Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

October 12, 2017
8th Floor AEP Offices – Dallas, TX

• Summary of Action Items •

1. Approved the minutes from the September 13-14th, 2017 meeting in Dallas.
2. Approved the individual project review option. (For Consolidation)
3. Approved to review the Transmission Outages benefit metric by leveraging RCAR II analysis with the RCAR II models.

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

October 12, 2017

8th Floor AEP Offices – Dallas, TX

• M I N U T E S •

Agenda Item 1 – Administrative Items

Agenda Item 1a - Call to Order, Introductions

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

There were 20 in-person participants and 51 web conference participants, representing 16 of 17 ESWG members. (Attachment 1 – October 12, 2017 Attendance List)

Agenda Item 1b – Receipt of Proxies

Alan Myers (ITC) asked for any proxy statements; Jody Holland (SCMCN) named Eric Burkey (SCMCN) as his proxy.

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 – October 12th, 2017 ESWG Agenda).
Chris Jamieson (SPP) adjusted Agenda item #8 name from "Non-Firm Generation Modeling" to "Adjusted Production Cost Calculations."

> **Kurt Stradley (LES) made a motion; seconded by Jon Iverson (OPPD) to adopt the agenda as amended. The motion was approved unanimously.**

Agenda Item 2 – Review of Past Action Items

Juliano Freitas (SPP Staff) reviewed the list of past action items and asked for any comments or questions.

Agenda Item 3 – Consent Agenda

The consent agenda included the following items:

> Meetings Minutes – September 13th - 14th, 2017 (Attachment 5 – September 13-14th, 2017 ESWG Minutes)

Alan Myers (ITC Great Plains) asked if any items should be removed from the consent agenda.

The minutes were pulled off the consent agenda for grammatical issues and the adjustments were made during the meeting.

> **Jon Iverson (OPPD) made a motion; seconded by Kurt Stradley (LES) to approve the September 13-14th ESWG meeting minutes as amended. The motion was approved with one abstention, Brad Schwarz (Hunt)**.

Agenda Item 4 – Renewable Pricing

Chris Jamieson (SPP) presented on Renewable Pricing, this topic is related to action item 187 "Address the objections raised to the approved renewable VOM modeling detailed in the ITP manual." Staff restated stakeholder concerns. Chris showed a comparison of different implementation methods, providing an example for Base Case, Change Case, and the impact to APC Benefit. Alan Myers (ITC) asked the group if anyone has an issue with $-35 curtailment price, there were no issues. Alan conducted a straw poll to determine if the group should bring the language back for continued discussion or inform MOPC that no further discussion is needed. The group voted for continued discussion on this topic. Natasha Henderson (GSEC) requested staff to provide historical PPA trends. Steve Gaw (Wind Coalition) requested staff provide data on a more regional basis. Steve requested staff review other RTO's calculations and reasoning for their methodology. Al Tamimi (SUNC) requested staff apply a $0 VOM to the 2017 ITP models to see the effects on the portfolio. Alan asked staff to have data by the December meeting to take to MOPC in January of 2019. (Attachment 4 - Renewable Pricing)

Agenda Item 5 – 2019 ITP Schedule

Juliano Freitas (SPP) informed the ESWG that a final schedule for the 2019 ITP will be provided in November, due to near term issues. Juliano also informed the group that he is working on the cost estimate period. The group expressed issues with the cost estimates time frame. (Attachment 5 – 209 ITP Schedule)

Agenda Item 6 – 2019 ITP Load and Generation Review

Nikki Roberts (SPP) provided an update on Load and Generation Review. Nikki reminded everyone of the dates for the 2nd pass of the Load and Generation review. Staff provided a process overview for the RAR/Wavier requests. The group requested the full list of RAR/Wavier requests to review. (Attachment 6 - 2019 ITP Load and Generation Review)

Agenda Item 7 – 2019 ITP Scope Items

Agenda Item 7a – Operational Project Evaluation

Will Tootle (SPP) provided language for Economic Operational Needs Solution Evaluation and Reliability Operational Needs Solution Evaluation. Will discussed the evaluation process for economic and reliability needs. The group discussed changes to the language and advised staff to make the necessary adjustments. (Attachment 7 - Operational Project Evaluation)

Agenda Item 7b – Consolidation

Chris Jamieson (SPP) reviewed a presentation on the 2019 ITP Portfolio Consolidation. Staff reviewed consolidation methodologies used in previous studies. Three consolidation options were presented for the discussion. The group expressed concerns with approving consolidation this early in the process. Natasha Henderson (GSEC) suggested waiting until futures are more defined. Juliano Freitas (SPP) mentioned that by waiting for consolidation approval, it would result in additional meetings later in the process and also delay in the schedule due to the diversity of opinions in how we should consolidate the portfolios. Tim Owens (NPPD) suggested adding in the scope; consolidation will be set later in the schedule. Jason Davis (SPP) advised the group by approving consolidation would help with planning and setting the schedule. The discussion continued on how each of the options would work. (Attachment 8 - Consolidation)

John Olsen (Westar) made a motion; seconded by Natasha Henderson (GSEC) to approve the individual project review option. The motion was approved with three abstentions, Kurt Stradley (LES), Tim Owens (NPPD), and Jon Iverson (OPPD)

Kurt Stradley (LES) abstained on the vote to use the Individual Project Review option for portfolio consolidation in the 2019 ITP assessment because the final details on how this would be applied have not been worked out or vetted. We felt it was too early in the discussion of the options to make this decision without weighting everything out.

Tim Owens (NPPD) abstained on the vote regarding use of the Individual Project Review option for portfolio consolidation in the 2019 ITP assessment, primarily because it has not yet been developed sufficiently for us to evaluate how it will actually be applied in the assessment. We

are not opposed to continued discussion of the approach, but felt the motion to pursue this option for the 2019 ITP was premature.

Action item: SPP staff create language for individual project review option for consolidation.

Agenda Item 7c – Sensitivities

Clayton Mayfield (SPP Staff) presented on Sensitivities for the 2019 ITP. Staff proposed 3 sensitivities in addition to 4 required by the ITP manual. Staff informed ESWG that the schedule potentially only allowed for up to 2 of the 3 sensitivities to be included. For the 4 required sensitivities staff brought two optional methods for evaluating the sensitivities. ESWG suggested bringing back a side by side comparison of vendor data and Henry Hub gas prices for the November ESWG meeting to help inform a gas sensitivity decision. ESWG also requested for staff to research the vendor gas price methodology and methods for the basis price in forecasting. It was suggested that staff should provide an additional option for the load sensitivity option 2. Stakeholders decided not to pursue a must-run type sensitivity, they felt it did not provide much value. ESWG did not understand the other two non-required sensitivities due to wording and requested clarification for the November ESWG. (Attachment 9 - Sensitivities)

Agenda Item 8 – Adjusted Production Cost Calculations

Kelsey Allen (SPP Staff) reviewed a presentation on Adjusted Production Cost Calculations, modeling of resources and their relation to transmission service. The presentation attempted to draw correlations of potential APC benefits to the cost allocation of transmission to SPP ratepayers. Kelsey provided potential alternative approaches to modeling and benefit calculations to address members concerns related to non-firm resources. This item is related to the motion approved on October 4th, for total Wind Generation in both the Reference Case and for Future 2, with consideration of staffs proposed mitigation options to be discussed in the future. (Attachment 10 - Adjusted Production Cost Calculations)

Agenda Item 9 – 2018 ESWG Meeting Schedule

Juliano Freitas (SPP Staff) reviewed 2018 ESWG Meeting Schedule. (Attachment 11 – 2018 ESWG Meeting Schedule)

Agenda Item 10 – Siting Manual Action Plan

[This item was not covered in the allotted time]

Agenda Item 11 – Transmission Outage Metric

Antonio Barber (SPP) reviewed a proposal for evaluation of Transmission Outage Metric percentage. Antonio presented two options for conducting the evaluation. (Attachment 12 - Transmission Outage Metric)

Leon Howell (OGE) made a motion; seconded by Tim Owens (NPPD) to approve leveraging the work from RCAR II analysis on the RCAR II models to continue the evaluation of the Mitigation of Transmission Outages benefit metric. The Motion was approved unanimously.

Action Item: SPP staff to perform a full transmission outage analysis before the next RCAR.

Agenda Item 12 – GlobalScape Migration

Antonio Barber (SPP) presented on the migration from Trushare to GlobalScape. Antonio informed the group of the expectations and time frame for the migration. (Attachment 13 – GlobalScape Migration)

Closing Items

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

List of action items from the meeting:

1. SPP staff to perform a full transmission outage analysis before the next RCAR.
2. SPP staff create language for individual project review option for consolidation.

The meeting was adjourned at 2:59 PM.

Respectfully Submitted,
Amber Greb
ESWG Secretary

SPP Southwest Power Pool

Southwest Power Pool, Inc.

ECONOMIC STUDIES WORKING GROUP MEETING

October 12, 2017

AEP Office – Dallas, TX

• ATTENDANCE LIST •

Name	Company
Tim Owens	NPPD
Leon Howell	OGE
Alan Myers	ITC
JULIANO FREITAS	SPP
KURT STRUDLEY	LES
Michael Wegner	ITC
Brad Schwarz	Hunt Transmission
Steve Gaw	Wind Coalition
Anita Sharma	AEP
Tom Jacoby	AEP
John Olsen	Westar
Natasha Henderson	OSEC
Ryan Yokley	Sunflower
Calvin Daniels	WFEC
DON FRERKING	KCP&L
Meena Thomas	Texas PUC
Chris Jamison	SPP
WAYNE PENROD	Sunflower Electric
Eric Burkey	South Central MCN
Antonio Barber	SPP

Name	Email	
Alan Meyers	ITC	In Person
Anita Sharma	AEP	In Person
Antonio Barber	SPP	In Person
Brad Schwarz	Hunt	In Person
Calvin Daniels	WFEC	In Person
Chris Jamieson	SPP	In Person
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Eric Burkey	SCMCN	In Person
Jim Jacoby	AEP	In Person
John Olsen	Westar	In Person
Juliano Freitas	SPP	In Person
Kurt Stradley	LES	In Person
Leon Howell	OGE	In Person
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Natasha Henderson	GSEC	In Person
Ryan Yokley	SUNC	In Person
Steve Gaw	Wind Coalition	In Person
Tim Owens	NPPD	In Person
Wayne Penrod	SUNC	In Person
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Vince Vandaveer (SPRM)	vince.vandaveer@cityutilities.net	Webex
Will Tootle	wtootle@spp.org	Webex
Zac hager	hagerzc@oge.com	Webex

I'm providing my proxy to Eric for today's ESWG meeting. Thanks.

Jody Holland
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Midcontinent MCN, LLC
MidAtlantic MCN, LLC
Gridliance West Transco, LLC
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ECONOMIC STUDIES WORKING GROUP

October 12th, 2017

8th Floor AEP Offices – Dallas, TX

• A G E N D A •

1. Administrative Items
    a. Call to Order, Introductions ..... Alan Myers (5 minutes)
    b. Receipt of Proxies ..... Juliano Freitas (1 minute)
    c. Review of Agenda[1] ..... Alan Myers (1 minute)
2. Review of Past Action Items[1] ..... Juliano Freitas (15 minutes)
3. Consent Agenda ..... Alan Myers (1 minute)
    a. Meeting Minutes – September 13-14th, 2017
4. Renewable Pricing[1] ..... Chris Jamieson (45 minutes)
5. 2019 ITP Schedule[1] ..... Juliano Freitas (5 minutes)
6. 2019 ITP Load and Generation Review[1] ..... Nikki Roberts (15 minutes)
    a. Resource Addition Request
7. 2019 ITP Scope Items[1] ..... SPP Staff (120 minutes)
    a. Operational Project Evaluation[1] (Approval Item) (Will Tootle) ..... (30 minutes)
    b. Consolidation[1] (Chris Jamieson) ..... (30 Minutes)
    c. Sensitivities[1] (Clayton Mayfield) ..... (30 minutes)
8. Adjusted Production Cost Calculations [1] ..... Kelsey Allen (60 minutes)
9. 2018 ESWG Meeting Schedule[1] ..... All (15 minutes)
10. Siting Manual Action Plan[1] ..... Chris Jamieson (30 Minutes)
11. Transmission Outage Metric[1] (Approval Item) ..... Antonio Barber (30 minutes)
12. GlobalScape Migration[1] ..... Antonio Barber (15 minutes)

[1] Background Material Included

13. Closing Items ..... All (5 minutes)

a. Summary of Action Items (Juliano Freitas)

b. Future Meetings

i. November 8th-9th, 2017: SPP Corporate Offices, Little Rock, AR

ii. November 16th, 2017: Potential Conference Call

iii. November 30th, 2017: Potential Conference Call

iv. December 14th, 2017: 8th Floor AEP Offices, Dallas, TX

v. January 11th, 2018: 8th or 41st Floor AEP Office, Dallas, TX


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ITP Renewable Pricing

SPP Staff

October 12, 2017

ITP Manual Language

2.2.1.10 Renewable Pricing

- Two primary parameters that impact renewable pricing in vendor software:
  - Curtailment price (Bid Price) – Ranging from Negative $35/MWh to $0/MWh
    - Defines LMP price at which the resource will be curtailed
    - Impacts LMPs, curtailment, and dispatch
    - Including range is intended to improve market operation modeling
  - VOM (Energy Cost to Load) – Ranging from Weighted Average of Fixed-Contract Prices $/MWh to $8/MWh
    - Does not impact LMPs, curtailment, and dispatch
    - Defines unit energy cost for production cost calculation
    - May Improve valuing the benefit of intermittent energy resources to load when comparing to the transmission cost of delivering these energy supplies (Philosophy)

Stakeholder Concerns

- Methodology may cause data gathering issues and inconsistency
- Methodology may not be representative of operating cost by definition
- Methodology may not be representative of real-time operations and settlements
- Methodology may be inconsistent
  - Utility owned versus merchant owned
  - Conventional versus renewable
- Reflecting PPA pricing in a renewable unit's cost may reduce the APC benefit of transmission investment to deliver existing and forecasted renewables

Economic Model Implementation Comparison to an Example PPA for Discussion Purposes

	Model Implementation		Example PPA Settlement
	ITP Manual 1.0	ITP Manual 2.0	Take or Pay Contract
Base Case	$40	$40	$40+$25*
Change Case (Add Transmission)	$8	$25	$25
APC Benefit (Change minus Base)	$32	$15	$40
	Benefit	Lower Benefit	Higher Benefit

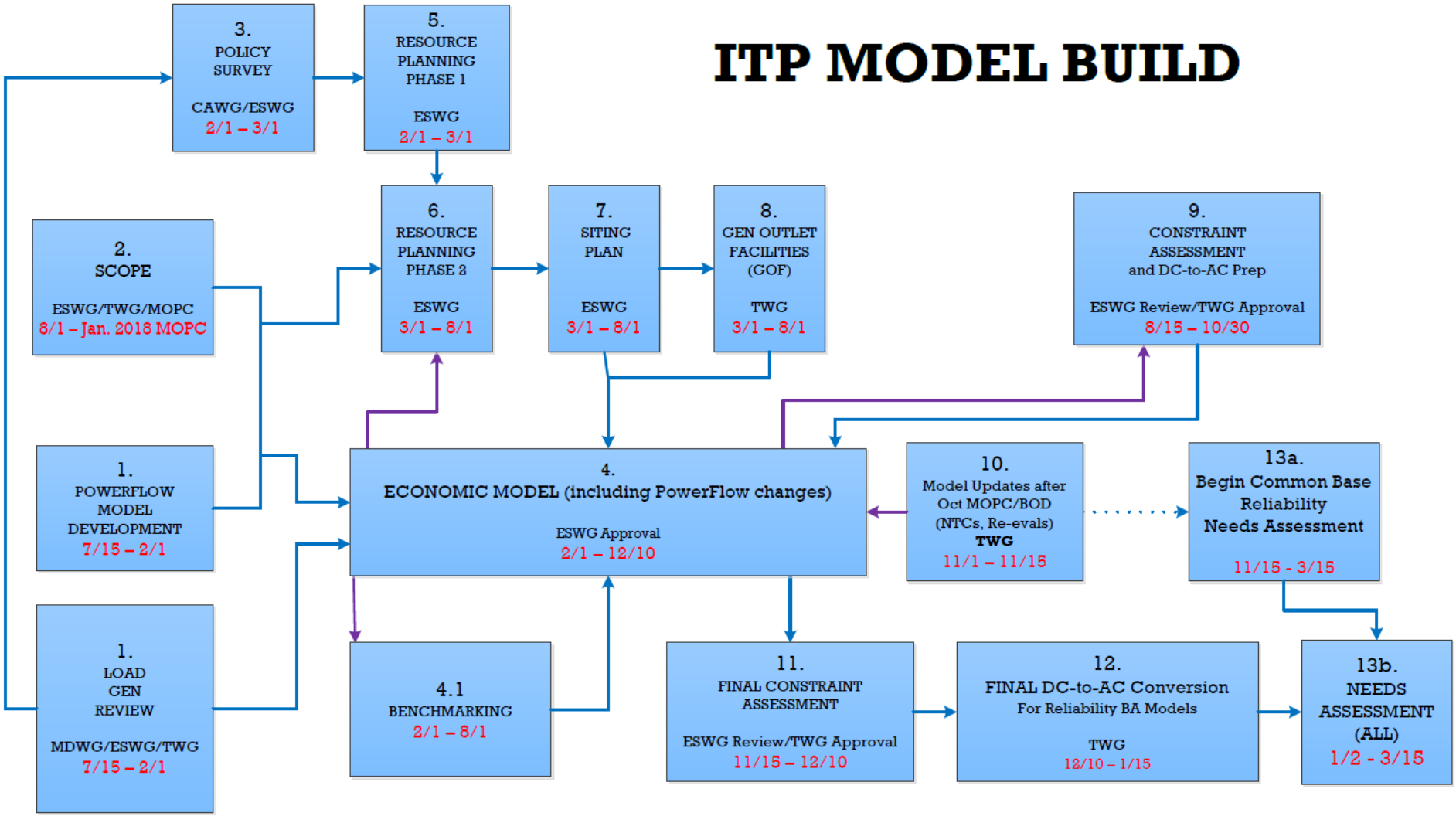
*PPA cost included during economic curtailment due to take or pay contract

Mitigation

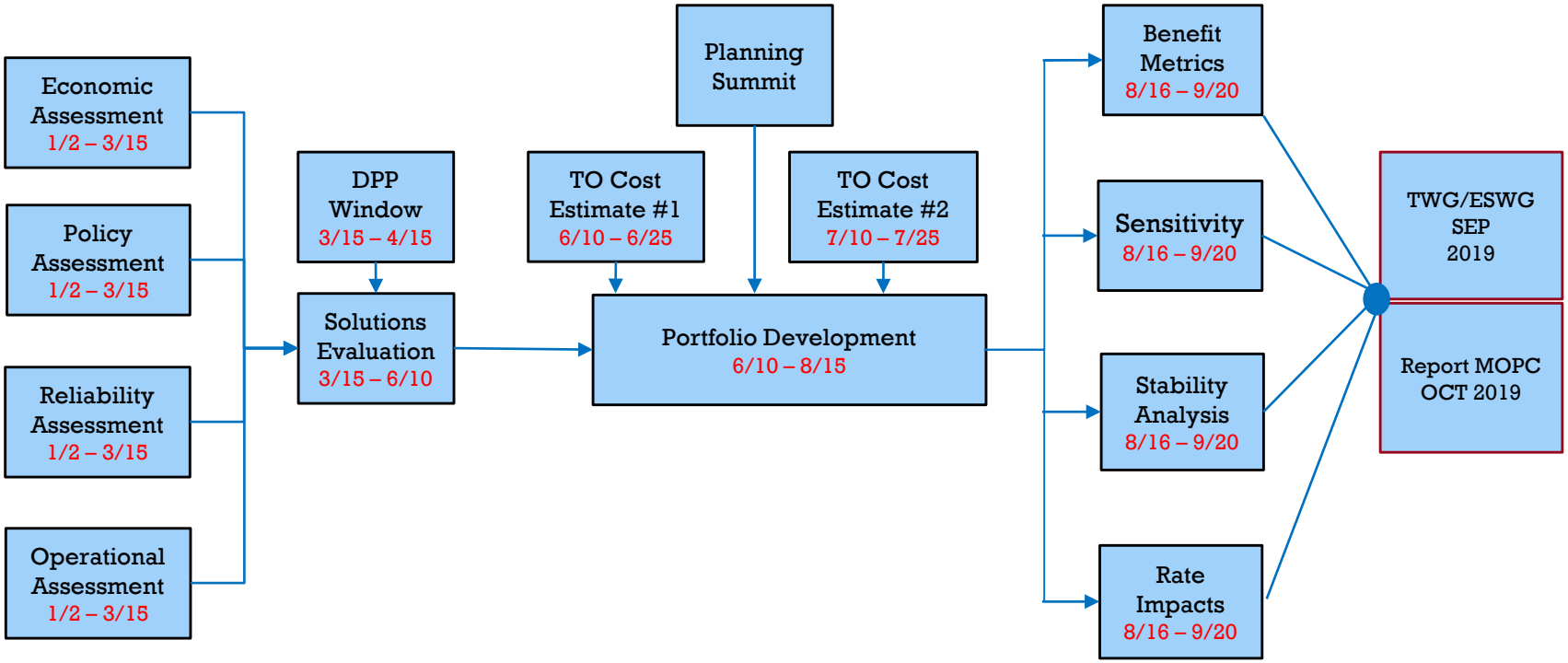
- Options
  - Keep Curtailment and VOM price approach the same and address each stakeholder concern
  - Keep Curtailment the same and change VOM
- Considerations
  - What do we do with the curtailment and VOM price for external solar and wind resources for modeling consistency?
  - Industry Standard for Solar and Wind VOM
    - ABB, MISO, PJM
      - Uses $0/MWh for solar and wind VOM
    - EIA, NREL, Lazard show fixed cost and zero variable cost
  - Industry Standard for Solar and Wind Curtailment Price
    - ABB has similar negative pricing for new wind farms and zero for older wind farms

ITP Study Draft Schedule

ITP MODEL BUILD



ITP ASSESSMENTS AND ANALYSIS

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2019 ITP Load and Generation Review

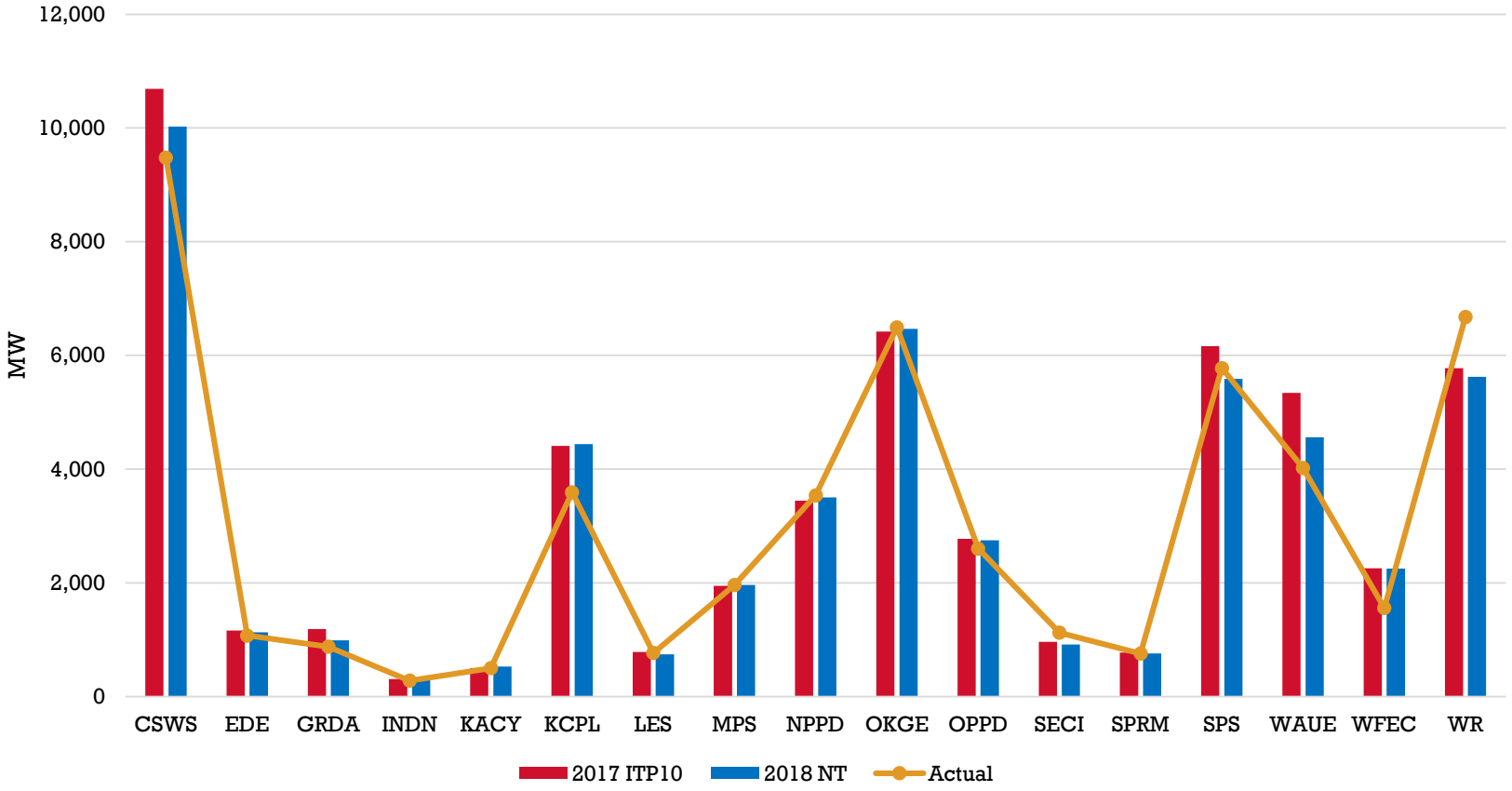
Nikki Roberts

October 12, 2017

Load Review Update

- Load Review 1st pass posted on 9/1/2017
- Stakeholder Feedback was due by 10/2/2017
  - SPP Staff is in the process of reviewing and incorporating feedback
- Load Review 2nd pass will be posted on 11/3/2017
  - Intended to be informational posting only
  - SPP Staff will update the bus demand group mappings per the 2019 ITP powerflow models and post for Stakeholders to view.
- Review period for 2nd pass ends on 11/17/2017

2017 Peak Load Comparison



Gen Review Update

- Generation Review 1st pass posted on 9/1/2017
- Stakeholder Feedback was due by 10/2/2017
  - SPP Staff is in the process of reviewing and incorporating feedback
- Generation Review 2nd pass will be posted on 11/3/2017
  - Intended to be mainly an informational posting
  - Update the machine bus mappings per the 2019 ITP powerflow models and post for Stakeholders to view.
  - Update Must run flags and hydro transactions to reflect approved Scope items
  - Stakeholders may submit Must run exceptions during review period
- Review period for 2nd pass ends on 11/17/2017

Gen Review Update

- RAR and Waiver request form sent out on September 15th
- RAR and Waiver request forms submitted to SPP Staff by October 11th
- Stakeholders have the October and November working group meetings to present to necessary working groups

Economic Operational Needs Solution Evaluation

Flowgate Needs

Economic solutions for flowgates will be initially evaluated based the amount of MW relief that is provided by the solution. A DC analysis will be performed on operational models that reflect system conditions when congestion occurs in order to identify the amount of relief each solution provides. The project will then be placed into a relief tier based on the amount of congestion that is relieved on the flowgate. Each relief tier will have a bandwidth of 10%.

The top 3 solutions from each relief tier will be further evaluated on an economic basis. A selection of 40 days with various operating conditions will be selected to determine an average production cost savings based on daily operational models. To determine annual production cost savings based on daily actual operational models, SPP will determine the difference in market costs on historic days compared to the same day with the proposed solution added to the model. APC benefit will then be calculated for 1 year. A one year B/C ratio will be calculated for each project. The average production cost savings will be compared with the cost and feasibility of each project to determine the best solution. If any of the projects are deemed infeasible, staff may select alternate projects within that tier for further economic analysis

Manual Commitment of Generators

Economic solutions for needs due to manual commitments of generators in the Integrated Market will be evaluated based on the magnitude of need on operational models where the manually committed generator is not allowed to be dispatched. The annual benefit of the project will equal to the absence of the average annual Make Whole Payment requirement. A one year B/C ratio will be calculated for each project. Project selection will consider the cost of the solution as well as the ability of the solution to reduce or completely replace the need for the manual commitment with regards the amount of Make Whole Payment that would no longer be necessary.

Reliability Operational Needs Solution Evaluation

System Reconfiguration for Voltage Issues

Reliability solutions for these needs will be evaluated using the CVR metric defined in the TWG Reliability Screening Metrics document.

System Reconfiguration for Thermal Issues

Reliability solutions for these needs will be evaluated using the CLR metric defined in the TWG Reliability Screening Metrics document.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2019 ITP Portfolio Consolidation

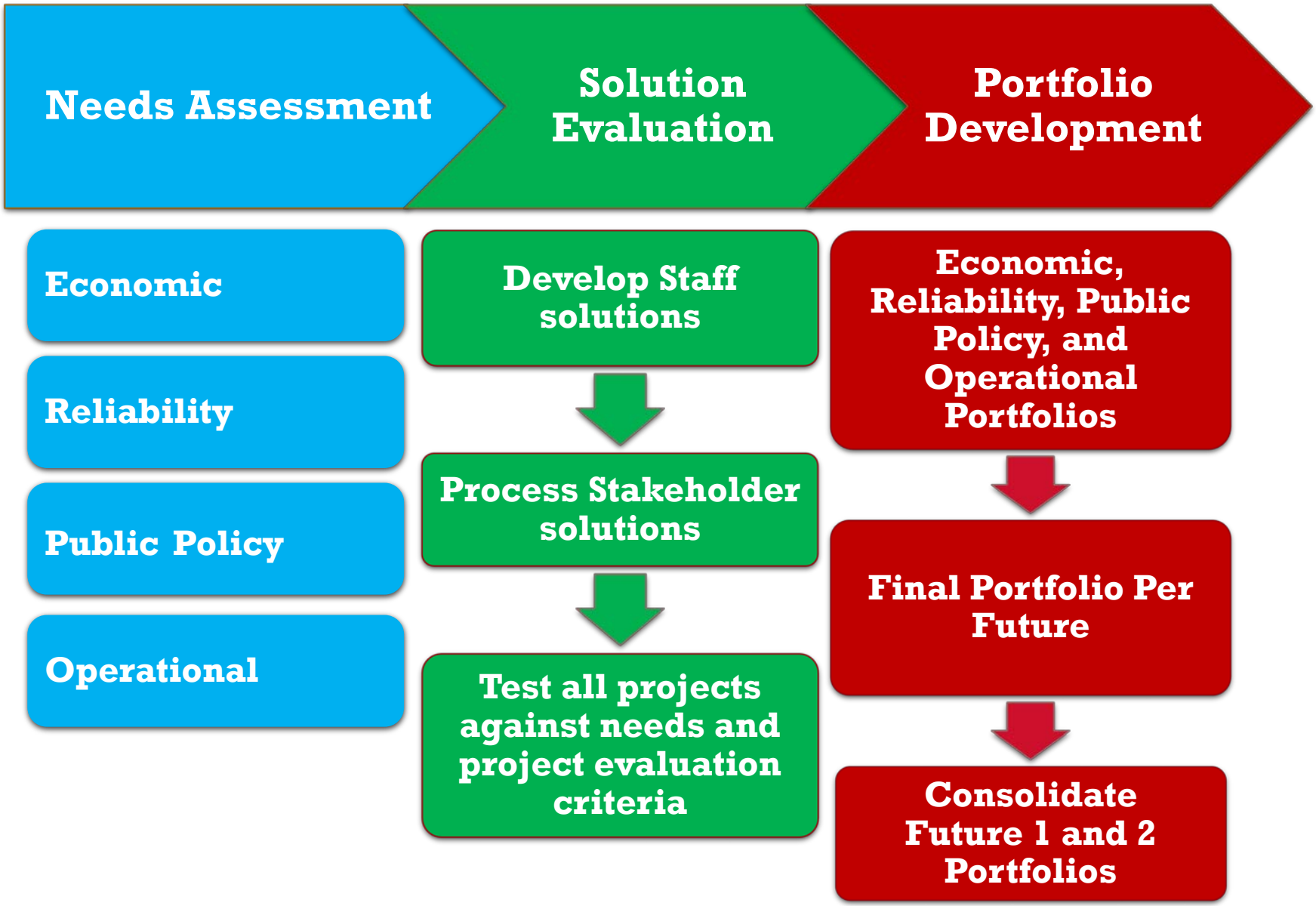
SPP Staff

October 12, 2017

Objective

- Approve Portfolio Consolidation by November 15th

Process Overview



ITP Manual Language

Section 6.2 Portfolio Consolidation

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

2015 ITP10 Consolidation

- Economic projects used a coupling criteria
  - Future 1 projects with a 1-year B/C ratio greater than 0.9 were included in the consolidated portfolio.
  - Future 2 projects with a 1-year B/C ratio greater than 0.7 in Future 1 and with a 1-year B/C ratio greater than 0.9 in Future 2 were included in the consolidated portfolio.
- Policy projects will be included in the consolidated portfolio if they meet a policy need in Future 1.
- Reliability projects used a coupling criteria
  - Reliability projects will be included in the consolidated portfolio if they mitigate a thermal/voltage violation in Future 1.
  - A Future 2 reliability project was included if it mitigates a thermal violation in Future 2 and mitigates 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 will also be included in the consolidated portfolio.
- Additionally, projects with significant potential value could be selected to be part of the consolidated portfolio if SPP Staff presented the project and justification to the appropriate stakeholder groups and obtained approval from those groups.

2017 ITP10 Consolidation

- Developed two portfolios (CPP and reference case portfolios)
- Economic projects used a weighted sum of 1-year APC B/C ratios to develop CPP portfolio
  - The projects performance in Future 1 contributed 75% of the weighting.
  - The projects performance in Future 2 contributed 25% of the weighting.
  - The sum of the weighted B/C ratios was required to meet the 0.9 threshold.
- Reliability projects used a coupling criteria to develop CPP portfolio
  - All Future 1 Needs will be addressed by the CPP portfolio. A subset of Future 2 Needs will be addressed by the CPP portfolio if the Future 2 need meets the Consolidation Methodology criteria. The subset of Future 2 Needs will be considered for evaluation if:
    - A monitored element's % loading was 95% or greater in Future 1 and greater than 100% in Future 2; or
    - The per unit voltage of a bus was .92 p.u. or lower in Future 1 and lower than 0.9 p.u. in Future 2.

2017 ITP10 CPP and Reference Case Consolidation

- Projects were evaluated based on individual merit
- Final project recommendations were generally based on the following criteria:
  - Need remains in updated models ("sidebar")

    AND
  - Project performs well in Future 1 and Future 3 models

    OR
  - Project performs well in Future 1 or Future 3, and resolves current point of congestion in SPP market

Consolidation Options

- Coupling Criteria
  - Generally gives more emphasis to one future over the other and allows projects from other future to be included if additional criteria is met
- Weighted Futures
  - Weighting of futures determined based on confidence in each future
  - Project selected if weighted sum of B/C ratios from futures exceeds threshold
- Individual Project Review
  - Review project drivers and benefits if B/C ratio exceeds certain threshold and present the project and justification to the appropriate stakeholder groups for approval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2019 ITP Scope - Sensitivities

ESWG

October 12, 2017

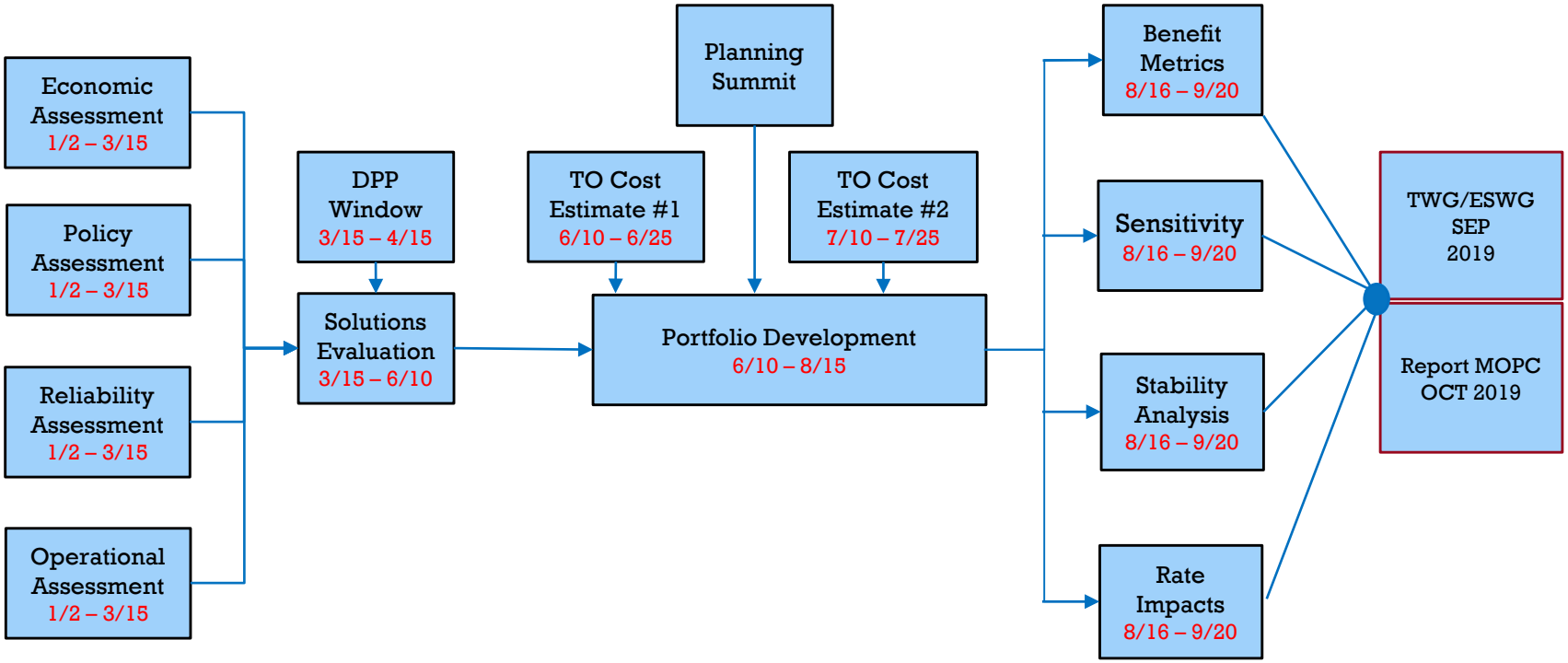
ITP Manual Language

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

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

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

ITP ASSESSMENTS AND ANALYSIS



Proposed Sensitivities I

- High and low natural gas price
  - Option 1: Utilize 2 standard deviations
    - 68% confidence level
    - 95% confidence level
  - Option 2: Customize around portfolio
    - Utilize current (in respect to sensitivity schedule) Henry Hub prices as either the high or low gas price sensitivity
    - Implement an equal and opposite percentage for the other gas price sensitivity, with a minimum percentage change of 25% from the gas prices in the economic model.
- High and low demand growth
  - Option 1: Utilize 1 standard deviation
    - 68% confidence level
  - Option 2: Customize around portfolio
    - Utilize historical load growth by area to determine % load increase or decrease

Proposed Sensitivities II

- Reduced wind and solar
  - Utilize GI Queue as it stands at the start of the sensitivity milestone
  - Utilize Resource Siting manual
- Increased wind and solar
  - Utilize Resource Siting manual
- Must-Run
  - Most impacting units affecting portfolio solved constraints that are set to must run will have must-run status removed
    - Units with up to 20% shift factor will be considered impacting
- ESWG suggestions

Sensitivity Summary

- Manual requires 4 sensitivities
  - Pending schedule finalization staff may be able to analyze an additional 2 sensitivities
- ITP Manual required sensitivities:
  - High natural gas
  - Low natural gas
  - High demand
  - Low demand
- Additional Sensitivity Options:
  - Increased wind and solar
  - Decreased wind and solar
  - Must run
  - ESWG Suggestions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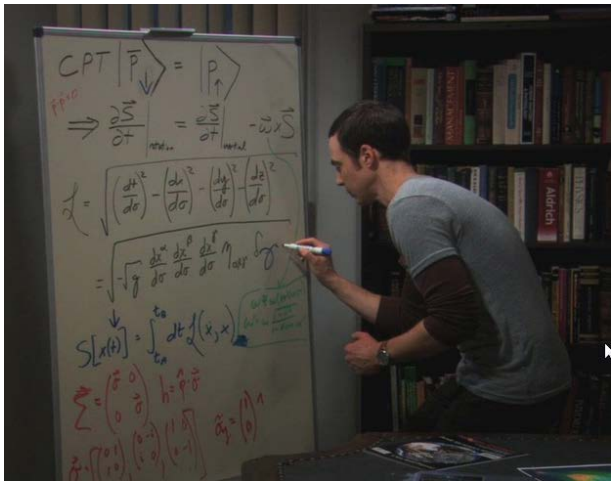
Adjusted Production Cost Calculations

SPP staff

APC Calculation Background

- APC Benefit = Base APC – Change APC
- APC = Production Cost ($) + Purchases ($) – Sales ($)
  - Computed by zone, by hour
  - All hours summed to compute annual zonal APC
  - All zones summed to compute annual regional APC



APC Calculation Background

- Production Cost ($)
  - Production Cost ($) = Unit Cost ($) + Billing Cost ($)
  - Unit Cost is the cost of fuel and O&M (i.e. conventional generation)
  - Billing Cost is the cost of transactions (i.e. renewable generation)
- Purchases ($)
  - APC ($) = Production Cost ($) + Purchases ($) – Sales ($)
  - Purchases ($) = Net Purchases (MWh) * LLMP ($/MWh)
  - Load weighted LMP accounts for all loads designated to a zone
- Sales ($)
  - APC ($) = Production Cost ($) + Purchases ($) – Sales ($)
  - Sales ($) = Net Sales (MWh) * GLMP
  - Gen weighted LMP accounts for conventional and renewable resources assigned ownership to a zone

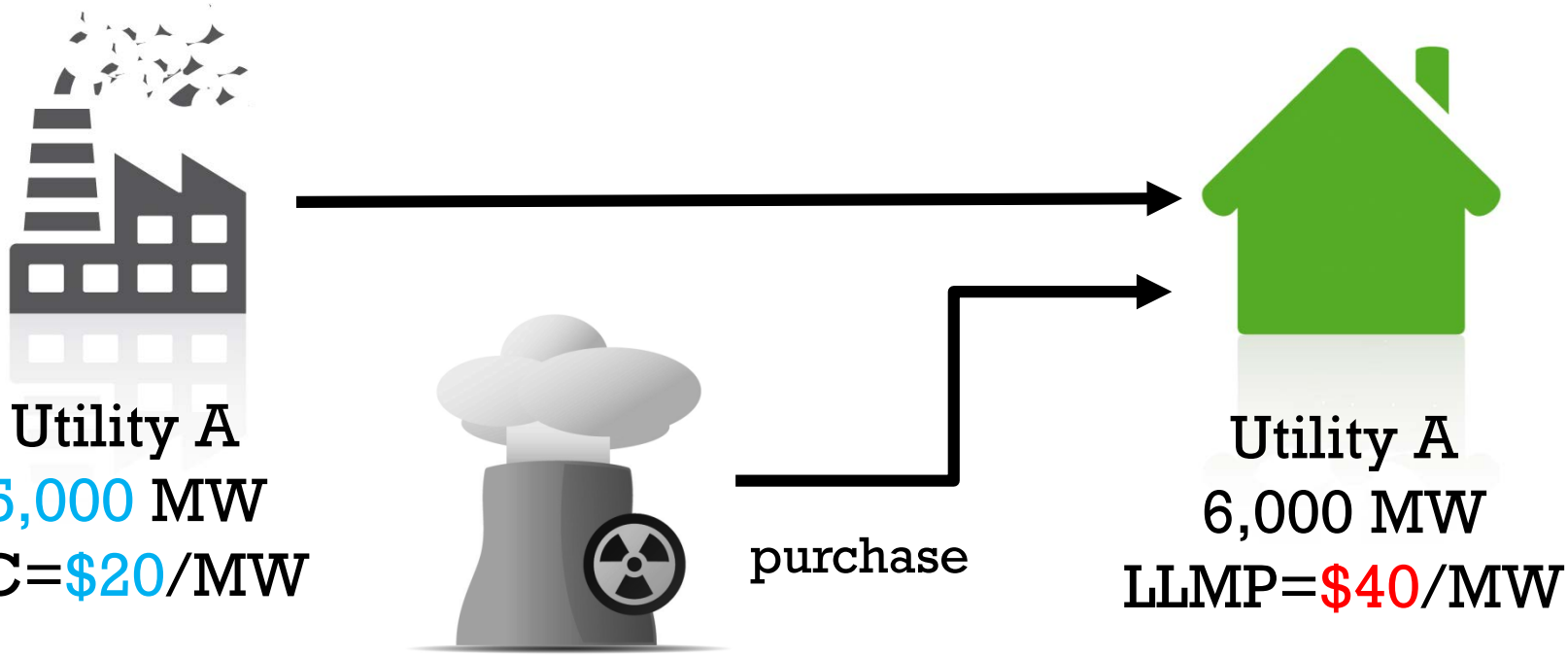
SPP

Purchase/Sale

- Purchase ($) = Net Purchase (MW) * LLMP ($/MW)
  - by hour, by zone
- Sale ($) = Net Sale (MW) * GLMP ($/MW)
  - by hour, by zone

- Net Purchase/Sale (MW) = ∑ zonal demand - ∑ zonal generation
  - i.e. only purchase or sale MW is subject to LMP price
  - LMP = MEC + MLC + MCC

Adjusted Production Cost Example



$$APC_{\text{Utility A}} = \$20/\text{MW} \cdot 5{,}000\text{MW} + \$40/\text{MW} \cdot 1{,}000\text{MW}$$
$$= \$140{,}000$$

SPP's Zones

Pricing Zones (SPPMAIN)

- AEPW
- CUS
- EMDE
- GMO
- GRDA
- IS
- KCPL
- LES
- MIDW
- MKEC
- NPPD
- OKGE
- OPPD
- SUNC
- SWPS
- WFEC
- WRI

Other Zones (SPPADDL)

- KACY
- OTHERSPP (with no load assigned APC = 100% revenues as sales to other zones)
- SWPA

$$APC_{SPP\ TOTAL} = \sum APC_{SPPMAIN} + \sum APC_{SPPADDL}$$

APC and Transmission Service Assumptions

- Net purchase/sale approach assumes
  - Zonal generation serves zonal load at production cost
  - Excess load is served at zone's load LMP
  - Excess generation is sold at zone's generation LMP
- Zonal generation serving zonal load at production cost assumes
  - Load is not subject to marginal congestion (or losses) costs
- Owned and unit-specific purchases of generation assumed to have long-term firm transmission service which can convert that service to an ARR/TCR to receive a hedge to its load in the SPP market
- From the approved benefit metrics manual, APC calculation assumes congestion between owned generation and load can be fully hedged while none of market-based purchases would be hedged

Resource Expansion Plan Proxy Generation

- Resource adequacy requires firm delivery and generally applies to non-intermittent resources
- Historically, proxy generation added for resource adequacy and economic energy has been assigned to pricing zones
- ITP Manual 2.2.2 Resource Plan
  - Renewable Resource Expansion Plan – "Renewable additions will be computed using criteria that can be applied uniformly across pricing zones"
  - "Each pricing zone shall be assessed for resource adequacy…"
    - "Ownership of conventional unit additions will be allocated to pricing zones such that each pricing zone approximately meets the reserve margin requirement."
- Through assignment to pricing zones, the APC calculation assumes that proxy generation will attain transmission service

Transmission Service Trends

- Additional merchant wind resources are participating in the SPP Integrated Market without acquiring long-term firm transmission service
- Some LSE transmission customers are not pursuing long-term firm transmission service for long-term purchased wind resources

Alternative Approach Options

- Reflect current trends in modeling
  - Assign wind additions (energy resources) to OTHERSPP zone
  - Reassign existing wind resources without long-term transmission to OTHERSPP zone
- Impact to zonal APC
  - Utilities purchase energy resources at LMP price
- Consideration for SPP APC
  - Remove OTHERSPP zone from transmission benefit to cost ratio calculation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2018 ESWG Meeting Schedule

ESWG

August 16-17, 2017

Proposed Schedule – 1st Semester

January

S	M	T	W	T	F	S
	1	2	3	04	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February

S	M	T	W	T	F	S
				1	2	3
4	5	9	7	08	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

March

S	M	T	W	T	F	S
				1	2	3
4	5	06	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

April

S	M	T	W	T	F	S
1	2	03	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

May

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	10	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

June

S	M	T	W	T	F	S
					1	2
3	4	5	6	07	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Month	Day	Location
January	11	Dallas
February	21-22	OKC (Leon will check)
March	15	Dallas
April	25	Kansas City (KCPL)
May	15-16	Bennie-Denver
June	14	Dallas

BOD
RSC
MOPC
PCWG
Summit

CAWG
TWG
ESWG
MDWG
RTWG

SSC
SPC
SAWG

SPP Holiday

Combination Dates
ESWG/TWG
ESWG/SSC
ESWG/PCWG
SSC/CAWG
PCWG/TWG/SSC
PCWG/SSC
SAWG/TWG
ESWG/SAWG

Proposed Schedule – 2nd Semester

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

August

S	M	T	W	T	F	S
			1	2	3	4
5	6	9	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September

S	M	T	W	T	F	S
						1
2	3	4	5	06	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

October

S	M	T	W	T	F	S
	1	02	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November

S	M	T	W	T	F	S
				1	2	3
4	5	06	07	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December

S	M	T	W	T	F	S
						1
2	03	04	5	06	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Month	Day	Location
July	19 or 26	Detroit, MI
August	15-16	Billings, MT
September	13	Dallas
October	11	Dallas
November	7-8	Little Rock
December	3	Dallas

BOD
RSC
MOPC
PCWG
Summit

CAWG
TWG
ESWG
MDWG
RTWG

SSC
SPC
SAWG

SPP Holiday

Combination Dates
ESWG/TWG
ESWG/SSC
ESWG/PCWG
SSC/CAWG
PCWG/TWG/SSC
PCWG/SSC
SAWG/TWG
ESWG/SAWG


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Transmission Outages Metric

Antonio Barber

October 12, 2017

History of the Metric

- Full analysis performed for RCAR I in 2012/2013.
  - Transmission Outages added an 11.3% of the total APC benefit.
  - 11.3% Used in 2015 ITP10, RCAR II, and 2017 ITP10
- ESWG 6/24/14 Minutes
  - The calculation of Mitigation of Transmission Outage Costs benefits should include a "periodic review of the historical transmission outages to ensure the methodology is historically reasonable."

Options Moving Forward

- Leverage 2015 Analysis
- Full Analysis
- Model Selection
  - RCAR II models
  - 2017 ITP10 models

Leverage 2015 Analysis

- Analysis began in the RCAR II
- 2013 Historical Outages
- Outages Included:
  - Greater than or equal to 230 kV & Greater than or Equal to 5 days
  - Outages 138-161 kV & Greater than or Equal to 5 days
  - Baseline Outage Distribution Factors (LODF):
    - Contingencies on all constraints greater than or equal to 50%
    - Monitored branches of binding constraints greater than or equal to $1M with LODF ≥ 35%
  - PROMOD simulations
  - Constraint assessment for additional events
  - Calculate metric value as percentage of regional APC benefit

Completed work

Continuing RCAR II Analysis

- Staff hours
  - Approximately 270 hours (including constraint assessment)
- Stakeholder touchpoints
  - Reviewing and approving set of outages to use
  - Approving constraint assessment process and results
- Pros
  - 2013 Outages Valid
  - Significant time savings
- Cons
  - Minimal new topology not included in outages (not applicable to RCAR II models options)

Full Analysis

- Historical Outages (2015 or 2016)
- Methodology:
  - Develop Outages Conditions
- PROMOD simulations
- Constraint assessment for additional events
- Calculate metric value as percentage of regional APC benefit

Conducting Full Analysis

- Staff hours
  - Approximately 520 hours (including constraint assessment)
- Stakeholder touchpoints
  - Reviewing and approving set of outages to use
  - Approving constraint assessment process and results
- Pros
  - Updated Topology
  - Current Outages*
- Cons
  - Significantly more time
  - Minimal improvement expected to be gained

* May include additional/new topology outaged, but the accuracy is not improved

Recommendation

SPP staff recommends leveraging the work from RCAR II analysis on the RCAR II models to continue the evaluation of the Mitigation of Transmission Outages benefit metric.


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GlobalScape Migration

(for Engineering Data Exchange)

07/2017 CWG

Joshua Monroe/(501)688-8304/jmonroe@spp.org

Background

- Project Overview
  - Migration of engineering file sharing from TrueShare to GlobalScape
- Value or Purpose
  - TrueShare is a tool used by SPP Engineering staff to exchange data with member and other external engineering staff
  - The GlobalScape solution is hosted in house at SPP
  - Allows for greater security and control over information shared with members

Member Impact and Expectations

- Member Impact
  - This tool is only used by employees within engineering groups (it will not affect those who do not use the current tool, TrueShare)
  - Basic business functions will remain the same as with the TrueShare file sharing solution (with the exception of the six-month expiration period)
  - The GlobalScape site provides a more friendly user interface and is able to handle larger files
- Action needed from Members
  - Users will be required to access a new site for file sharing with SPP at the following link: SPPDocushare
  - Users will need to be on the lookout for new log-in information from SPP
  - Users will need to adapt to the twelve-month expiration period by ensuring that they download and save critical information in a timely fashion

Timeline

Project Schedule

Date	Responsible Party	Action
7/13	SPP	Publish MIPO to CWG site
7/20	SPP	Review MIPO w/ CWG
9/11	SPP	Publish MP Testing details via MIPO revision
9/18-10/2	SPP	Migrate files from TrueShare to GlobalScape
10/3-10/23	SPP / Member	Training
10/23-11/6	Member	Testing phase
11/7	SPP/Member	Migration Complete

*Please Note: TrueShare will be available through January of 2018 with read-only access.

Project Resources

- Training will consist of a series of WebEx conferences
- Use of the GlobalScape tool will be demonstrated
- A document will be made available to all users with instructions for how to use GlobalScape
- GlobalScape online help files can be found here: http://help.globalscape.com/help/

Key Takeaways

- Important Points to Remember
  - This migration will only affect engineering groups, as they are the users of the current tool, TrueShare
  - TrueShare is hosted externally
  - Due to information security concerns, SPP has decided to bring the file sharing solution in-house by utilizing the GlobalScape product which is hosted internally
  - This will allow greater control and security of the information shared and housed on SPP's file sharing platform
  - Users of the current tool, TrueShare, will need to be on the lookout for new login info when GlobalScape is rolled out
  - Members are encouraged to review the MIPO
  - Members will need to adapt processes and procedures to reflect the new tool and the twelve-month retention plan

Questions