SPP Southwest Power Pool

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

July 9th, 2015

AEP Offices 8th Floor, Dallas, TX

• SUMMARY OF ACTIONS TAKEN •

1. Endorsed the regional review model, as posted, with comments for material changes due back by July 23rd for approval.
2. Approved SPS's request to include two New Mexico solar facilities in the 2017 ITP10 model.
3. Approved SPP Staff's recommendation to focus benchmarking on validation of the current year study model and to determine a new methodology for determining hurdle rates.

Southwest Power Pool

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July 9th, 2015

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• 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 21 in-person participants and 41 web conference participants, representing 11 of 12 ESWG members. (Attachment 1 – July 9th, 2015 Attendance List)

Agenda Item 1b – Receipt of Proxies

Alan Myers (ITC Great Plains) asked for any proxy statements. Two proxies were identified; Al Tamimi (SUNC) named Liam Stringham (SUNC) as his proxy, Tim Owens (NPPD) named Kurt Stradley (LES) 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 – July 9, 2015 Agenda)

> **Kurt Stradley (LES) made a motion; seconded by Kip Fox (AEP-Transource) 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 – Regional Review Model

Brett Hooton (SPP Staff) presented on the Regional Review Model. The model has been posted online for review and SPP staff has received no feedback since the latest posting. The model needs to be approved to allow time for benefit metrics to be calculated by August 17th. ESWG members requested more time to review, but endorsed the version posted on July 2nd. (Attachment 5 – 2015 Regional Review Model Approval)

> **Kip Fox (AEP-Transource) made a motion; seconded by Kurt Stradley (LES) to endorse the regional review model, as posted, with comments for material changes due back by July 23rd for approval. The motion was approved unanimously.**

Agenda Item 4 – Transmission Planning Improvement Task Force (TPITF) Update

Alan Myers (ITC Great Plains) gave an update on the status of the TPITF. The task force is making substantial progress involving rearrangements to the planning process. The group has agreed to keep the concept of an ITP20 study, but has not determined the details of this yet. The main discussion in the last meeting was about combining the ITP Near-Term and ITP10 assessments. Some still want to consider combining the ITPNT and TPL assessments. Staff is investigating the feasibility of these options.

Agenda Item 5 – Study Schedules

Agenda Item 5a – 2017 ITP10

Juliano Freitas (SPP Staff) gave an update on the status of the 2017 ITP10 Study. Staff has begun phase one of the resource plan milestones and is working with Lazard on prototype information. SPP staff is also working on both the economic and powerflow models. Phase one of the resource plan (additions needed to meet statutory/regulatory renewable mandates and goals) will need to be approved by July 29th. (Attachment 6 – 2017 ITP10 Schedule)

Agenda Item 5b – RCAR II

Juliano Freitas (SPP Staff) reminded the group that the powerflow model must be approved by October 1st to stay on schedule. Also, if changes to the process for dealing with trapped generation and load pockets need to be made, a decision is needed by November 18th in order to be brought to the MOPC and BOD prior to implementation. Alan Myers (ITC Great Plains) directed members to review the previous presentations and be prepared to make a decision at the next meeting.

Agenda Item 6 – 2017 ITP10 Resource Additions

Agenda Item 6a – Resource Addition Requests (RAR)

Bennie Weeks (SPS) presented a resource addition request to the group. SPS would like to include two 70 MW solar facilities in Southeast New Mexico, planned to go into service in December; these are economic purchases. (Attachment 7 – SPS Resource Addition Request)

> **Kip Fox (AEP-Transource) made a motion; seconded by Kurt Stradley (LES) to approve SPS's waiver request to include two New Mexico solar facilities in the 2017 ITP10 model. The motion was approved unanimously.**

Agenda Item 6b – Non-Designated Resources

Kelsey Allen (SPP Staff) addressed the group, due to the confidential nature of the non-designated resources; staff is suggesting we go with an 'all in' or 'all out' approach to our list. The resources on the list meet the criteria for inclusion: Interconnection agreement, minimal network costs, and a high likelihood of going into service. The group was concerned that some of these units would not end up going into service. Many members felt that this list should not go into the model, but should be used for siting considerations instead. Paul Dietz (Westar) made a motion; seconded by Bennie Weeks (SPS) to remove all future non-designated resources (NDR) from the base case 2017 ITP10 model. Steve Gaw (Wind Coalition) stated that this process should be about more accurate modeling and if there is significant evidence a project will go into service, then modeling would be improved if that fact were acknowledged. The current motion draws a line between whether a generator is designated to a Transmission Owner (Load Serving Entity), which discriminates against merchant facilities. Paul Dietz (Westar) mentioned that everyone has had the opportunity to make their case. Chair Alan Myers (ITC Great Plains) requested a roll call vote. The motion failed with three in favor, 7 opposed, and two abstentions..

Member	NDR Vote
Liam Stringham	abstain
Alan Myers	no
Bennie Weeks	yes
Don Le	no
Kip Fox	abstain
Kurt Stradley	no
Leon Howell	no
Michael Watt	yes
Pat McCool	no

Paul Dietz	yes
Randy Collier	no
Tim Owens	no

ACTION ITEM: SPP Staff will continue review of the resources and criteria with stakeholders to discuss these units, and will send out a request to transmission and generation owners for further information on these units.

Agenda Item 7 – RR56 – Upgrade Determination & Short-Term Reliability Process

Tony Green (SPP Staff) reviewed the competitive upgrade determination flow chart with the group. The group requested that it be made clear in the business practice that the Short-Term Reliability Project process does not apply to economic or public policy projects. (Attachment 8 – RR56 Comment Form_PCWG_and_SPP staff_06-30-2015)

Agenda Item 8 – MOPC Action Item 255

Kelsey Allen (SPP Staff) reminded the group of MOPC action item 255: Review the method to determine the cost of congestion, as it relates to outages for rebuilds approved. The group agreed that there is a cost that is not being captured, but did not determine an appropriate way to quantify the cost of congestion and where it should apply in the process. The discussion centered on the questions of how to measure the cost, how impactful it is in assessing overall benefits, whether or not it should be associated with the long-run use of a transmission line, and tied into the discussion of the cost of routine transmission outages that we do not capture in a long term study. SPP staff was directed to compile the comments from the group and to bring back options for discussion.

ACTION ITEM: SPP Staff compile comments from the group and develop a "straw man" proposal for discussion.

Agenda Item 9 – 2017 ITP10 Scope

Agenda Item 9a – Portfolio Consolidation Methodology

Kelsey Allen (SPP Staff) reviewed the consolidation methodology discussion from the June 18th ESWG meeting. The group wants a methodology flexible enough to allow high value projects from each future. A 'no-regrets' set of projects was discussed, which could include only projects that show benefit in all three futures. Another set of projects could be developed as a 'value' set which have value within the context of the ITP10 study but may be less certain than those selected as 'no regrets'. The ESWG sees value in weighting the futures and looking at the weighted APC for projects that are not in all three futures.

ACTION ITEM: SPP staff will compile the notes from the discussion and bring back for further discussion in the next meeting. (Attachment 9 – Portfolio Consolidation)

Kip Fox (AEP–Transource) named Jim Jacoby (AEP) as his proxy beginning at 1:00 PM.

Agenda Item 9b – Data Inputs and Methodology

Kelsey Allen (SPP Staff) reviewed the assumptions that have already been approved for the 2017 ITP10. Discussion then moved on to the benefit metrics, should staff calculate all 8 metrics and which future(s) should they be calculated on? Should the metrics be calculated on the full portfolio or only on projects that would get an NTC? Staff was directed to gather more information and bring back a recommendation at a future meeting.

The next item discussed regarded the sensitivity analysis to be performed on the final portfolio. Staff recommended to perform natural gas prices and demand levels sensitivities in the Futures 3 model (expected case). The group agreed with the sensitivities but not the model suggestion

Kelsey Allen (SPP Staff) then presented two options to the group on benchmarking. The first option focusses benchmarking efforts on quality assurance and validation of the study year economic model.

The other is to create a historical model to benchmark against. SPP Staff recommends using option one and determining a new methodology for determining hurdle rates. (Attachment 10 – Data Inputs and Methodology)

> **Don Le (NextEra) made a motion; seconded by Bennie Weeks (SPS) to approve SPP Staff's recommendation to focus benchmarking on validation of the current year study model and to determine a new methodology for determining hurdle rates. The motion was approved with one abstention. Jim Jacoby (AEP) abstained.**

<u>Closing Items</u>

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

List of action items from the meeting:

1. SPP Staff will continue review of the resources and criteria with stakeholders to discuss these units, and will send out a request to transmission and generation owners for further information on these units.
2. MOPC action item 255: Review the method to determine the cost of congestion, as it relates to outages for rebuilds approved. SPP Staff to compile comments from the group and develop a "straw man" proposal for discussion.
3. SPP staff will compile the notes from the discussion and bring back for further discussion in the next meeting.

The meeting was adjourned at 1:59 PM.

Respectfully Submitted,

Kelsey Allen
ESWG Secretary

Southwest Power Pool

Southwest Power Pool, Inc.

Economic Studies Working Group

July 9, 2015

AEP Office/Dallas, TX

• ATTENDANCE LIST •

Name	Company
Kelsey Allen	SPP
Jordan Schmick	Xcel Energy/SPS
Pat McCool	KCPL
Steve Gaw	Wind Coalition
Kurt Stradley	LES
Kip Fox	AEP
Don Le	NextEra Energy
Juliano Freitas	SPP
Alan Myers	ITC
Chris Jamieson	SPP
Tim Soles	OXY
Bennie Weeks	Xcel/SPS
Michael Wegner	ITC
Al McKinnie	MO PSC
Bethany King	EDE
Jim Jacoby	AEP
Meena Thomas	Texas ~~Co~~ PUC
Michael Massery	AECC
Natasha Henderson	GSEC
Bruce Cude	Xcel/SPS
John Bell	KCC

Name	Attendance	Company
Adam McKinnie	In Person	MO PSC
Alan Myers	In Person	ITC Great Plains
Bennie Weeks	In Person	Xcel\SPS
Bethany King	In Person	Empire
Bruce Cude	In Person	Xcel/SPS
Chris Jamieson	In Person	SPP
Don Le	In Person	Nextera Energy Trans
Jim Jacoby	In Person	AEP
John Bell	In Person	KCC
Jordan Schmick	In Person	Xcel Energy/SPS
Juliano Freitas	In Person	SPP
Kelsey Allen	In Person	SPP
Kip Fox	In Person	AEP-Transource
Kurt Stradley	In Person	LES
Meena Thomas	In Person	Texas PUC
Michael Massery	In Person	AECC
Michael Wegner	In Person	ITC Great Plains
Natasha Henderson	In Person	GSEC
Pat McCool	In Person	KCPL
Steve Gaw	In Person	Wind Coalition
Tim Soles	In Person	Oxy
Amber Greb	Webex	
Ben Bright	Webex	
Bill Leung (NPRB)	Webex	
Bret Toplyn	Webex	
Brett Hooton	Webex	
Brian Buffington (Xcel)	Webex	
Carrie Simpson	Webex	
ed pfeiffer (quanta)	Webex	
english cook (spp)	Webex	
Eric Burkey (Ameren)	Webex	
Gayle Freier	Webex	
Gimod Olapurayil	Webex	
Heather Starnes (MJMEUC/CU	Webex	
Jason Chaplin (OCC)	Webex	
Jason Shook (GDS/ETEC)	Webex	
Jeremy Harris	Webex	
Jeremy Severson (BEPC)	Webex	
Jerry Bradshaw (SPRM)	Webex	
Jim Krajecki (CES)	Webex	
Jody Holland	Webex	
Joe Fultz	Webex	
Jon Iverson	Webex	
Jon Shipman	Webex	
Jonathan Abebe	Webex	
Josh Verzal	Webex	

Kaustubh Deshmukh	Webex
Kirk Hall	Webex
Lauren	Webex
Leon Howell	Webex
Liam Stringham (Sunflower)	Webex
Liz Gephardt (SPP)	Webex
Lori Frisk-Thompson (BEPC)	Webex
matthew stoltz BEPC	Webex
Michael Watt (OMPA)	Webex
Moses Rotich	Webex
Nikki Roberts	Webex
Noumvi Ghomsi	Webex
Paul Dietz	Webex
Randy Collier (CUS)	Webex
Rosemary Sacris	Webex
Tony Green	Webex

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rmittal@spp.org
tgreen@spp.org

1. **Al Tamimi Proxy to Liam Stringham**

From: Tamimi, Al [mailto:atamimi@sunflower.net]
Sent: Wednesday, July 29, 2015 2:29 PM
To: Kelsey Allen <kallen@spp.org>
Subject: RE: ESWG 7/9 Proxy

Yes Kelsey. LIAM had my PROXY for the 7/9 meeting

2. **Tim Owens proxy to Kurt Stradley**

Kelsey & Alan,

I will be on vacation next week and unable to attend the July 9 ESWG meeting. Kurt Stradley will have my proxy.

Thanks,

Tim

Tim Owens
Resource Planning & Risk
Nebraska Public Power District
Ph: 402-563-5526; FAX: 402-563-5511
E-mail: tjowens@nppd.com

3. **Kip Fox Proxy to Jim Jacoby at 1:00pm**

Please have Jim Jacoby act as my proxy for the ESWG remainder on 7/9. Thank you - Kip

Sent from my iPhone
Kip Fox

972-400-1384 cell

SPP Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

July 9th

8th Floor AEP Offices, Dallas, TX

• AGENDA •

8:00am – 2:00pm

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 .... Kelsey Allen (5 minutes)
3. Transmission Planning Improvement Task Force (TPITF) Update .... Alan Myers (5 minutes)
4. Study Schedules .... Juliano Freitas (15 minutes)
   a. 2017 ITP10[1]
   b. 2015 Regional Review[1]
   c. RCAR II
5. Regional Review Model (Approval Item) .... Brett Hooton (5 minutes)
6. 2017 ITP10 Resource Additions .... All (30 minutes)
   a. Resource Addition Requests (RAR)
   b. Non-Designated Resources
7. RR56 - Upgrade Determination & Short-Term Reliability Project Process[1] ..... Tony Green (30 minutes)
8. MOPC Action Item 255[2] .... SPP Staff (30 minutes)
9. 2017 ITP10 Scope .... SPP Staff (180 minutes)
   a. Data Inputs and Methodology
   b. Futures Assumptions
   c. Portfolio Consolidation Methodology
10. Closing Items .... All (5 minutes)
    a. Summary of Action Items (Kelsey Allen)

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[1] Background Material Included
[2] "Review the method to determine the Cost of Congestion as it relates to Outages for Rebuilds approved"

b. Future Meetings

   i. August 19th – 20th, 2015: Magnolia Hotel, Denver, CO

   ii. September 23rd, 2015: 8th Floor AEP Offices, Dallas, TX

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

Pending Action Items Status Report

July 9th, 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	Complete ESWG Members	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~~Complete Staff	~~Tentatively~~ August 4-5th in Little Rock.
147	ESWG to re-evaluate the modeling issues related to load pockets and wind in the RCAR II.	March 31st, 2015	In Progress ESWG	June 18th: Continue discussion for both a near-term (2017 ITP10) and longer term solution.
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	Staff to give update at July meeting.
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	
153	MOPC action item 255: Review the method to determine the cost of congestion, as it relates to outages for rebuilds approved.	July 9, 2015	In Progress ESWG	SPP Staff to compile comments from the group and develop a "straw man" proposal for discussion

Regional Review Economic Model

Brett Hooton

bhooton@spp.org

SPP Southwest Power Pool

Model Approval

- Model has narrow focus
  - Evaluate the three proposed interregional projects
- Ongoing stakeholder review since June 2
  - Posted on June 2, June 30, & July 2
  - Incorporated applicable 2017 ITP10 updates
  - Limited stakeholder feedback and no stakeholder feedback from July 2 posting

Recommendation: Approve the Regional Review model as posted on July 2.

Timeline

2015 Regional Review	Group(s) to review/endorse	Start Date	Completion Date
Model Refinement	ESWG	June 2015	June 2015
Constraint Review	TWG	June 2015	June 2015
APC Calculation	ESWG	July 2015	July 2015
Other Metrics	ESWG	July 2015	August 2015
40-Year Financial Assessment	ESWG	August 2015	August 2015
No-Harm Reliability Evaluation	TWG	July 2015	August 2015
Analysis Refinement	ESWG	August 2015	September 2015
Project Recommendations	ESWG	September 2015	September 2015
Project Endorsement	MOPC	October 2015	October 2015
Project Approval	BOD	October 2015	October 2015

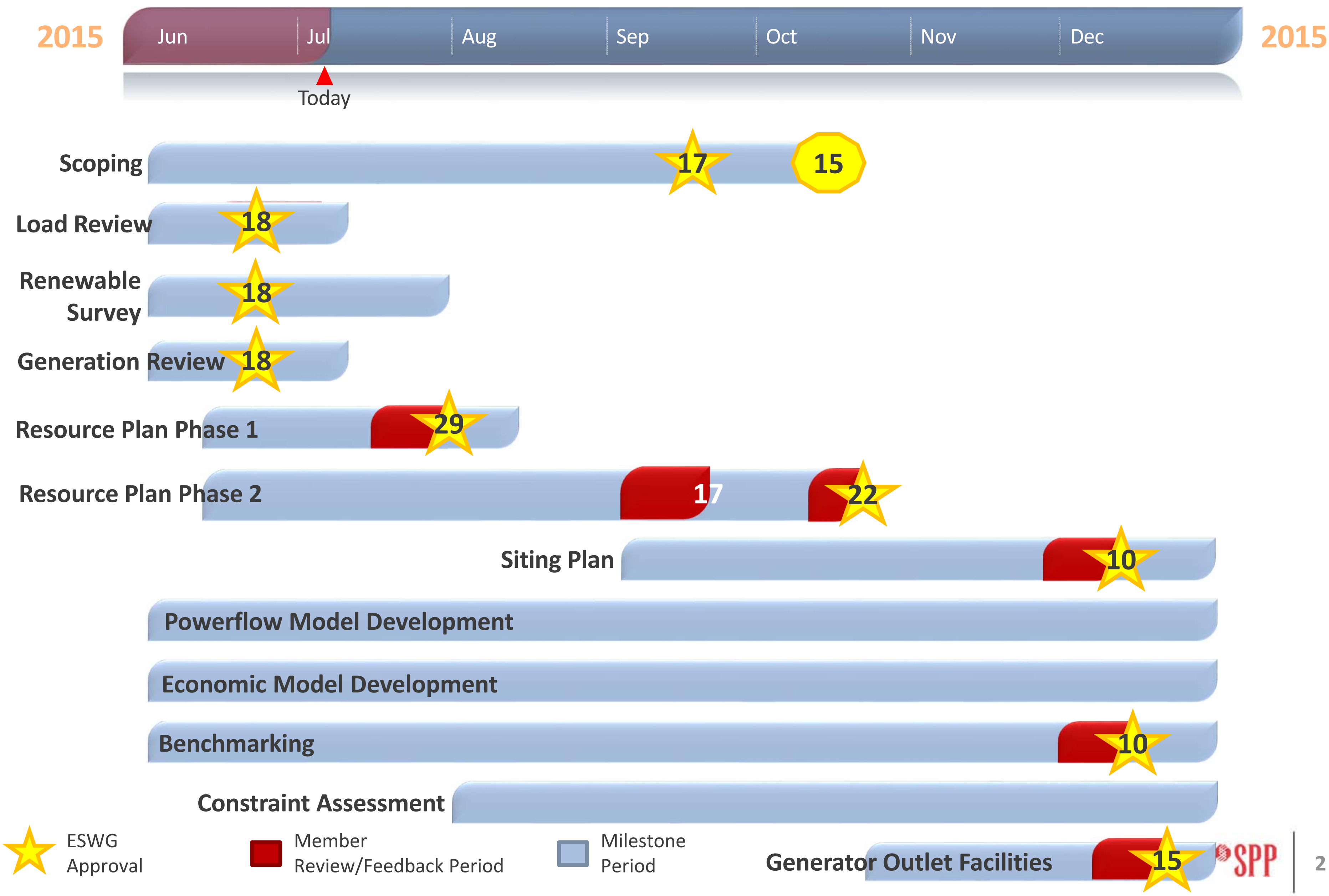
2017 ITP10 Schedule

July 9th, 2015

ESWG

Juliano Freitas

Southwest Power Pool


2015
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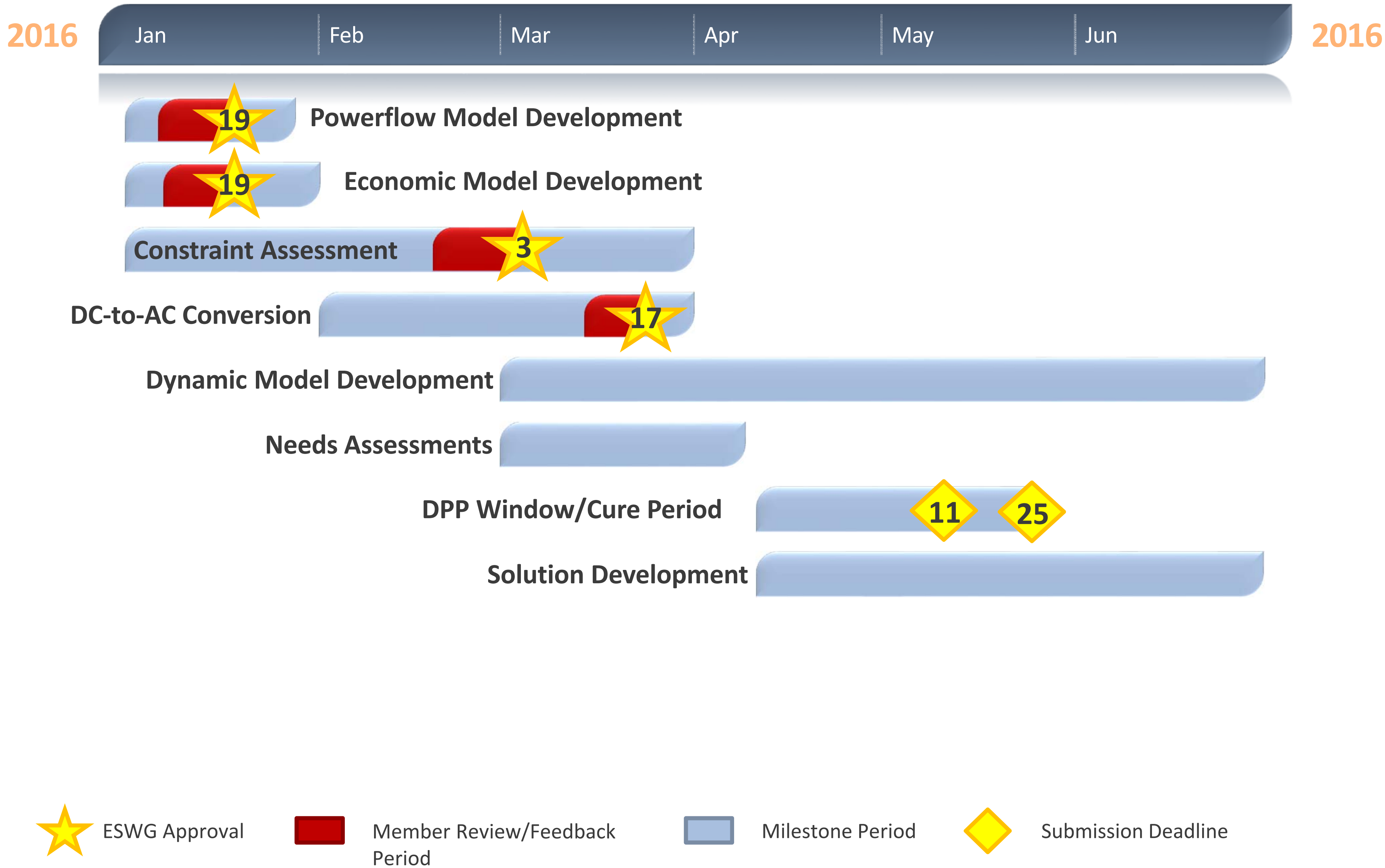
Jul
Aug
Sep
Oct
Nov
Dec
2015
Today
Scoping
17
15
Load Review
18
Renewable Survey
18
Generation Review
18
Resource Plan Phase 1
29
Resource Plan Phase 2
17
22
Siting Plan
10
Powerflow Model Development
Economic Model Development
Benchmarking
10
Constraint Assessment
Generator Outlet Facilities
15
ESWG Approval
Member Review/Feedback Period
Milestone Period



2016
Jan
Feb
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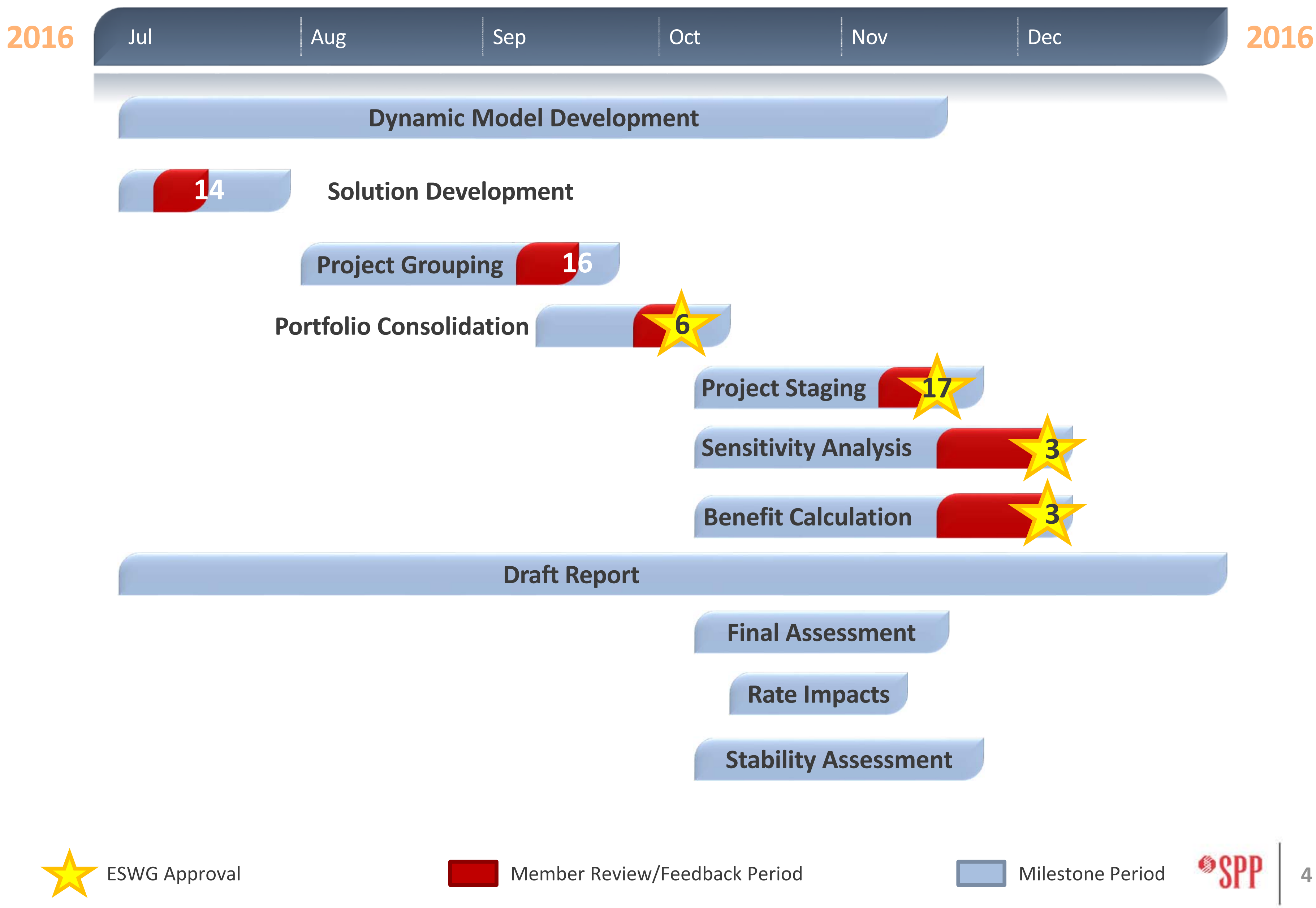
2016
19
Powerflow Model Development
19
Economic Model Development
Constraint Assessment
3
DC-to-AC Conversion
17
Dynamic Model Development
Needs Assessments
DPP Window/Cure Period
11
25
Solution Development
ESWG Approval
Member Review/Feedback Period
Milestone Period
Submission Deadline


2016
Jul
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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**	**March ‘16**	2/22/15 – 2/26/15		February ’16
Generator Outlet Facilities	**October**	**December**	12/1/15 - 12/15/15		12/16/15
DC-to-AC Conversion	**February ‘16**	**March ‘16**	3/10/15 - 3/16/15		March ’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).

SPS RESOURCE ADDITION REQUEST

- 2x70 MW solar facilities in SE New Mexico (Chaves County)
- Facilities Study complete
- E&P Agreements accepted at FERC on July 6, 2015
  - GIAs currently being negotiated
- Facilities are currently in DSIS 2014-002-1
  - Will remain in study
- PPAs completed March 2015
- Application for approval filed at the NMPRC on April 2, 2015
  - Case is on-going
  - Hearing – August 2015

Revision Request Comment Form

RR #: BRR56_BPR066	**Date:** 6/30/15
RR Title: Upgrade Determination and Short-Term Reliability Project Process	
SUBMITTER INFORMATION	
Name: Sherri Maxey	**Company:** SPP
Email: smaxey@spp.org	**Phone:** 501-688-1648
COMMENTS	
(1) Updates to process flowcharts per PCWG feedback and added process flow for Short-Term Reliability Project Process; and (2) Internal SPP staff changes after legal review.	
PROPOSED REVISION	
Provide proposed modifications (redlined) to the revision request for which you are providing comments. Use language from the revision request and redline with your additional edits.	
Market Protocols	

SPP Tariff (OATT)

SPP Criteria

SPP Business Practices

Upgrade Determination and Short-Term Reliability Project Process

Business Practice

This business practice outlines the procedures SPP utilizes to determine which Tariff process is used to select a Transmission Owner ("TO") for upgrades approved by the SPP Board of Directors ("Board~~OD~~") for construction. The three (3) processes utilized include whether an upgrade is: (1) assigned to the incumbent TO, as described in Attachment Y, Section IV; (2) assigned to a Designated Transmission Owner as a Competitive Upgrade using the Transmission Owner Selection Process ("TOSP"), as described in Attachment Y, Section III of the SPP Tariff; or (3) reviewed as a Short-Term Reliability ("STR") Project to determine whether the upgrade is a Competitive Upgrade or is assigned to the incumbent TO, as described in Attachment Y, Section I.3 of the SPP Tariff.

Upgrade Determination

SPP will use the following checklist to determine what process is used in selection of a TO for upgrades, as outlined in Attachment Y, Section I of the SPP Tariff. A transmission upgrade must satisfy all of the following requirements in order to be a Competitive Upgrade:

- Transmission facilities that are an Integrated Transmission Plan ("ITP") upgrade, high priority upgrade, or Interregional Project.
- Transmission facilities that have a nominal operating voltage greater than 100 kV.
- Transmission facilities that are not a Rebuild of an existing facility. Rebuild ~~, a~~is defined in Attachment Y, Section I.2 of the SPP Tariff.
- Transmission facilities that do not alter a TO's use and control of its existing rights-of-way under relevant law or regulations.
- Transmission facilities located where selecting the TO using the TOSP does not violate relevant law.
- Transmission facilities do not include both new and Rebuild portions. If the transmission facilities contain both new and rebuild portions, and the Rebuild cost is less than 80% of the total project cost, SPP ~~staff~~ will divide the new and Rebuild portions into separate segments~~parts~~ for designation of a TO to construct the upgrade~~ determination~~, as shown on Figure 2.
- Transmission facilities that are not a Local Transmission Facility.

For transmission facilities that meet the above requirements and are required to be in service within~~needed in~~ three (3) years or less to address an identified reliability violation, refer to the STR Project Process described below.

Figures 1 and 2 below illustrate the decision points used in determining which of the three (3) processes itemized above will be utilized in determining whether an upgrade is a Competitive Upgrade subject to the TOSP or designated~~assigned~~ to the incumbent TO.

Commented [SM1]: Pending FERC language; Docket No. ER13-1939

Commented [TCK2]: Pending FERC language in Docket No. ER13-366

Figure 1:

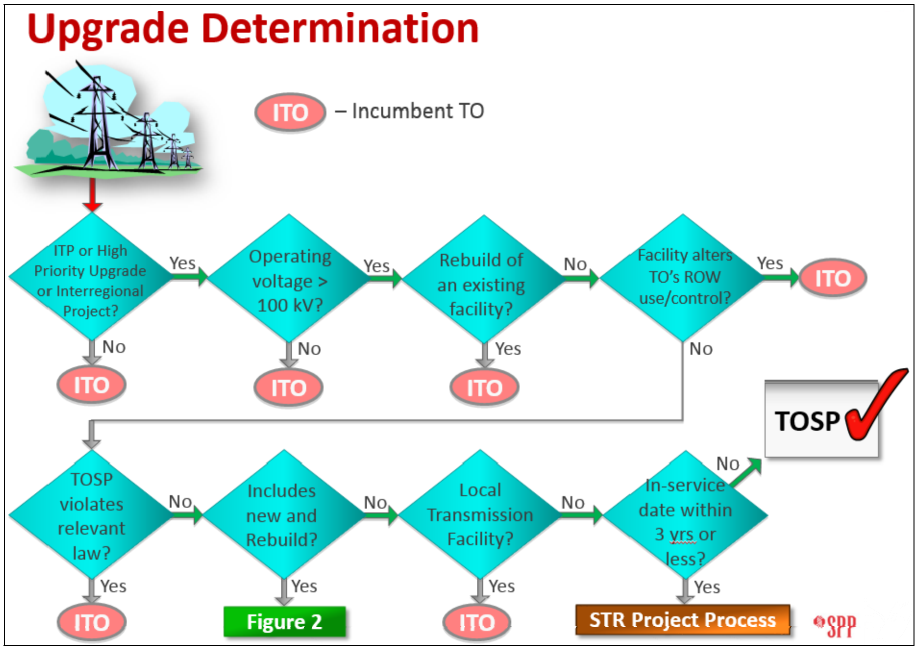
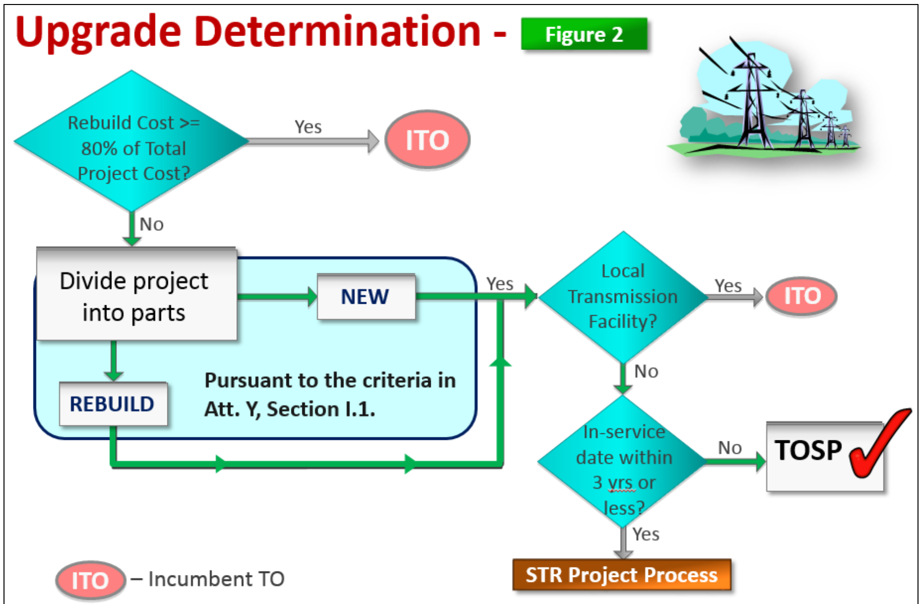
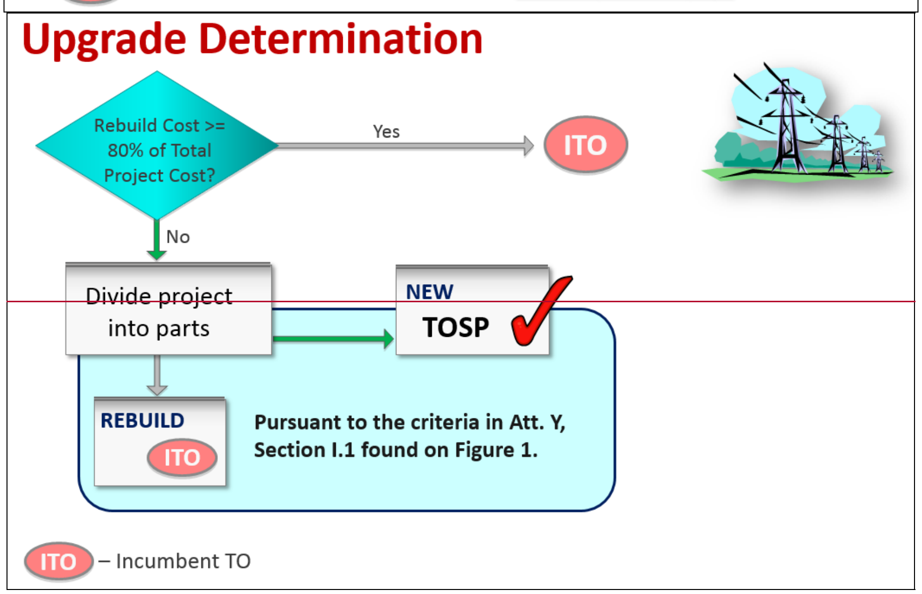


Figure 2:





Designation ~~Assignment~~ to Incumbent TO

If an upgrade does not satisfy the requirements to be a Competitive Upgrade, the upgrade will be ~~assigned~~ designated to the incumbent TO as described in Attachment Y, Section IV of the SPP Tariff, and SPP Business Practice 7060.

~~Assignment~~ Designation Pursuant to TOSP

If an upgrade is determined to be a Competitive Upgrade, the Competitive Upgrade will be ~~assigned~~ designated pursuant to the TOSP as described in Attachment Y, Section III of the SPP Tariff, and SPP Business Practice 7700.

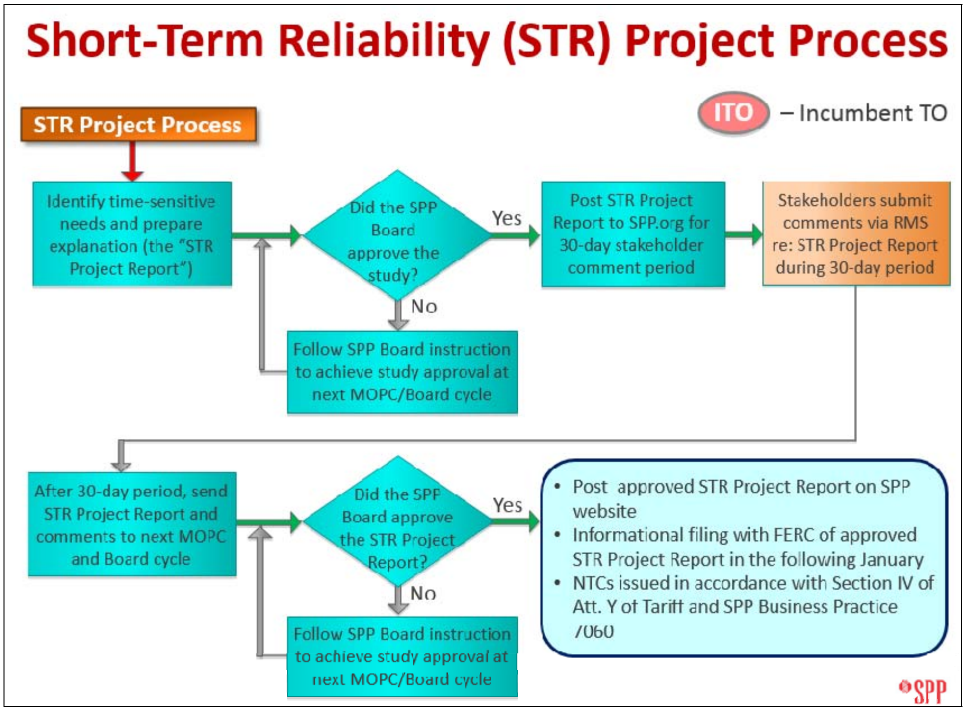
STR Project Process

For any upgrade considered a STR Project, as defined in Attachment Y, Section I of the SPP Tariff, SPP staff will:

- Identify the time-sensitive needs and post an explanation (the "STR Project Report") on the SPP website pursuant to Attachment Y, Section I of the SPP Tariff, once an Integrated Transmission Planning ("ITP") or high priority study report is approved by the Board~~OD~~ to demonstrate why the upgrade(s) are needed within the three (3) year reliability window. Separate notification will be sent via email exploder.
- Once the STR Project Report is posted and notification sent out, stakeholders will have a 30 day period in which to provide comments regarding whether or not the project should be classified as a STR Project. Those comments will be received via RMS, with the instructions provided in the notice posting.
- After the 30-day period, the STR Project Report and comments will be sent to the Market and Operations Policy Committee ("MOPC") and Board~~OD~~ for their review and approval at the next quarterly meeting.
- The approved STR Project Report and comments will be stored on the SPP website.
- The approved STR Project Report will be filed with FERC as an informational filing in the following January.
- If the Board~~OD~~ approves an upgrade as a STR P~~p~~roject, a Notification to Construct ("NTC") will be issued in accordance with Attachment Y, Section IV of the SPP Tariff, and SPP Business Practice 7060.

Figure 3 below illustrates the STR Project Process.

Figure 3:



Competitive Upgrade Transmission Report

The Competitive Upgrade Transmission Report is a report issued by SPP no later than seven (7) calendar days following the approval of one (1) or more Competitive Upgrade by the Board~~OD~~, which shall provide general information regarding the approved Competitive Upgrades.

This report will include the following items (See Figure 3 – Draft Competitive Upgrade Transmission Report):

- Competitive Upgrade description;
- State(s) in which project is to be built;
- Study Name from which Competitive Upgrade was issued;
- Need date(s) from Board~~OD~~-approved study;
- Anticipated financial expenditure date;
- Expected Request for Proposal ("RFP") issue date;
- Expected RFP Response Window; and
- Indication if Competitive Upgrade(s) have an associated Detailed Project Proposal ("DPP").

Figure ~~3~~4:

Competitive Upgrade Transmission Report - January 2015

Upgrade Description	State	Study	Study Need Date	Anticipated Financial Expenditure Date	Latest RFP Issue Date	RFP Response Window	Eligible DPPs?
Sample project #1	KS	2015 ITP10	7/1/2019	7/1/2016	1/1/2015	180 Days	Y

ITP - Integrated Transmission Planning
RFP - Request for Proposal
DPP - Detailed Project Proposal

This report will be posted on the SPP website.

2017 ITP10 Portfolio Consolidation

SPP Staff

July 9th, 2015

Consolidation Methodology

- 2010 ITP20
  - Consolidated plan most resembles the plan from high wind & carbon constraint future
- 2012 ITP10 - Criteria
  - Policy projects: Included if appears in either future
  - Economic projects: Included if B/C > 1.0 in Future 1
  - Reliability projects:
    - Included if the overload exceeded 100% in one future and exceeded 95% in the other future, OR,
    - Included if the voltage violation occurred in both futures.

Consolidation in the 2013 ITP20

- **2013 ITP20 – Weighting**

Portfolio	Weighting	Threshold	Project X	Project Y
Future 1	50%		✓	✗
Future 2	15%		✗	✓
Future 3	10%		✓	✓
Future 4	15%		✗	✓
Future 5	10%		✓	✗
Total	100%		70%	40%
Consolidated		60%	✓	✗

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.

Consolidation Discussion – 6/18

- Develop a methodology flexible enough to allow high value projects from each future
- Develop methodologies to determine 2 sets of projects
  - "no regrets" set of projects
    - Projects that are projected to produce value independent of what happens in the future
  - "value" set of projects
    - Projects that produce value within the context of the study
- Is F3 just a base case to compare to? (not weighted)
- MISO methodology
  - % weighting per future
  - Project selection based on product of performance and weighting summed across all futures

2017 ITP10 Data Inputs & Study Methodology

SPP Staff

July 9th, 2015

Southwest Power Pool

Data Inputs & Study Methodology

- Load & Gen Review
- Renewable Survey
- System Topology
- Fuel Prices
- Emissions Prices
- DC Ties
- Hourly Load Profiles
- Hourly Renewable Profiles
- Resource Plan
  - Capacity accreditation
  - Capacity margin
- Needs Assessments (Economic & Policy)

*Complete Discussing Today Reference

Approved Assumptions

- Status quo hourly load profiles
- Maintain a 13.6% reserve margin for resource planning (As currently outlined in SPP criteria)
- Use actual calculated values for accreditation of wind resources with 3 years of historical data and follow SPP criteria for accreditation of future wind resources
- Follow SPP criteria for accreditation of solar resources

Approved Assumptions

- Utilize the status quo methodology for modeling of fuel, wind, and emissions prices. (Ventyx Reference Case for coal, oil, uranium and emissions prices. NYMEX futures and DOE growth rates for natural gas prices. $8/MWh VOM and curtailment price for wind)
- Remove PROMOD must run flag on all base load units except nuclear for all futures

Approved Assumptions

- Approved the use of new “Other GI Firm” resources [not designated to a utility] to meet any potential renewable Mandate or Goal shortfalls
- Approved the use of prototypes from Lazard’s 2014 Levelized Cost of Energy Study (Version 8)
- Approved the use of 2012 hourly wind profiles from the NREL 2012 WIND toolkit dataset

Other Assumptions Discussed

- **Wind capacity factors for Phase 1 Resource Plan (Policy driven additions)**
  - **Utilize Regional, State, Zonal, or bus information provided for siting considerations in renewable survey**
    - **Use average of SPP capacity factors for each siting consideration type (existing modeled wind, NREL data)**
    - **Site specific NREL data for supplied bus level data**

Approved Assumptions

- Approved to define up to 25 congested constraints with greater than $50,000 in annual congestion cost as economic needs
- Approved the status quo methodology for identifying policy needs
  - Shortfall of deliverable energy mandates or goals by utility, by state

Data Inputs & Study Methodology

- Benchmarking
- Conventional minimum capacity
- Resource plan
  - Prototypes
- Siting
- Generator Outlet Facilities
- Constraint Assessment
- Project Selection
- Project Grouping
- Portfolio Consolidation
- Project Staging
- Benefit Metrics
- Sensitivities

*Complete Discussing Today Reference

Benchmarking

- Benchmarking used to help evaluate reasonableness of Study Year Model
  - Generation
    - Capacity Factor by Unit Type
    - Operating & Spinning Reserves
    - Generator Outage Rates
    - Average Plant Costs by Unit Type
  - System LMPs
  - Interchange
- Hurdle Rates being the major output of Benchmarking

Reasonableness of Benchmarking

- Can we benchmark the Study Year model?
- Do we need to revisit hurdle rates from the last ITP10?
- Do we need to revisit hurdle rates via the traditional Benchmarking methodology?
- Can it be done in a more efficient manner?

Benchmarking Option 1

- Focus Benchmarking efforts toward quality assurance and validation of the study year economic model
- Use 2015 ITP10 Hurdle Rates or new hurdle rate methodology
- Use one set of hurdle rates from SPP to all regions
- Omit 2014 Economic Model build

Benchmarking Option 2

- Utilize historic year for Benchmarking
- Determine one set of hurdle rates from SPP to neighboring regions
  - Aggregated data is available for one set of rates
  - Tie line information may have gaps if reevaluating individual region rates

Benchmarking Staff Recommendation

Staff recommends to implement Option 1 using a new hurdle rate methodology.

Conventional Machine Minimum Capacity

- Not surveyed as a part of the generation review
- Discuss reduction of minimum capacity for base load units CPP Futures (or all futures)

2017 ITP10 Data Inputs

LAZARD GENERATION PROTOTYPES

Generation Prototype Data

- June 3rd ESWG
  - Group approved use of Lazard LCOE Analysis v8.0 for generation prototype parameters in the 2017 ITP10 resource plan
  - Lazard data provides ranges of data for some parameters, such as capital costs, O&M, etc.
- Today
  - Address how to select data within these ranges

Lazard Prototype Data

Generation Type	Size (MW)	Total Capital Cost ($/kW)	V O&M ($/MWh)	F O&M ($/kW-yr)	Heat Rate (Btu/kWh)
Combined Cycle (CC)	550	1,006-1,318	3.50-2.00	6.20-5.50	6,700-6,900
Combustion Turbine (CT)	216-103	800-1,000	4.70-7.50	5.00-25.00	10,300-9,000
Coal	600	3,000-8,400	2.00-5.00	40.00-80.00	8,750-12,000
Nuclear	1,100	5,385-8,199	0.25-0.75	95.00-115.00	10,450
Wind	100	1,400-1,800	0.00	35.00-40.00	N/A
Solar PV (Utility Scale)	10	1,750-1,500	0.00	20.00-13.00	N/A

Reasons Lazard provides ranges of values

- Differing technology assumptions regarding:
  - Renewable units and capacity factors
  - Carbon capture & sequestration (CCS) for Coal
- Location-specific cost variances
- Differing CT capacities result in different costs
- Other ranges (such as nuclear parameters) do not have an explanation

Wind Prototype

	Units	Wind
Net Facility Output	MW	100
EPC Cost	$/kW	$1,100 – $1,400
Capital Cost During Construction	$/kW	included
Other Owner's Costs	$/kW	$300 – $400
Total Capital Cost[a]	$/kW	$1,400 – $1,800
Fixed O&M	$/kW-yr	$35.00 – $40.00
Variable O&M	$/MWh	—
Heat Rate	Btu/kWh	—
Capacity Factor	%	52% – 30%
Fuel Price	$/MMBtu	—
Construction Time	Months	12
Facility Life	Years	20
CO_2 Emissions	lb/MMBtu	—
Investment Tax Credit[b]	%	—
Production Tax Credit[b]	$/MWh	—
Levelized Cost of Energy[b]	$/MWh	$37 – $81

- Staff recommends use of the low-end costs of wind, for Total Capital Cost and Fixed O&M
- More indicative of wind capability in SPP, as we expect capacity factors of ~50% in the 2017 ITP10

CT Prototype

	Units	Gas Peaking
Net Facility Output	MW	216 – 103
EPC Cost	$/kW	$580 – $700
Capital Cost During Construction	$/kW	included
Other Owner's Costs	$/kW	$220 – $300
Total Capital Cost[a]	$/kW	$800 – $1,000
Fixed O&M	$/kW-yr	$5.00 – $25.00
Variable O&M	$/MWh	$4.70 – $7.50
Heat Rate	Btu/kWh	10,300 – 9,000
Capacity Factor	%	10%
Fuel Price	$/MMBtu	$4.50
Construction Time	Months	25
Facility Life	Years	20
CO_2 Emissions	lb/MMBtu	117
Investment Tax Credit[b]	%	—
Production Tax Credit[b]	$/MWh	—
Levelized Cost of Energy[b]	$/MWh	$179 – $230

- **Low-end costs represent 216 MW unit, high-end costs represent 103 MW unit**
- **Staff recommends use of <u>both the high-end 103 MW prototype and the low-end 216 MW prototype</u>**
- **High-end cost units in-line with max caps of other CT units in SPP**
- **Low-end cost units in-line with upward direction of CT size in GI queue**

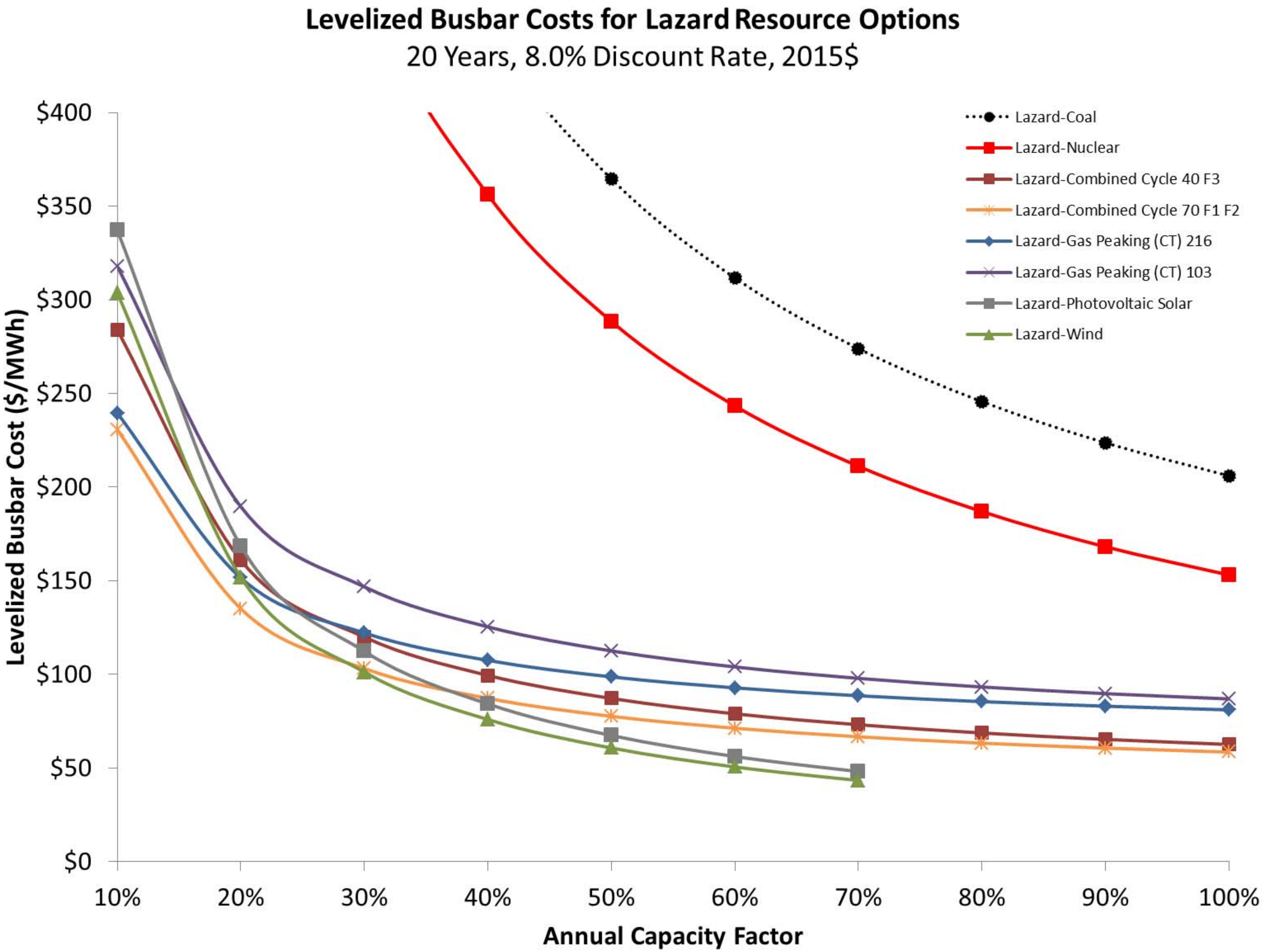
CC Prototype

	Units	Gas Combined Cycle
Net Facility Output	MW	550
EPC Cost	$/kW	$743 – $1,004
Capital Cost During Construction	$/kW	$107 – $145
Other Owner's Costs	$/kW	$156 – $170
Total Capital Cost[a]	$/kW	$1,006 – $1,318
Fixed O&M	$/kW-yr	$6.20 – $5.50
Variable O&M	$/MWh	$3.50 – $2.00
Heat Rate	Btu/kWh	6,700 – 6,900
Capacity Factor	%	70% – 40%
Fuel Price	$/MMBtu	$4.50
Construction Time	Months	36
Facility Life	Years	20
CO_2 Emissions	lb/MMBtu	117
Investment Tax Credit[b]	%	—
Production Tax Credit[b]	$/MWh	—
Levelized Cost of Energy[b]	$/MWh	$61 – $87

- **Low-end cost parameters based on 70% CF**
- **High-end cost parameters based on 40% CF**
- **Staff recommends the <u>high-end cost parameters for F1 & F2</u>, and the <u>low-end cost parameters for F3</u>**

Other Prototypes – Recommendations

- Coal – No Prototype
  - Due to expected carbon restrictions
- Solar – Use low-end of the cost ranges
  - Low-end costs represent single-axis tracking, 30% CF
  - High-end costs represent fixed-tilt installation, 21% CF
- Nuclear – Use mid-point of the ranges
  - No documented reasons for ranges of costs; assume the average



Levelized Busbar Costs for Lazard Resource Options
20 Years, 8.0% Discount Rate, 2015$
Levelized Busbar Cost ($/MWh)
$400
$350
$300
$250
$200
$150
$100
$50
$0
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Annual Capacity Factor
Lazard-Coal
Lazard-Nuclear
Lazard-Combined Cycle 40 F3
Lazard-Combined Cycle 70 F1 F2
Lazard-Gas Peaking (CT) 216
Lazard-Gas Peaking (CT) 103
Lazard-Photovoltaic Solar
Lazard-Wind

Recommendation

- Staff recommends ESWG approve the use of the following values for Lazard prototypes:
  - Wind: Low-end cost parameters
  - CT: High- and Low-end prototypes
  - CC
    - Futures 1 & 2: Low-end costs based on 70% CF
    - Future 3: High-end costs based on 40% CF
  - Coal: No prototype
  - Solar: Low-end cost parameters
  - Nuclear: Mid-point of parameters

Solution Development Recommendation

- Solicit stakeholders for solutions for all identified needs
- Policy projects: mitigate renewable curtailment to meet the regulatory/statutory mandates and goals
- Economic projects: B/C > .75 for one year
- Seams projects
  - Identified based on benefits to other regions
  - 80/20 cost sharing

Economic Project B/C Threshold

- 2015 ITP10 consolidated portfolio
  - APC only B/C was 3.05
  - Total benefit metric B/C was 4.1
  - Additional benefits increased B/C by 34%
- 2015 ITP10 consolidated portfolio individual projects
  - No consistent correlation between 1-year and 40-year B/C
  - Dependent on the staging year and need date
  - Many 40-year B/C's saw a decrease over the 1-year B/C

Economic B/C threshold recommendation

- Staff recommends setting an APC based 1-year individual project B/C threshold > 0.6 to pass phase 1 screening
- Staff recommends setting an APC based 1-year individual project B/C threshold > 0.8 for inclusion in a final portfolio

Phase 1 – Individual Project Testing Recommendation

- 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.
    - Policy Projects must allow the utilities to meet the regulatory/statutory mandates and goals.

Project Grouping Methodology Recommendation

- Reliability, policy, and economic projects will be combined into project groupings for each future and evaluated for redundancies
- Project groupings will be developed considering:
  - Project’s Phase 1 performance
  - 70% congestion relief per need to address locality of constraint and solution
- Groupings per Future:
  - Cost Effective
  - Highest Gross APC benefit
  - Highest Net APC benefit
  - Multi-Variable Grouping

Phase 2 – Combined Project Testing Recommendation

- **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 (Optional) –** Allows SPP staff to layer multiple criteria. The experience gained from analyzing projects for the first three groups will be utilized to determine projects

Project Staging Criteria

- 2010 ITP20 and 2013 ITP20
  - All projects staged for year 20
- 2012 ITP10 Economic Projects
  - B/C ratios interpolated between 5 years out & 10 years out to identify when it exceeds 1.0 in Future 1
- 2012 ITP10 Policy Project
  - Staged for 5 years out due to the 5 years out renewable goals from renewable survey

Project Staging Criteria – 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

Project Staging Recommendation

- Staff recommends utilizing the 2015 ITP10 project staging methodology

Benefit Metrics

Metric Description
APC Savings
Avoided or Delayed Reliability Projects
Marginal Energy Losses
Reduced Capacity Costs Due to Reduction of On Peak Losses
Increased Wheeling Through and Out Revenues
Public Policy Benefits
Assumed Benefit of Mandated Reliability Projects
Mitigation of Transmission Outage Costs

Benefit Metrics

- Recommendation
  - Calculate 8 approved benefit metrics on the final consolidated portfolio in Future 3

Sensitivities

- In the 2015 ITP10 (BAU Future)
  - Natural Gas Price
  - Demand Levels
  - Tres Amigas and Clean Line Plains & Eastern
  - Increased Input Prices
- Recommendation
  - Perform Natural Gas Price and Demand Levels sensitivities on final consolidated portfolio in Future 3