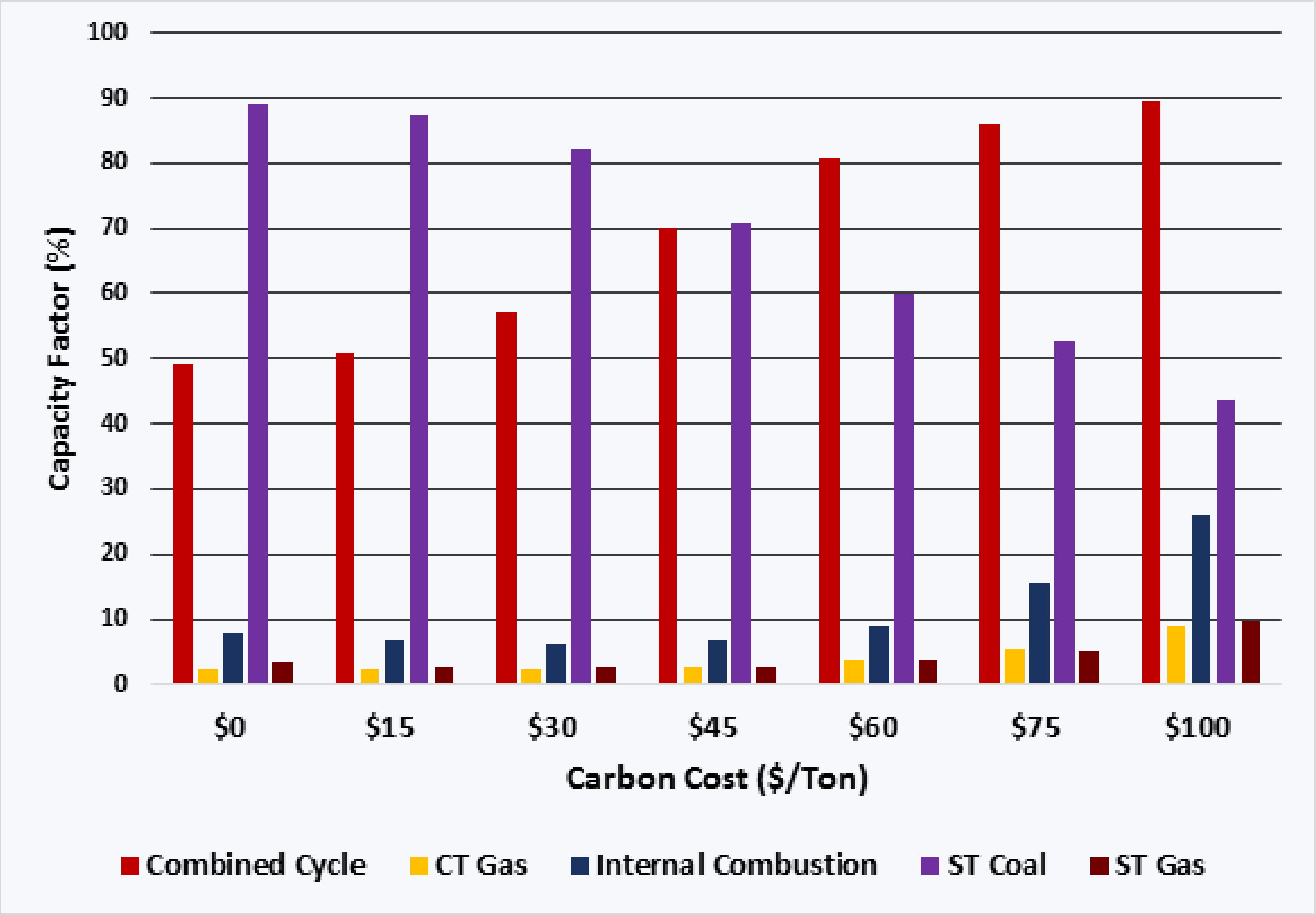
Future 3

- Zero CO_2 emission limits

Futures 1 and 2

- Regional CO_2 price
- State by State CO_2 price
- Inter-regional Impacts
  - Tier 1 CO_2 price?
  - Hurdle Rates?

SPP CPP Carbon Cost Analysis



Energy Efficiency

- Current expectation of energy efficiency in MDWG load forecasts
  - How to capture the impacts in the analysis?
- Blanket peak and/or energy reduction in CPP Futures
  - Allow for zonal exceptions
- Peak and Load growth reduction of 1% per year in SPP regional CPP study

Unit Retirements

- Age/sized based approach
- Heat/emission rate based approach
- Strategist directed retirements

ITP Resource Expansion Methodology

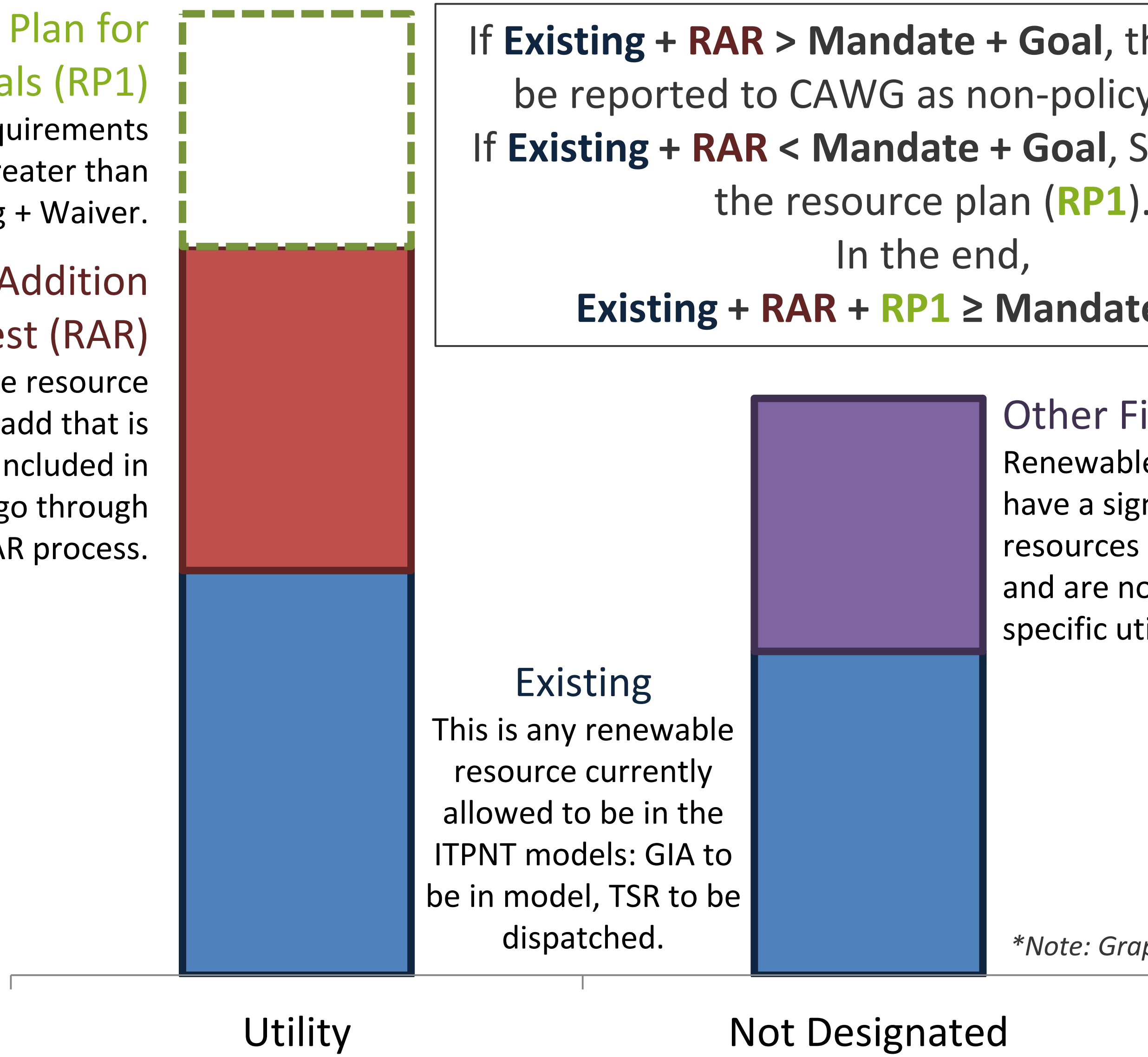
ESWG

Kelsey Allen
May 21st, 2015

Southwest Power Pool

Resource Expansion Methodology

If **Existing** + **RAR** > **Mandate + Goal**, the surplus will be reported to CAWG as non-policy resources.
If **Existing** + **RAR** < **Mandate + Goal**, SPP will add to the resource plan (**RP1**).
In the end,
Existing + **RAR** + **RP1** ≥ **Mandate + Goal**



Resource Plan for Mandates/Goals (RP1)
These renewable requirements may or may not be greater than Existing + Waiver.

Resource Addition Request (RAR)
This is any renewable resource a utility would like to add that is not currently included in Existing. This will go through the RAR process.

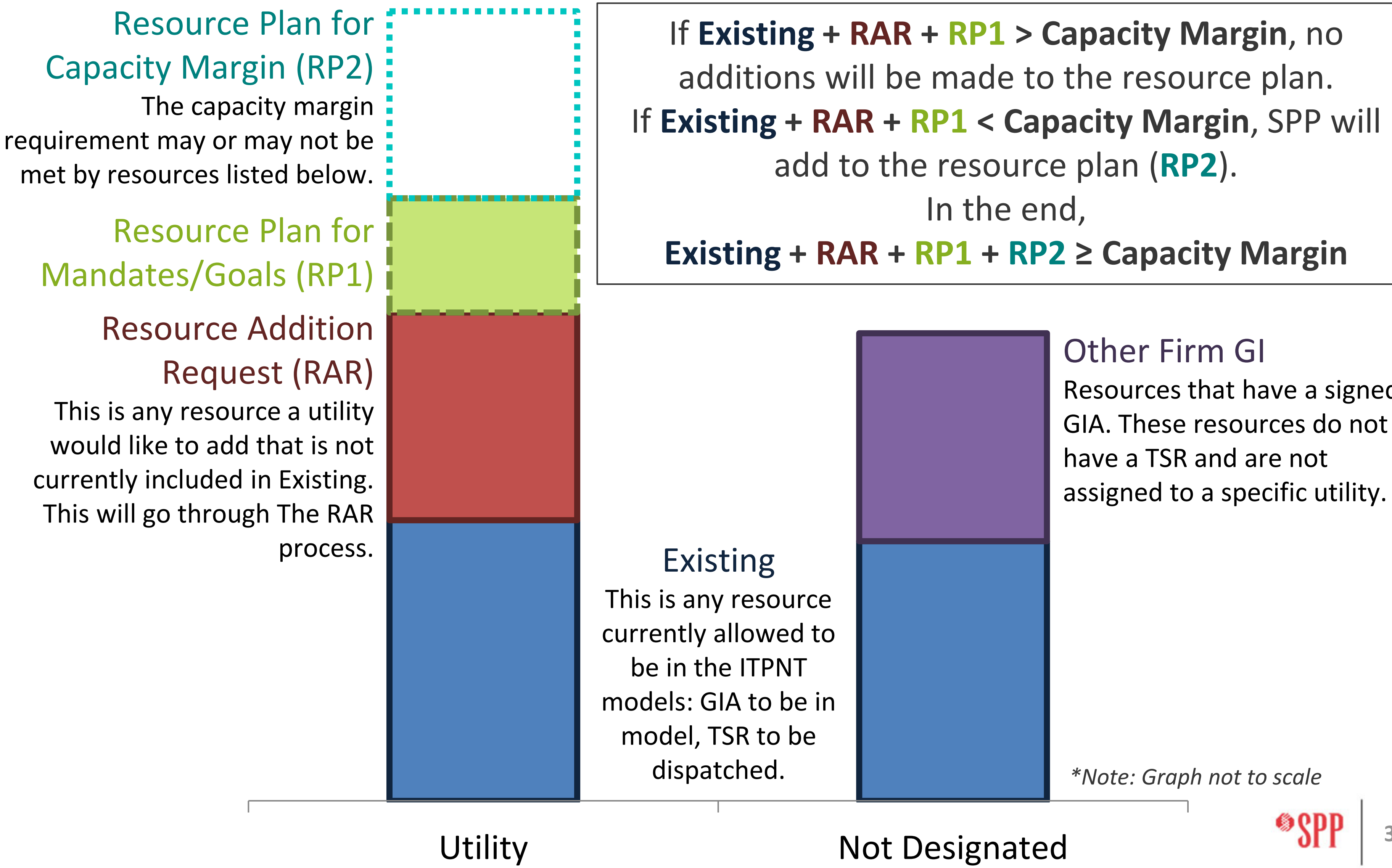
Existing
This is any renewable resource currently allowed to be in the ITPNT models: GIA to be in model, TSR to be dispatched.

Other Firm GI
Renewable resources that have a signed GIA. These resources do not have a TSR and are not assigned to a specific utility.

**Note: Graph not to scale*

Resource Expansion Methodology

If **Existing** + **RAR** + **RP1** > **Capacity Margin**, no additions will be made to the resource plan.
If **Existing** + **RAR** + **RP1** < **Capacity Margin**, SPP will add to the resource plan (**RP2**).
In the end,
Existing + **RAR** + **RP1** + **RP2** ≥ **Capacity Margin**



**Note: Graph not to scale*

Additional Block Details

- Other Firm GI
  - Resources with signed GIAs
    - Not in ITPNT models
    - On schedule with minimal network upgrade costs
  - Staff-driven
  - Results in non-designated resources
  - Potentially leverage for RP1

Service Status	Designated?	Wind Capacity (MW)	Non-Wind Capacity (MW)
Existing	No	238.5	24.2
Projected	No	4040.4	324.5

Table shows resources that could have been added to the 2015 ITP10 (less Other Renewables) today with the proposed methodology.

Additional Block Details

- Resource Addition Request (RAR)
  - Leverage ITPNT waiver process
    - Add ESWG vetting
    - Process defined in ITP Manual Section 3.3.1.2
  - Stakeholder-driven
  - Results in utility designation
- Suggested Changes to process
  - Remove TSR requirement
  - Required- RAR for publically announced resource expansion
  - Optional- RAR for non-public resource expansion

Staff Recommendation

SPP Staff recommends the ESWG approve

1. **The use of a resource addition request (RAR) under circumstances where information on generator or PPA commitment is publically available, and**
2. **Designation of the Other GI Firm resources to utilities by Staff for any potential Mandate or Goal shortfalls.**

Next Steps

- Staff will send Renewable Survey to utilities May 15^{th}
- Resource Plan will begin in June

APPENDIX

ITP Manual Resource Addition Request

From ITP Manual Section 3.3.1.2

Confirmed Long Term Firm transmission service is included in the ITP reliability models. In addition to Confirmed Firm service mentioned above, the following will also be included: 1) transactions to make generation and load match. ; 2) proposed generation stations and associated service from new generation that has a high probability of going into service; i.e. If a planned generating resource does not have a TSR filed service agreement but does have both a high probability of going into service and a high probability of obtaining an executed transmission service agreement, that new generator's service can be included in the SPP regional reliability planning models if it meets all of the following requirements:

ITP Manual Resource Addition Request

- *A formal request has been sent to SPP requesting the generation capacity be included into the ITP;*
- *The generating resource has a FERC-filed IA not on suspension or FERC-filed interim IA;*
- *The generating resource has acquired the funding for major equipment;*
- *The generating resource has entered the Aggregate Study or equivalent; Transmission Owner transmission service study publicly posted on OASIS and has a completed facility study that is waiting for final results without unmitigated third party impacts;*
- *The generating resource has acquired air and environmental permits where applicable;*
- *The generating resource has started construction with major equipment procurement contracts awarded; and*
- *The generating resource's unit(s) must be dispatchable and committable.*

ITP Manual Resource Addition Request

- ***If a generating resource does not meet all the above requirements, a formal request for generation capacity to be included in the ITPNT can be made to TWG on a case by case basis.***
  - ***TWG will take into account the following, but not limited to, additional points:***
    - *An exception to include service from generation that will defer transmission expenditure(s) without a TSR filed service agreement and without a filed IA or a filed interim IA that have a high probability of going into service and also getting both an executed IA and an executed transmission service agreement must meet all of the below requirements:*
    - *A formal request has been sent to SPP requesting the generation capacity be included into the ITP. The request should identify which transmission upgrades will be deferred*
      - *The generating resource has a mitigation plan for the deferred transmission upgrades until it makes a financial commitment to perform the upgrades*
      - *A Definitive Interconnection System Impact Study Agreement (DISIS) for the generating resource has been executed, an interim IA has been requested when the DISIS was posted and a final IA was FERC filed when applicable*
      - *An RFP for the generating resource has been awarded, if applicable*

ITP Resource Siting Methodology

Chris Jamieson
5/20/2015

SPP Southwest Power Pool

Introduction

- ESWG Action Item
  - Develop a SPP Independent Siting Process
- Understand and Document Siting Objectives
- Research
- Next Steps
  - Draft and review straw man proposal
  - Determine siting process for 2017 ITP10
  - 2017 ITP10 Siting - September through January 2015

Siting Research

- SPP Process to date
- Other RTO processes
- Utility Processes
- Regulatory Body Processes

SPP Siting Process

- **ITP Manual (Screening level exercise)**
  - Do not use transmission as initial siting factor: Let geography and existing infrastructure guide placement of proxy generation. Existing transmission used as a weighting factor rather than a primary siting factor.
  - Site proxy generation by zone: Site expansion model generation in zone with highest capacity needs.
  - Avoid greenfield siting for NG fired capacity: NG generation is flexible to site. Locating generally more peaking NG generation near load centers will have tendency to reduce impact on transmission system.
  - Limit capacity to 2,400 MW maximum per location: Limiting total capacity per location potentially minimizes impact of contingencies removing large blocks of capacity from service.

SPP Siting Process

- 2013 ITP20 siting process (Suitability Analysis)
  - Data Acquisition
  - Data Processing - Included Uncommitted GI Locations
  - Weighted Overlay Analysis
  - Resource Siting

Other RTO Processes

- MISO Process
  - Consideration of GI Queue resources (Planned, Future, and Canceled)
  - Siting rules per future
  - Site Priority
    - GI Queue resources
    - Brownfield Sites
    - Retired/mothballed sites that have not been re-used
    - Greenfield sites using GI Queue
    - Greenfield sites using Greenfield siting methodology
  - Specific greenfield siting rules per resource type

https://www.misoenergy.org/_layouts/MISO/ECM/Redirect.aspx?ID=184861
MTEP14 Appendix E2 – EGEAS

Other RTO Processes

- PJM Process
  - Model Queued Generation by queue priority and status as needed
- ERCOT Process
  - Resource Type Suitability by County
  - Use 345kV buses
  - Use highest LMP for competing sites
  - Siting Priority similar to MISO

https://www.pjm.com/documents/reports/rtep-documents.aspx
White Paper (PDF)7.2.2014
http://www.ercot.com/content/committees/other/lts/keydocs/2013/DOE_LONG_TERM_STUDY_-_Draft_V_1_0.pdf
http://www.ercot.com/content/meetings/rpg/keydocs/2014/0722/LTSA_7-22-2014_Scenario_Results.ppt

Siting Objectives Discussion

- Site Resources from SPP’s Resource Plan Process
  - Up to 20% of the conventional resources in the study
  - Includes Conventional and Renewable Resources
- What are some siting dos and don'ts?
- What are the gaps with existing suitability analysis?

Concepts for Consideration

- Use previous study resource sites
- Leverage GI queue and study results to a reasonable extent
- Expand suitability analysis
- Point of interconnect (POI) Available Transfer Capability to minimize Generator Outlet Facilities
- Load pocket analysis to recognize needs to locally site capacity versus energy based resources

2017 ITP10 Data Inputs

SITING OPTIONS

Use Subset of Previous Study Resource Sites

- Schedule impact – minimal
- 2013 ITP20 and 2015 ITP10 siting previously approved by stakeholders
- Siting assumed to qualitatively account for suitability, load pocket/center needs, reasonable levelization of LMPs, and minimization of Generator Outlet Facilities
- Generator Outlet Facilities determined in the 2015 ITP10 for some sites may well exceed historic average cost of Network Upgrades experienced in the SPP Generation Interconnection process
- Entire set of resources may not be a perfect fit to deal with retirement/replacement, and large scale solar additions for futures
- Does not fully account for Upper Missouri Zone (UMZ) needs
- Recommend criteria and adjustments needed to address minimization of GOFs, retirement/replacements, and large scale solar additions
- Work with UMZ stakeholders as needed

Leverage GI Queue and Study Results

- Schedule impact – minimal
- Provides potential sites and statistics for both conventional and renewable resources to draw reasonable conclusions
- Primarily addresses more probable siting of wind resources given historic and present demand for generation interconnection of wind resources, more stringent GI application requirements, and more definitive study results
- Does not address capacity factor and LMP differences between sites and may not fully account for Upper Missouri Zone (UMZ) needs
- Example: Hypothetically there are 30 GI wind requests in a Definitive Impact System Impact Study
  - 20 GI requests are assigned upgrade costs that well exceed the historic average to GI positions that proceed to commercial operation
  - 10 GI requests are assigned upgrade costs that are well below the historic average of GI positions that proceed to commercial operation
- Recommendation would be to develop criteria to determine anticipated wind resources using the SPP and IS GI queue and study results

Further Develop SPP Suitability and Weighted Overlay Analysis

- Schedule impact – maximum
- Current suitability model has not been a primary tool to determine sites for ITP10 and ITP20 studies
- Need to ensure that the suitability problem and model has been properly defined for resource plan prototypes, tested, and quality assured before going into production
- Need to address potential gaps
    - Fuel supply assurance, cost, and transportation differences for conventional prototypes
    - Capacity Factor differences for renewable prototypes
    - Footprints of existing wind and solar sites
    - Generation outlet capability and approximation of incremental upgrade costs ($/standard prototype size in MW)
    - Load pocket/center reliability needs
    - Approximate LMP differences

Point of interconnect (POI) Available Transfer Capability to Minimize Generator Outlet Facilities

- Schedule impact – average
- The goal would be to minimize the need for generation outlet facilities
- Preliminarily use to adjust current resource plan for 2017 ITP10 and ultimately use as an input into an expanded suitability and weighted overlay analysis
- Use historic average cost of Network Upgrades assigned in the SPP Generation Interconnection process as a benchmark
- Use as a prescreening tool for ITP10 Generator Outlet Facility process
- Use Siemens MUST First Contingency Incremental Transfer Capability per POI and approximately price mitigations to determine ($/standard prototype size in MW)

Load Center/Pocket Analysis

- Schedule impact – maximum
- Levelization of LMPs
- Recognize needs to locally site capacity versus energy based resources
- Reduce impacts of voltage and angular stability concerns for capacity sited remotely
- Reduce substantial transmission investments needed for reliable deliverability of remote resources