Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

November 18th-19th, 2015

SPP Corporate Offices, Little Rock, AR

• SUMMARY OF ACTIONS TAKEN •

1. Approved phase 2 of the 2017 ITP10 resource plan for Future 3 (no CPP implementation)
2. Approved phase 2 of the 2017 ITP10 resource plan for Future 1 (regional CPP implementation)
3. Provided SPP Staff direction on development of phase 2 of the 2017 ITP10 resource plan for Future 2 (state by state CPP implementation)

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

November 18th-19th, 2015

SPP Corporate Offices, Little Rock, AR

• 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 1:03 PM, welcomed those in attendance, and asked for introductions.

There were 24 in-person participants and 27 web conference participants, representing 13 of 13 ESWG members. (Attachment 1 – November 18-19, 2015 Attendance List)

Agenda Item 1b – Receipt of Proxies

Alan Myers (ITC Great Plains) asked for any proxy statements. Two proxies were identified; Kip Fox (AEP-Transource) named Wayman Smith (AEP) as his proxy, Al Tamimi (Sunflower) named Ryan Yokely (Sunflower) as his proxy for November 19th. (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 – November 18-19, 2015 Agenda)

Tim Owens (NPPD) made a motion; seconded by Kurt Stradley (LES) 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. Action item 154 (SPP staff to work with ESWG members to create a data request to gather the energy efficiency amount included in the model) was removed from the list due to the direction taken in the 2017 ITP10 study that minimized its need. (Attachment 4 – Past Action Items)

Agenda Item 3 – Consent Agenda

The Consent Agenda included the following items:

Meetings Minutes – October 22nd, 2015 (Attachment 5 – ESWG 10.22.15 Minutes)

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

The consent agenda 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 continues to discuss combining the ITPNT and ITP10 assessments as well as the TPL assessment. The major issues currently surrounding incorporation of the TPL is in the details of modeling requirements.

Agenda Item 5 – Board Update

Alan Myers (ITC Great Plains) gave an update on the October SPP Board of Directors meeting. The Board approved the ITP10 scope, including the gas price update voted on at the October ESWG.

Agenda Item 6 – Study Schedules

Agenda Item 6a – 2017 ITP10

Juliano Freitas (SPP Staff) gave an update on the status of the 2017 ITP10 Study. Juliano showed some concerns about not having a well-defined methodology for projects consolidation, grouping and selection, before starting the DPP window. (Attachment 6 – 2017 ITP10 Schedule)

Agenda Item 6b – RCAR II

Juliano Freitas (SPP Staff) gave an update on the status of the RCAR II. The group requested Staff to include more details of approvals from TWG, ESWG, and RARTF as well as synching up with the meeting schedules once those are developed. (Attachment 7 – RCAR II Schedule)

Agenda Item 7 – 2017 ITP10 Resource Plan Phase 2

Agenda Item 7a – Future 3/Future 1

Josh Ross (SPP Staff) presented the updated results of phase 2 of the resource plan for Future 3. Adjustments were made based on changes detailed at the October ESWG meeting and other member feedback. Tim Owens (NPPD) expressed concern regarding the level of wind additions for the NPPD zone considering a non-CPP future. Leon Howell (OGE) expressed concern regarding the addition of a combined cycle plant for the OGE zone in the staging model. Wayman Smith (AEP) mentioned general concerns about the stagnant nature of data as a product of the ITP process, including load forecasts. One adjustment was made to the additional wind included for the GMO zone in order to correct the decrease in capacity over time that was reflective of the load forecast.

> **Wayman Smith (AEP) made a motion; seconded by Don Le (NextEra) to approve the current draft of the resource plan for Future 3 of the 2017 ITP10. The motion was approved with three abstentions, Leon Howell (OGE), Natasha Henderson (GSEC), and Tim Owens (NPPD).**

Kelsey Allen (SPP Staff) presented the updated results of phase 2 of the resource plan for Future 1. Kelsey requested feedback from the group regarding the carbon cost adder and retirement approach taken to implement CPP compliance. Staff's approach attempted to address potential concerns with the ability to maintain compliance under the multi-market structure that will be simulated in PROMOD without having to make additional adjustments. (Attachment 8 – 2017 ITP10 Resource Plan Phase 2 - F3_F1)

> **Tim Owens (NPPD) made a motion; seconded by Wayman Smith (AEP) to approve the current draft of the resource plan for Future 1 of the 2017 ITP10. The motion was approved with three abstentions, Leon Howell (OGE), Pat McCool (KCPL), and Natasha Henderson (GSEC).**

Agenda Item 7b – Future 2

Chris Jamieson (SPP Staff) presented the draft results of phase 2 of the resource plan for Future 2. Staff took an approach involving development of resource plans for each state in the Eastern Interconnection covered by the SPP RTO footprint, which includes portions of first tier entities. In this approach, hard lines were drawn around state borders for load and conventional resources, resulting in utilities operating in multiple states to be a part of multiple plans. There were specific concerns about some of the results and general concerns about the treatment of retirements, renewables, and the inability to reflect imports/exports across state boundaries under this approach. After robust discussion, Chris Jamieson proposed an approach to address these general concerns.

- Continue with state structure
  - QA and make adjustments
  - Glean retirements and carbon price
- Utilize retirements from state structure in regional structure
- Develop resource plan with assumed F1 retirements and retirements gleaned from state structure
- Incorporate resource plan into PROMOD
- Utilize PROMOD to determine carbon prices by state

ESWG members agreed with the adjustments proposed by SPP Staff. SPP Staff will present the results in the next meeting on December 10, and request members to approve the Future 2 resource plan. (Attachment 9 – 2017 ITP10 Resource Plan Phase 2 – F2)

Agenda Item 7c – External

Kelsey Allen (SPP Staff) reviewed the proposed methodology for development of a resource plan for external entities. After discussion and new information available, Staff proposed to leverage the MISO MTEP 16 analysis and incorporate information as appropriate. The group also directed Staff to utilize the same resource plan for external entities in both CPP futures in order to analyze the impact of a changing SPP system without additional external impacts. (Attachment 10 – 2017 ITP10 Resource Plan Phase 2 – External)

Agenda Item 8 – 2017 ITP10 Siting Update

Chris Jamieson (SPP Staff) reviewed the proposed siting methodologies for conventional, wind, and solar generation. Staff will be posting preliminary plans for futures 1 and 3 for review as early as 11/20. (Attachment 10 – 2017 ITP10 Siting Update)

Agenda Item 9 – 2017 ITP10 Study Assumptions

[This item was not covered] (Attachment 11 – 2017 ITP10 Study Assumptions)

Agenda Item 10 – 2016 ESWG Meeting Schedule

Kelsey Allen (SPP Staff) briefly reviewed the 2016 meeting schedule and requested all members review the dates and locations for any suggested changes. The dates and locations for the first semester 2016 were generally agreed upon. (Attachment 12 – 2016 ESWG Meeting Schedule)

Agenda Item 11 – MOPC Action Item 255

[This item was not covered] (Attachment 13 – MOPC Action Item 255)

Closing Items

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

List of action items from the meeting:

1. SPP Staff to investigate any confidentiality restrictions of providing wind and solar siting data to all stakeholders.

The meeting was adjourned at 11:40 PM.

Respectfully Submitted,

Kelsey Allen
ESWG Secretary

Southwest Power Pool

Southwest Power Pool, Inc.

ECONOMIC STUDIES WORKING GROUP

November 18-19, 2015

SPP Corporate Office/Little Rock, AR

• ATTENDANCE LIST •

Name	Company
Alan Myers	ITC
Arlene Sosa Vazquez	NEER
JASON SHOOK	GDS/ETEC
Michael Wegner	ITC
Leon Howell	OGE
Wayman Smith	AEP
Bennie Weeks	Xcel
Pat McCool	KCPL
Natasha Henderson	OMPA
Bethany King	GDE
Kurt Strasser	KES
Tim Owens	NPPD
Jody Holland	SCMCN

SPP Southwest Power Pool

Southwest Power Pool, Inc.

ECONOMIC STUDIES WORKING GROUP

November 18-19, 2015

SPP Corporate Office/Little Rock, AR

• ATTENDANCE LIST •

Name	Company
Bethany King	EDE
Natasha Henderson	GSEC
Pat McCool	KCPL
Bennie Weeks	Xcel/SPS
Jordan Schmieli	Xcel Energy/SPS
Wayman Smith	AEP
Leon Howell	OGE
Michael Wegner	ITC
JASON SHOOK	GDS/ETEC
Arlene Sosa Vazquez	NEER
Alan Myers	ITC
Tim Owens	NPPD
KURT STRADLEY	LES
Brett Hooton	SPP
Jason Davis	SPP
Josh Ross	SPP
Eric Burkey	Ameren
Meena Thomas	Texas Commission
Jody Holland	SCMCN
Steve Gaw	Wind Coalition
JULIANO SCHROMM FRUTTI	SPP
Amber Grab	SPP

Name	Email	Company	Attendance
Aaron Pupa (LS Power)	apupa@lspower.com		Webex
Al Tamimi		Sunflower	In Person
Alan Myers		ITC	In Person
Amber Greb	agreb@spp.org	SPP	In Person
Anita	asharma@aep.com		Webex
Arlene Sosa Vazquez		NEER	In Person
Bennie Weeks		Xcel	In Person
Bethany King		EDE	In Person
Bill Leung (NPRB)	bleung@bjleung.com		Webex
Bret Toplyn	bret.toplyn@us.abb.com		Webex
Brett Hooton		SPP	In Person
David Binkley	dbinkley@itctransco.com		Webex
Deral Danis	ddanis@cleanlineenergy.com		Webex
Don Le (NextEra Energy)	don.le@nee.com		Webex
ed pfeiffer (quanta)	epfeiffer@quanta-technology.com		Webex
Eric Burkey		Ameren	In Person
Evan Racine-Johnson (GSEC)	eracine-johnson@gsec.coop		Webex
Gimod Olapurayil	golapurayil@itctransco.com		Webex
Jason Davis		SPP	In Person
Jason Shook		GDS/ETEC	In Person
Jeremy Harris	jeremy.harris@westarenergy.com		Webex
Jeremy Severson	jseverson@bepc.com		Webex
Jody Holland		SCMCN	In Person
Joe Fultz	jfultz@grda.com		Webex
John Boshears	john.boshears@cityutilities.net		Webex
John Mills	jmills@spp.org		Webex
Jon Iverson	jiverson@oppd.com		Webex
Jordan Schmick		Xcel Energy/SPS	In Person
Josh Ross		SPP	In Person
Juliano Schramm Freitas		SPP	In Person
Kelsey Allen	kallen@spp.org	SPP	In Person
Kevin Foflygen (SPRM)	kevin.foflygen@cityutilities.net		Webex
Kurt Stradley		LES	In Person
Leon Howell		OGE	In Person
Liz Gephardt (SPP)	lgephardt@spp.org		Webex
Meena Thomas	meena.thomas@puc.texas.org	Texas Commission	In Person
Michael Massery (AECC)	michael.massery@aecc.com		Webex
Michael Watt (OMPA)	mwatt@ompa.com		Webex
Michael Wegner		ITC	In Person
Natasha Henderson		GSEC	In Person
Nikki Roberts	nroberts@spp.org		Webex
Noumvi Ghomsi	noumvi.ghomsi@psc.mo.gov		Webex
Pat McCool	patrick.mccool@kcpl.com	KCPL	In Person
Randy Collier (CUS)	randy.collier@cityutilities.net		Webex
Rosemary Mittal	rmittal@spp.org		Webex
Ryan Yokley	ryokley@sunflower.net		Webex

Steve Gaw	rsgaw1@gmail.com	Wind Coalition	In Person
Tamika Barker	tbarker@spp.org		Webex
Tim Owens		NPPD	In Person
Todd Tadych (DATC)	ttadych@atcllc.com		Webex
Wayman Smith		AEP	In Person

1. **Kip Fox proxy to Wayman Smith**

From: Kip M Fox [mailto:kmfox@aep.com]
Sent: Wednesday, November 11, 2015 6:44 AM
To: Alison Lane (alane@misoenergy.org); Kelsey Allen; Juliano Freitas
Cc: Smith, Wayman
Subject: ESWG Proxy 11/18

I will be unable to make the ESWG meeting on 11/18-19 in Little Rock. Please have Wayman Smith be my proxy on the voting items for that meeting.

Thank you, Kip

Kip Fox
Director, Transmission Asset Strategy and Grid Development
American Electric Power
Transource Energy, LLC
1201 Elm Street
Suite 800
Dallas, Texas 75250
kmfox@aep.com
office: 214-777-1063
cell: 972-400-1384

2. **Al Tamimi proxy to Ryan Yokely**

From: Tamimi, Al [mailto:atamimi@sunflower.net]
Sent: Thursday, November 19, 2015 6:56 AM
To: Myers, Alan K.
Subject: Proxy

Alan,
I am at an EPRI meeting this morning next door to your meeting. Ryan Yokley will carry my proxy.
Thanks,
Al

Al Tamimi, Ph.D., P.E.
Sunflower Electric Power Corporation
V.P., Transmission Planning, Policy & Corporate Compliance
P.O.BOX 1020
Hays, Kansas 67601
Office: 785-623-3336
Cell: 785-656-0435
atamimi@sunflower.net

ECONOMIC STUDIES WORKING GROUP

November 18th-19th, 2015

SPP Corporate Offices, Little Rock, AR

• 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[1] (Approval Item) ..... Alan Myers (5 minutes)
    a. Approval of Meeting Minutes – October 22nd, 2015
4. Transmission Planning Improvement Task Force (TPITF) Update ..... Alan Myers (5 minutes)
5. Board Update ..... Alan Myers (5 minutes)
6. Study Schedules[1] ..... Juliano Freitas (15 minutes)
    a. 2017 ITP10
    b. RCAR II
7. 2017 ITP10 Resource Plan Phase Two ..... SPP Staff (180 minutes)
    a. Future 3/Future 1[1] (Approval Item)
    b. Future 2
    c. External

Thursday 8:00am – 12:00pm

8. 2017 ITP10 Siting Update[1] ..... Chris Jamieson (30 minutes)
9. 2017 ITP10 Study Assumptions ..... SPP Staff (120 minutes)
    a. Project Selection Methodology
    b. Project Grouping Methodology
    c. Portfolio Consolidation Methodology
    d. 40-Year Benefit Metric Calculation Methodology

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[1] Background Material Included

e. Sensitivities/Metrics/Rate Impacts

10. 2016 ESWG Meeting Schedule[1] ..... Kelsey Allen (20 minutes)
11. MOPC Action Item 255 ..... Kelsey Allen (30 minutes)
12. Closing Items ..... All (5 minutes)
    a. Summary of Action Items (Kelsey Allen)
    b. Future Meetings
        i. December 10th, 2015: 8th Floor AEP Offices, Dallas, TX

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

Pending Action Items Status Report

November 18th, 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 in the future.
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	
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	
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	September 23rd: ERCOT does not include this cost in their analysis of transmission projects.
~~154~~	~~SPP staff to work with ESWG members to create a data request to gather the energy efficiency amount included in the model~~	~~July 30, 2015~~	~~In Progress~~ ~~Staff~~	Removed due to change in methodology not requiring this request

155	Staff to draft a disclaimer for decisions in the 2017 ITP10 related to the Clean Power Plan	August 19-20, 2015	Complete Staff	
157	Staff to bring back a brushed up portfolio consolidation proposal to the next meeting; Alan Myers to bring back a counter-proposal	August 27th, 2015	In Progress Staff/Alan Myers	
158	Staff to develop a decision tree of approval items for the members	August 27th, 2015	In Progress Staff	For the 2017 ITP10 scope and study
161	SPP members to review posted detailed results of the Future 3 resource plan	October 9th, 2015	Complete Members	
162	SPP Staff to investigate any confidentiality restrictions of providing wind and solar siting data to all stakeholders	November 19th, 2015	In Progress Staff	

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

October 22nd, 2015

NextEra Offices, Juno Beach, FL

• SUMMARY OF ACTIONS TAKEN •

1. Approved 9/23 and 10/9 meeting minutes
2. Approved member requests to make model changes impacting the approved generation review for the 2017 ITP10
3. Approved the use of the ABB reference case as the source of the natural gas price forecast for the 2017 ITP10 instead of the previous approval to use NYMEX futures and DOE growth rates
4. By way of no action, previous approvals on solutions to the load pocket and trapped generation modeling issues for RCAR II stand as the current recommendation
    a. Load pocket – add CTs to the base case model
    b. Trapped generation – hybrid approach utilizing total benefit from status quo simulation and zonal allocation factors from removing wind from base case

Southwest Power Pool

ECONOMIC STUDIES WORKING GROUP

October 22nd, 2015

NextEra Offices, Juno Beach, FL

• 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 9:00 AM (EDT), welcomed those in attendance, and asked for introductions.

There were 19 in-person participants and 46 web conference participants, representing 13 of 13 ESWG members. (Attachment 1 – October 22nd, 2015 Attendance List)

Agenda Item 1b – Receipt of Proxies

Alan Myers (ITC Great Plains) asked for any proxy statements. Two proxies were identified; Kip Fox (AEP-Transource) named Wayman Smith (AEP) as his proxy, Al Tamimi (Sunflower) named Ryan Yokely (Sunflower) as his proxy from 10:00am – 12:00 am (CST). (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. Kelsey Allen (SPP Staff) requested item 8c. Futures Assumptions be removed from the agenda. (Attachment 3 – October 22nd, 2015 Agenda)

> **Kurt Stradley (LES) made a motion; seconded by Don Le (NextEra) 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. (Attachment 4 – Past Action Items)

Agenda Item 3 – Consent Agenda

The Consent Agenda included the following items:

> Meetings Minutes – September 23rd, 2015 (Attachment 5 – ESWG 09.23.15 Minutes)
> Meetings Minutes – October 9th, 2015

Alan Myers (ITC Great Plains) asked if any items should be removed from the consent agenda. The October 9th minutes were removed.

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

A correction to language comparing current natural gas prices to the 2015 ITP10 was made to the October 9th minutes.

> **Wayman Smith (AEP) made a motion; seconded by Pat McCool (KCPL) to approve the October 9th, 2015 minutes as modified. The motion was approved unanimously.**

(Attachment 6 – ESWG 10.09.15 Minutes)

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 current hurdles for the group are related to combining the NERC TPL and ITP processes and the impact to the TSR process. The group planned to complete its charge in January 2016 but the SPP Board of Directors (Board) and Strategic Planning Committee (SPC) have allowed the group to continue until April 2016, if needed, in

order for the TPITF to provide a better product. Other smaller discussions have hinged around incorporating more economic analysis in reliability studies performed by SPP.

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. He asked the group if the amount of time given to the membership for review of data for this study has been sufficient, the group affirmed. (Attachment 7 – 2017 ITP10 Schedule)

Agenda Item 5b – RCAR II

Juliano Freitas (SPP Staff) gave an update on the status of the RCAR II. (Attachment 8 – RCAR II Schedule)

Agenda Item 6 – Economic Model Updates

Kelsey Allen (SPP Staff) reviewed a list of requests for model updates submitted by the membership through review of the resource planning data and results. Some of the updates impact previous approvals made by the group. Staff believes the changes are valid but the main concern is the potential impact to the resource planning schedule. If the changes received to date can be incorporated without allowing time for additional submittals the data can be incorporated into the resource planning process. The group was amenable to the proposal. (Attachment 9 – Proposed Economic Model Changes)

> **Leon Howell (OKGE) made a motion; seconded by Wayman Smith (AEP) to approve the proposed model changes. The motion was approved unanimously.**

Agenda Item 7 – Miso Regional Review

Arash Ghodsian (MISO Staff) gave an overview of MISO's Regional Review Process and study results. Arash reviewed the overall process and then covered the detailed MISO's results of the three Interregional Projects approved in the SPP-MISO Coordinated System Planning study. (Attachment 10 - MISO Regional Review Process)

Agenda Item 8 – 2017 ITP10 Assumptions

Agenda Item 8a – Benchmarking (Hurdle Rates)

Kelsey Allen (SPP Staff) presented the results of the analysis performed on the various options for hurdle rates to be used in the 2017 ITP10 study. Staff tested the ABB zonal and nodal hurdle rates presented previously as well as a comparison to the 2015 ITP10 data. Staff concluded that the resultant import/export for the SPP region is similar for all data sets. There was concern about the level of imports shown by all three data sets. Staff suggested that other data should be investigated during the benchmarking process to adjust imports to an expected level rather than hurdle rates. Staff recommended using the ABB zonal hurdle rates developed from OASIS Tariffs. Staff will bring back overall benchmarking results with the recommended hurdle rates at a later date. (Attachment 11 – 2017 ITP10 Benchmarking)

Agenda Item 8b – Portfolio Consolidation Methodology

Alan Myers (ITC Great Plains) briefly covered the goal of portfolio consolidation and things the members should be thinking about in order to develop a methodology. Alan urged consideration of separating the Clean Power Plan (CPP) futures from the Business as Usual (BAU) in the methodology. The ultimate goal is to provide the Board of Directors (BOD) with enough information to make a decision on a set of projects to approve for Notification to Construct (NTC). Natasha Henderson suggested that the resulting methodology should address the structure of the state-by-state future model and its unlikeliness of implementation.

Agenda Item 9 – 2017 ITP10 Resource Plan Phase 2

Josh Ross (SPP Staff) presented the adjusted inputs and results for phase two of the Future 3 (no CPP implementation) resource plan. Staff started discussion on the natural gas prices and the impact to the dispatch being seen in the results, suggesting consideration of other data sources other than the NYMEX futures forecast. The group vehemently discussed the reasonableness of the price forecast and other data sources that could be used. Many suggested the forecast was too high, some suggested it was accurate, and others suggested it may be too low. The group suggested many options including continuing with the NYMEX forecast, updating with the ABB reference case or EIA, using independent 3rd party vendor forecasts, and multiple combinations of the discussed sources. It was also discussed that must run units should be considered in Future 3 in order to better reflect current operation of units and as a potential correction to the unit operation results in that future. After much discussion, it was suggested that now that the ABB data has the granularity that is needed for more accurate forecasting (monthly data instead of annual data, previously), the ABB reference case should be used in order to gain consistency with the other fuel prices being derived from the same source.

Wayman Smith (AEP) made a motion; seconded by Pat McCool (KCPL) to utilize the ABB reference case for the natural gas forecast of the 2017 ITP10. The motion was approved with one opposed, Natasha Henderson (GSEC), and one abstention, Alan Myers (ITC Great Plains).

Natasha voted no for the following reason: GSEC believes that natural gas prices will be lower than the NYMEX curve based upon updated supply and demand forecasts. The NYMEX curve has been used in the past, but now that it has dropped significantly and changed the mix of CT and CC, the methodology has changed. The ABB curve is higher than the NYMEX curve in middle and later parts of the curve. An updated ABB curve is scheduled to be released November 6, quite possibly lower, but the vote was not to consider the update (given it was to avoid possible timeline delays for the ITP10).

Staff requested feedback from the group regarding the interchange method used in the Future 3 model to simulate expected energy transfers between the four subregions. There was concern about utilizing a one year simulation (2015 ITP10 2025) to determine interchange for all years, given the amount of planned unit retirements in the different zones, especially nearing 20 years in the future. Staff suggested developing new annual interchange values from a regional resource plan simulation or simply converting the Future 3 model to a regional structure instead of the four subregions. The group directed staff to move forward with converting the model to a regional structure.

Kelsey Allen (SPP Staff) presented the results of the Future 1 (regional CPP implementation) focusing on the operation of gas and coal units. The current results do not include any additional requirements that could be implemented from the potential retirement methodology and survey previously reviewed by the members. Staff requested feedback on additional retirements and how they should be implemented. Some of the members suggested that they would not retire any units and would run units seasonally or keep active for capacity margin purposes. After discussion, the group directed Staff to follow the previously discussed methodology regarding retirements for units operating at low capacity factors, utilizing the exclusion list provided through member feedback during the previous survey. (Attachment 12 - 2017 ITP10 Resource Plan Phase 2)

Agenda Item 10 – RCAR Modeling Issues

Josh Ross (SPP Staff) reviewed the modeling issues of the RCAR process. He covered the previous ESWG approvals as well as the Staff recommendation for the load pocket and trapped generation issues. After discussion the group did not recommend a new methodology for either issue, therefore previous approvals stand.

- Load pocket – add CTs to the base case model
- Trapped generation – hybrid approach utilizing total benefit from status quo simulation and zonal allocation factors from removing wind from base case

Wayman Smith (AEP) noted that the process is too broken to fix the issue with any interim approach. (Attachment 13 – RCAR Modeling Issues)

Agenda Item 11 – 2016 ESWG Meeting Schedule

Kelsey Allen (SPP Staff) briefly reviewed the 2016 meeting schedule and requested all members review the dates and locations for any suggested changes. Kelsey solicited member meeting space for the four dates do not have locations picked. (Attachment 14 – 2016 ESWG Meeting Schedule)

Closing Items

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

List of action items from the meeting:

1. None

The meeting was adjourned at 4:00 PM (EDT).

Respectfully Submitted,

Kelsey Allen
ESWG Secretary

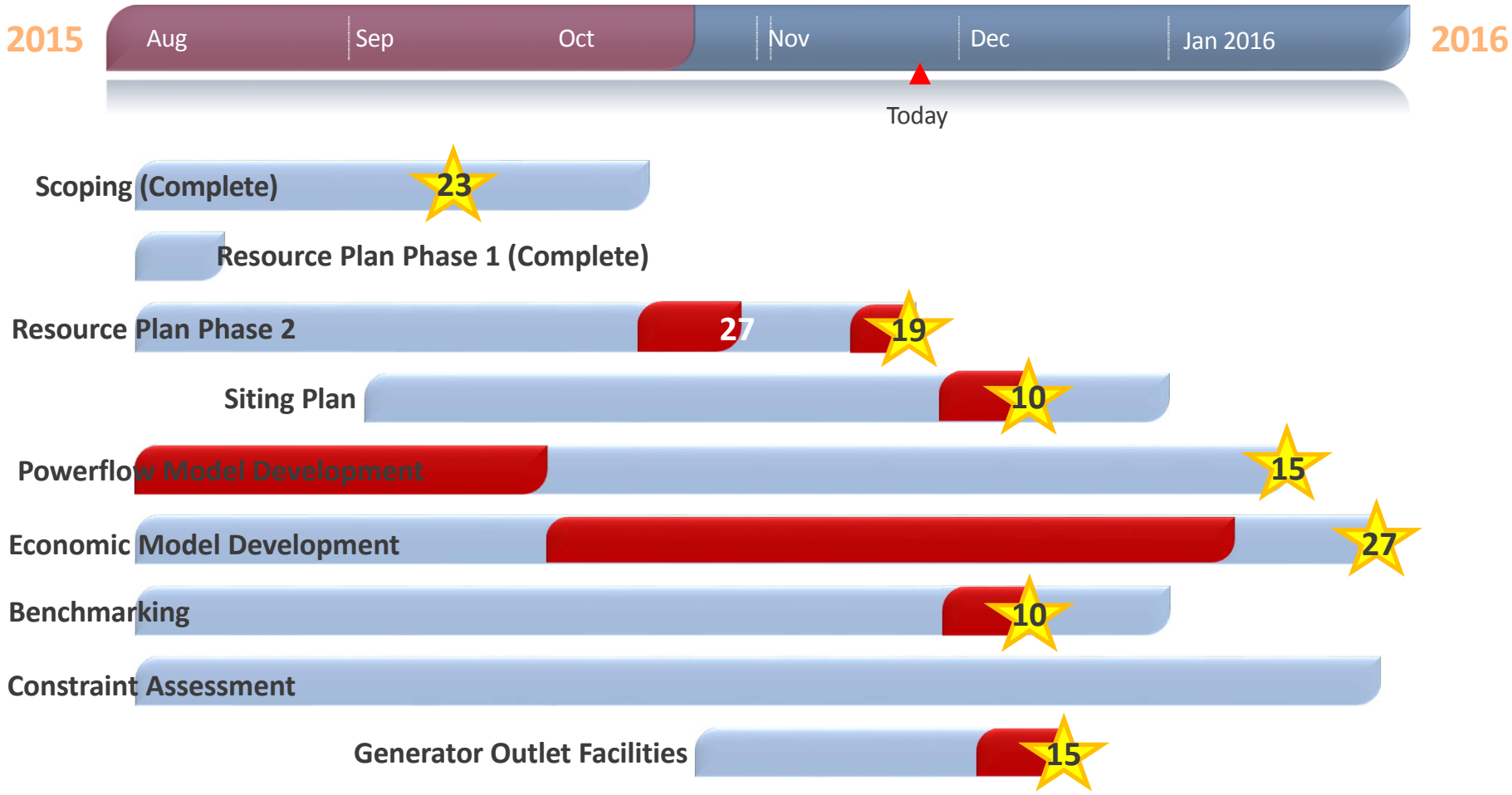
2017 ITP10 Schedule

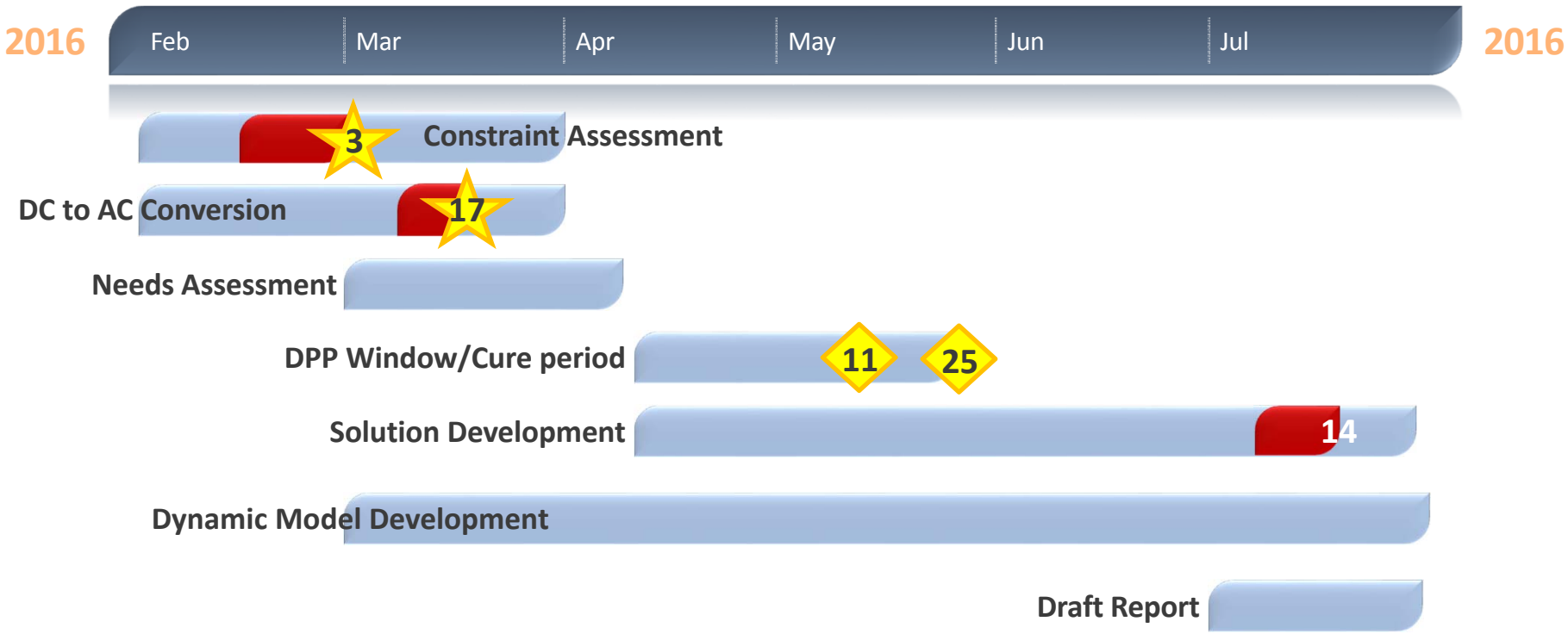
November 18th , 2015

ESWG

Juliano Freitas

Southwest Power Pool


2015
Aug
Sep
Oct
Nov
Dec
Jan 2016
2016
Today
Scoping (Complete)
23
Resource Plan Phase 1 (Complete)
Resource Plan Phase 2
27
19
Siting Plan
10
Powerflow Model Development
15
Economic Model Development
27
Benchmarking
10
Constraint Assessment
Generator Outlet Facilities
15
WG Approval
Member Review/Feedback Period
Milestone Period

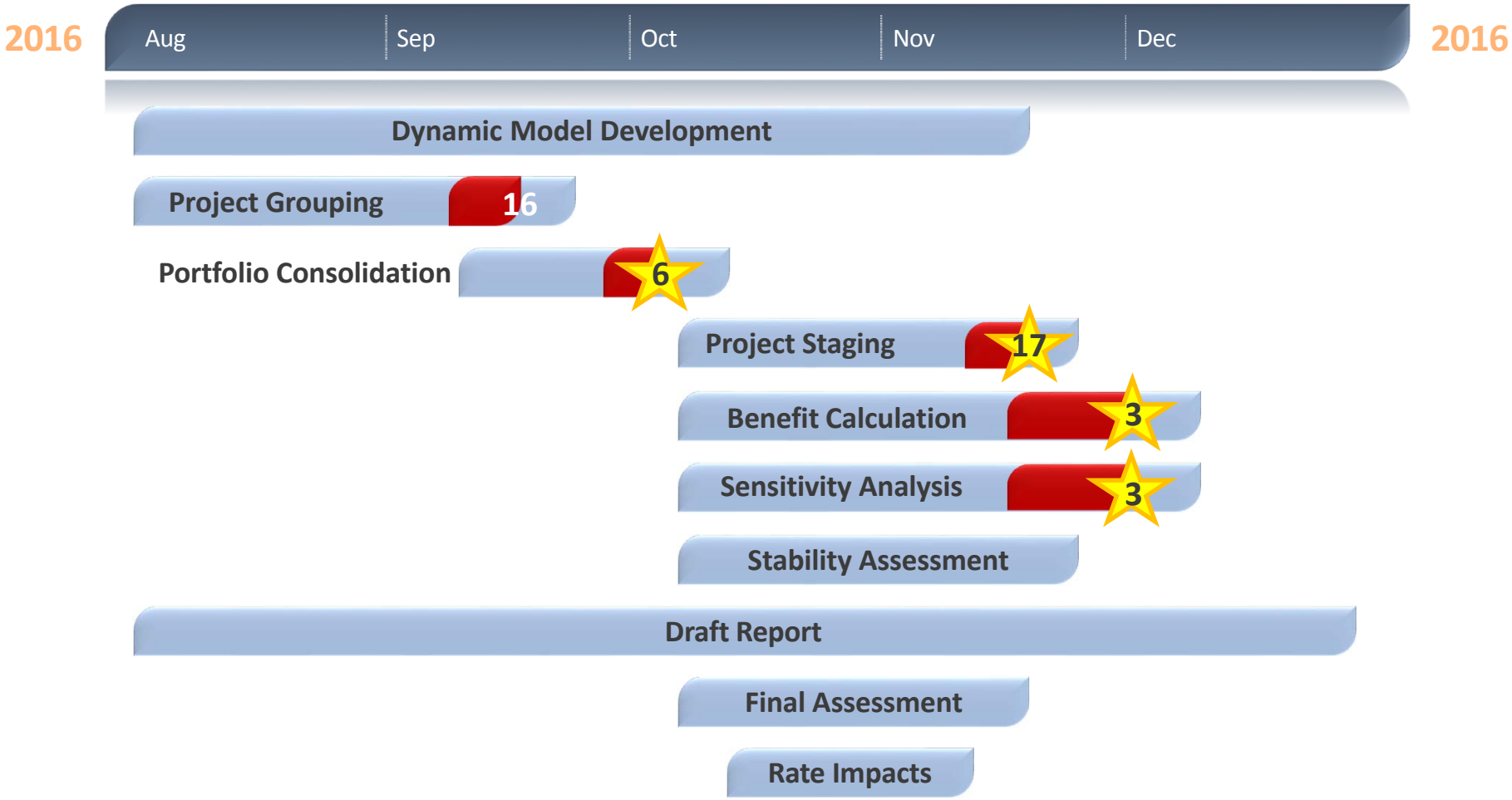


WG Approval

Member Review/Feedback Period

Milestone Period

Submission Deadline



WG 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		9/23/15
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		11/19/15
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).

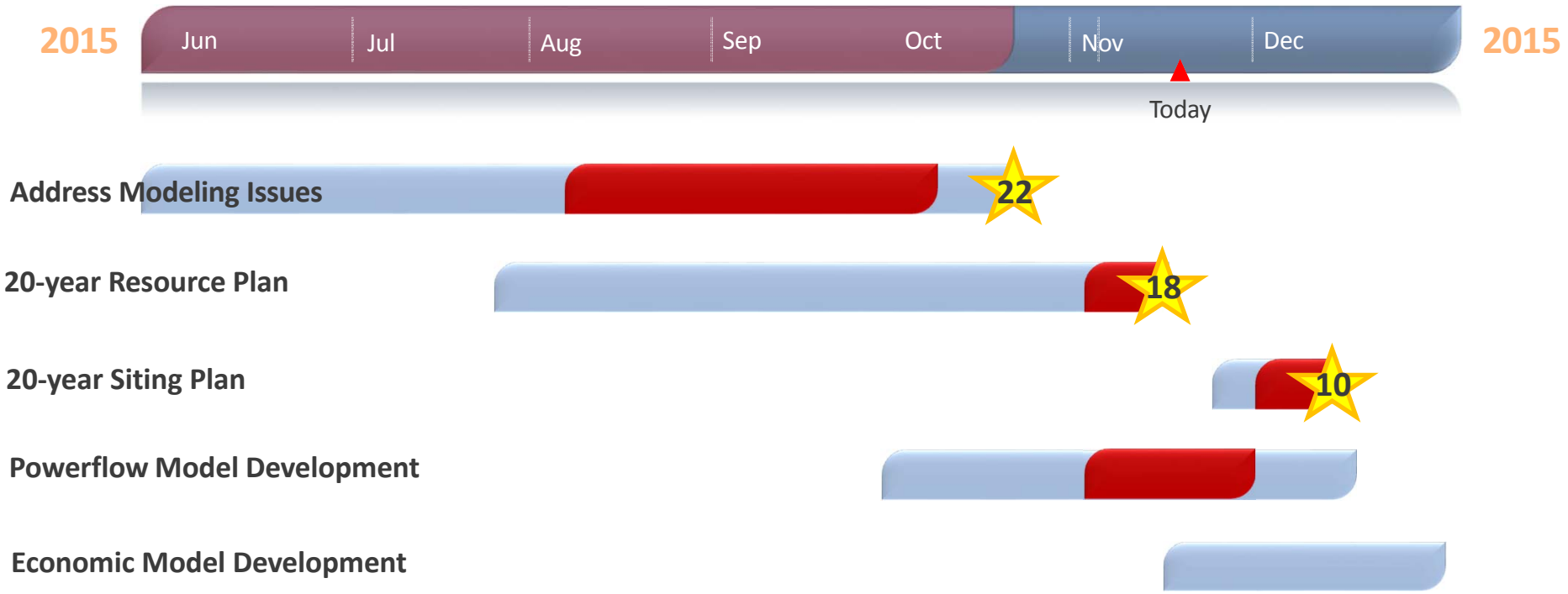
RCAR II Schedule

November 18th , 2015

ESWG

Juliano Freitas

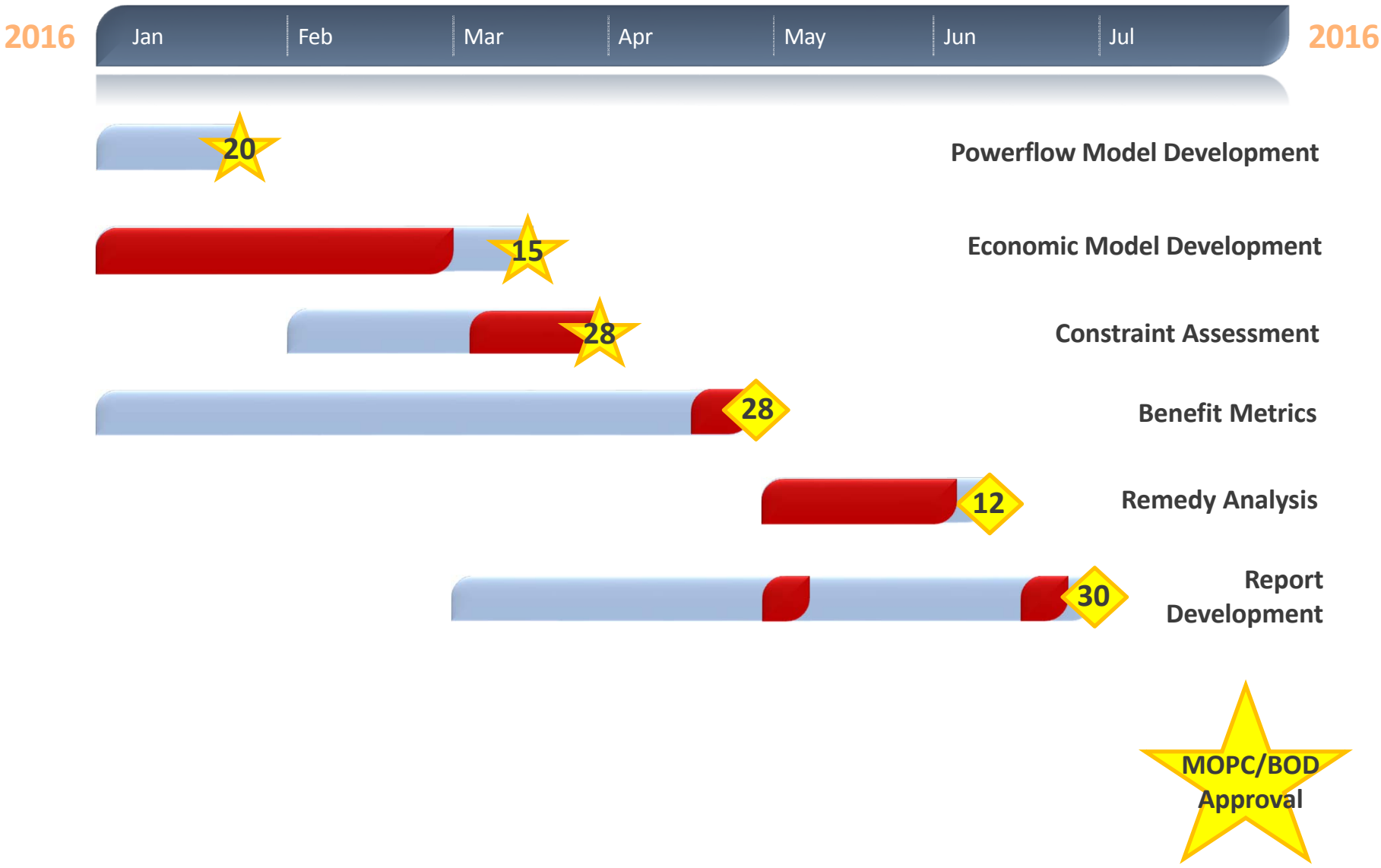
SPP Southwest Power Pool



WG Approval

Member Review/Feedback Period

Milestone Period


2016
Jan
Feb
Mar
Apr
May
Jun
Jul
2016
20
Powerflow Model Development
15
Economic Model Development
28
Constraint Assessment
28
Benefit Metrics
12
Remedy Analysis
30
Report Development
MOPC/BOD Approval
WG Approval
Member Review/Feedback Period
Milestone Period

RCAR II Milestone Schedule - Summary

Task Name	Start	Finish	Review Period	Feedback Cutoff	End of Milestone
Address Modeling Issues	**April '15**	**October '15**	Multiple Reviews	10/15/15	11/22/15
20-year Resource Plan	**July '15**	**November '15**	11/02/15 – 11/09/15	11/09/15	11/18/15
20-year Siting Plan	**October '15**	**December '15**	11/12/15 - 12/10/15	12/03/15	12/10/15
Powerflow Model Development	**October '15**	**January '16**	11/08/15 – 11/30/15	11/30/15	1/20/16
Economic Model Development	**November '15**	**March '16**	01/01/16 – 03/01/16	03/01/16	03/15/16
Constraint Assessment	**February '16**	**March '16**	03/03/16 – 03/17/16	03/17/16	03/28/16
Benefit Metrics	**January '16**	**April '16**	April '16		04/28/16
Remedy Analysis	**May '16**	**June '16**	May, June '16		06/12/16
Report Development	**March '16**	**June '16**	May, June '16		06/30/16
Study Concludes		**July '16**			Late July, 2016

Note: Most review period dates are subject to change based on future WG meeting schedules.

2017 ITP10 Resource Plan Phase 2

November 18th, 2015

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Resource Planning Simulations

- Model inputs
  - Load and generation review
  - Fuel prices
  - RP1 renewable units
  - Additional wind units
  - Utility scale and rooftop solar units
- Constraints
  - Zonal load requirements and generation capacity
  - Zonal capacity margin requirement (12%)

Resource Planning Simulations

- Study years 2020 – 2035
  - 2035 resource plan was developed for Future 3 for RCAR II
- Updates since last meeting
  - NG prices
  - Interchange structure – simulated region as a whole, rather than 4 separate sub-regions
  - Several small updates, mostly based on member feedback
- All resource planning data is posted on TrueShare
  - ITP – Confidential.... -> 2017 ITP10 -> Resource Planning Data ->

Natural Gas Price Update

- **Previous methodology: NYMEX futures and DOE growth rates**
- **New methodology: ABB Reference Case**
- **Henry Hub comparison:**

	Previous ($/MMBtu)	New ($/MMBtu)
2019	$3.55	$5.66
2020	$3.66	$6.03
2021	$3.79	$6.42
2022	$3.93	$6.65
2023	$4.06	$6.83
2024	$4.19	$7.05
2025	$4.35	$7.26
2026	$4.54	$7.51
2027	$4.73	$7.76
2028	$4.90	$8.09
2029	$5.15	$8.31
2030	$5.48	$8.77
2031	$5.72	$9.12
2032	$6.02	$9.63
2033	$6.36	$10.24
2034	$6.64	$10.83
2035	$6.96	$11.57

(nominal $)

Unit Retirements, by Year

- **Based on Generation Review, recent feedback**

Retirements (MW)	2020	2025	2035
Coal	3,096	3,944	5,091
Nuclear	0	0	588
Gas	1,583	2,719	5,986
Oil	25	51	346
Other	3	3	28
TOTAL	4,708	6,717	12,995

FUTURE 3

F3 Renewable Resources in SPP

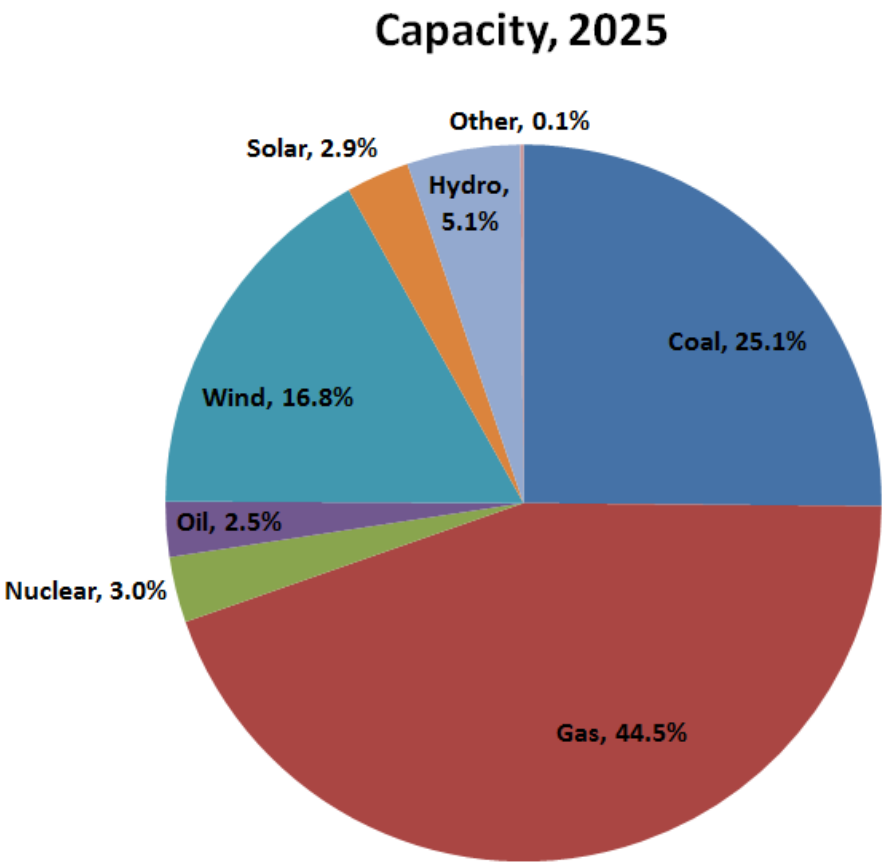
F3 Wind (MW)

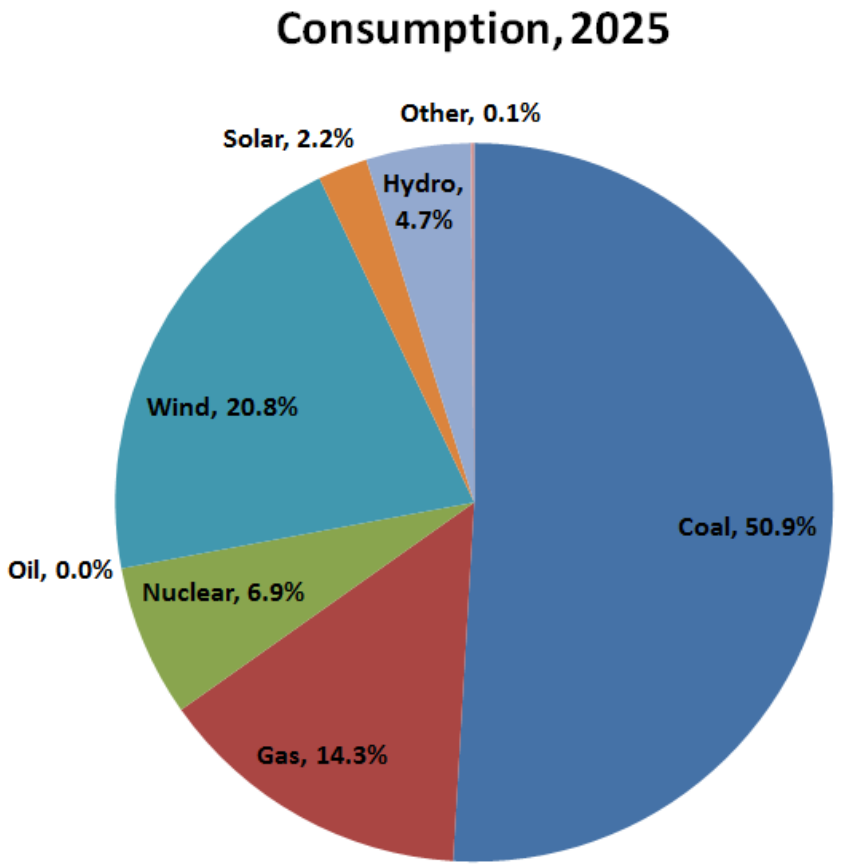
	2020	2025	2035
Existing Wind - from Gen Review	12,486	12,486	12,236
RP1 wind added to meet mandates/goals	233	337	337
RP2 - forced wind	2,669	2,870	3,844
Total Wind	**15,387**	**15,693**	**16,417**

F3 Solar (MW)

	2020	2025	2035
Existing Solar - from Gen Review	190	190	190
RP1 solar added to meet mandates/goals	21	38	38
RP2 - forced utility scale and rooftop solar	856	2,441	4,845
Total Solar	**1,067**	**2,669**	**5,073**

F3 Capacity and Energy Consumption

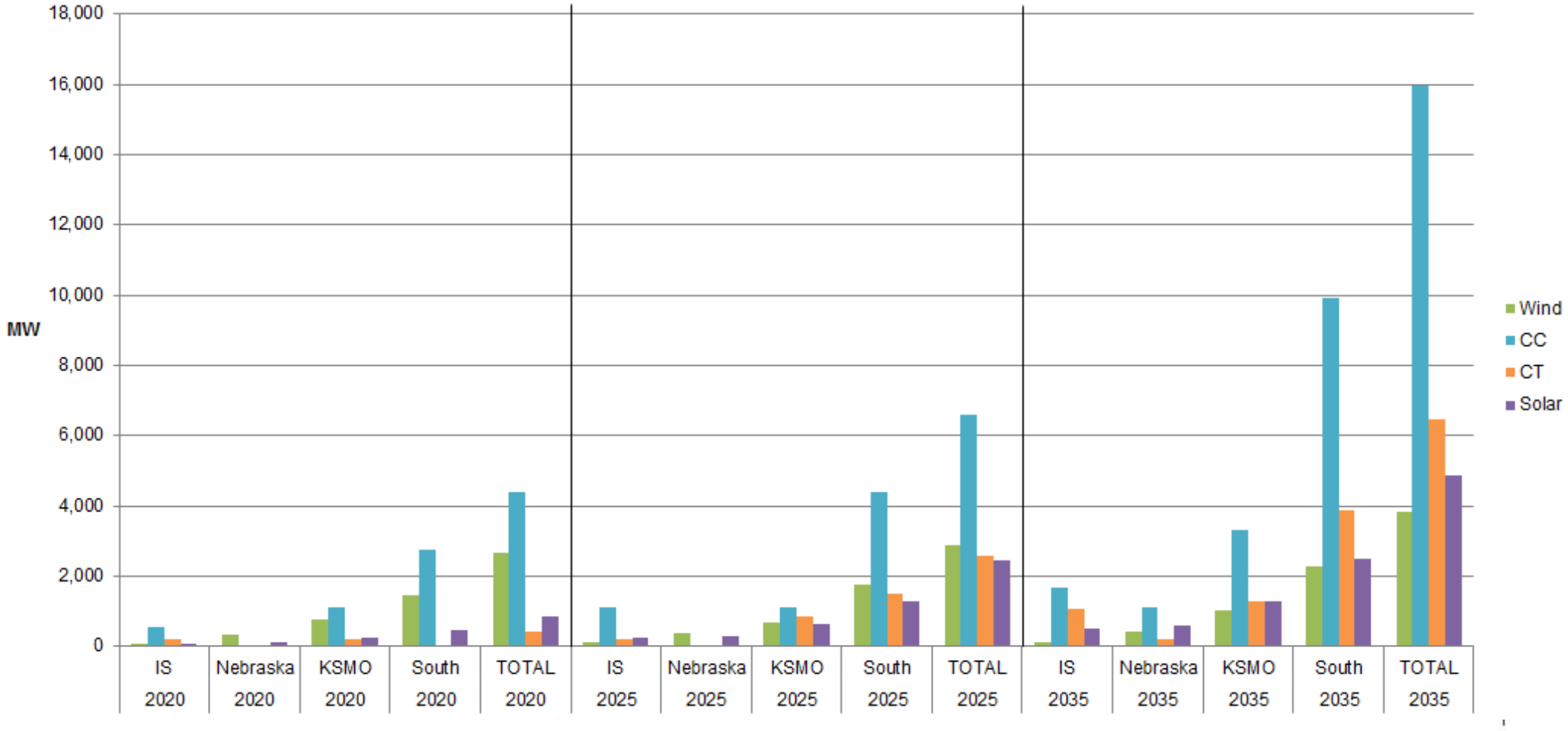




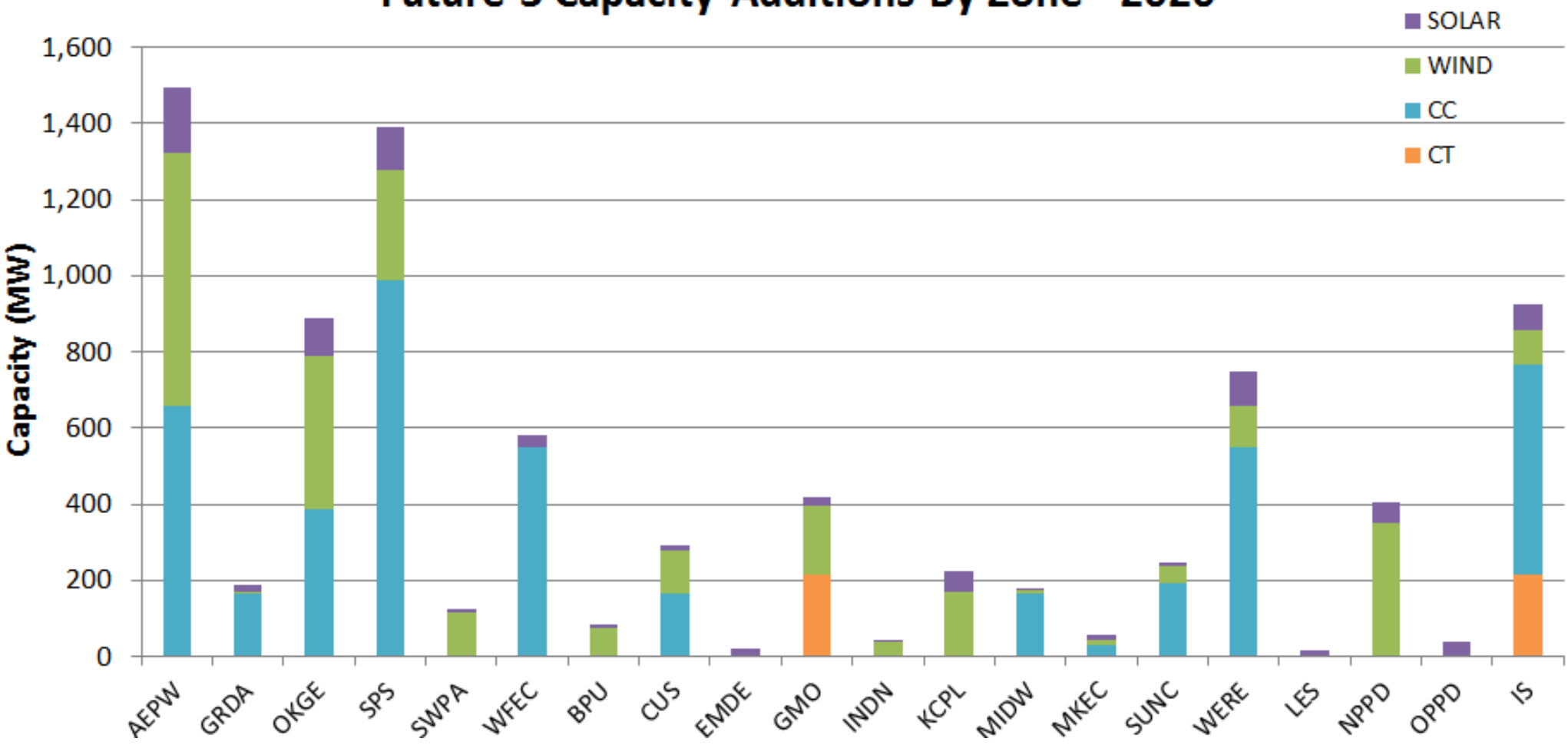
Future 3 Resource Additions

Cumulative Additions

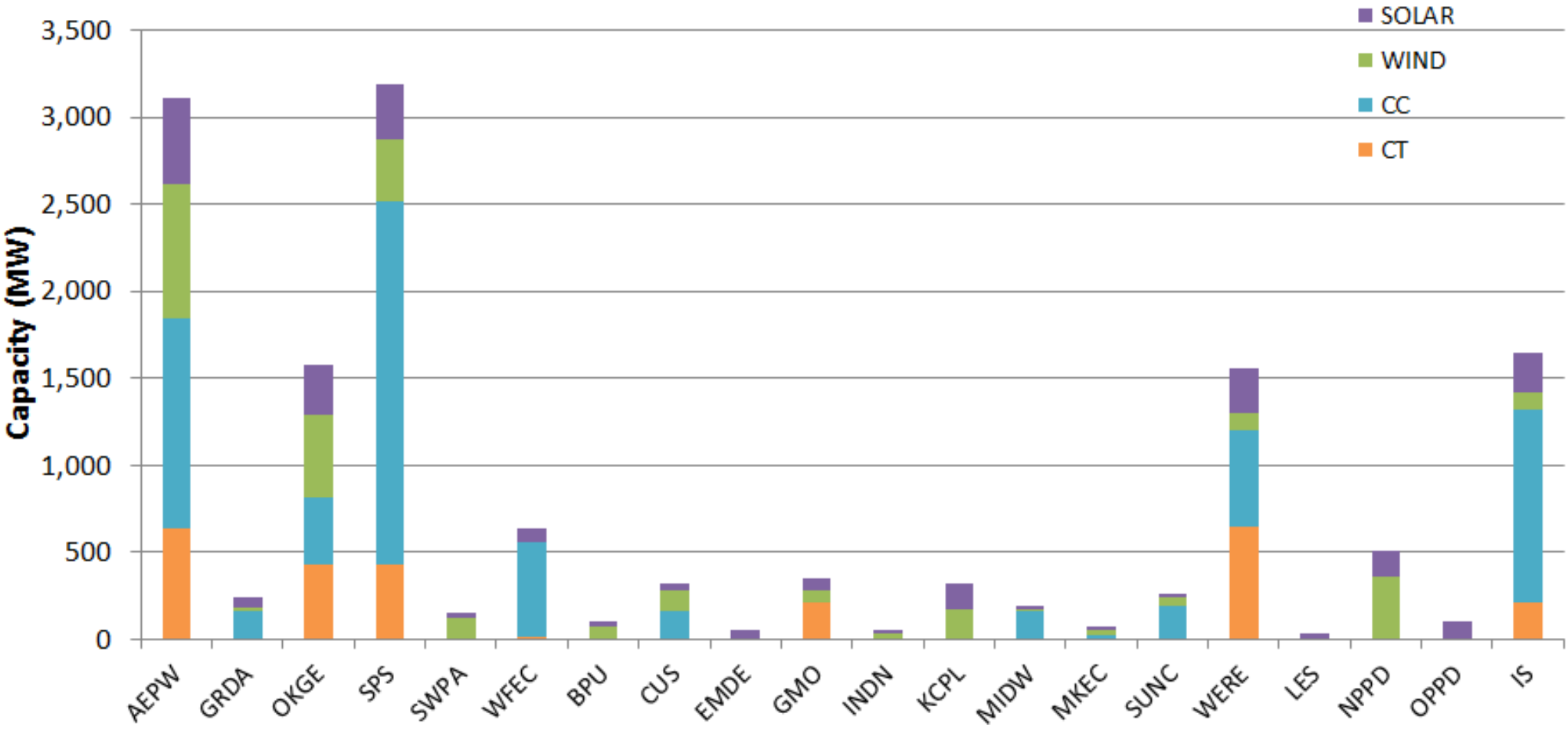
	Conventional MW	Renewable MW	Total MW
2020	4,832	3,525	8,357
2025	9,192	5,311	14,503
2035	22,430	8,689	31,119



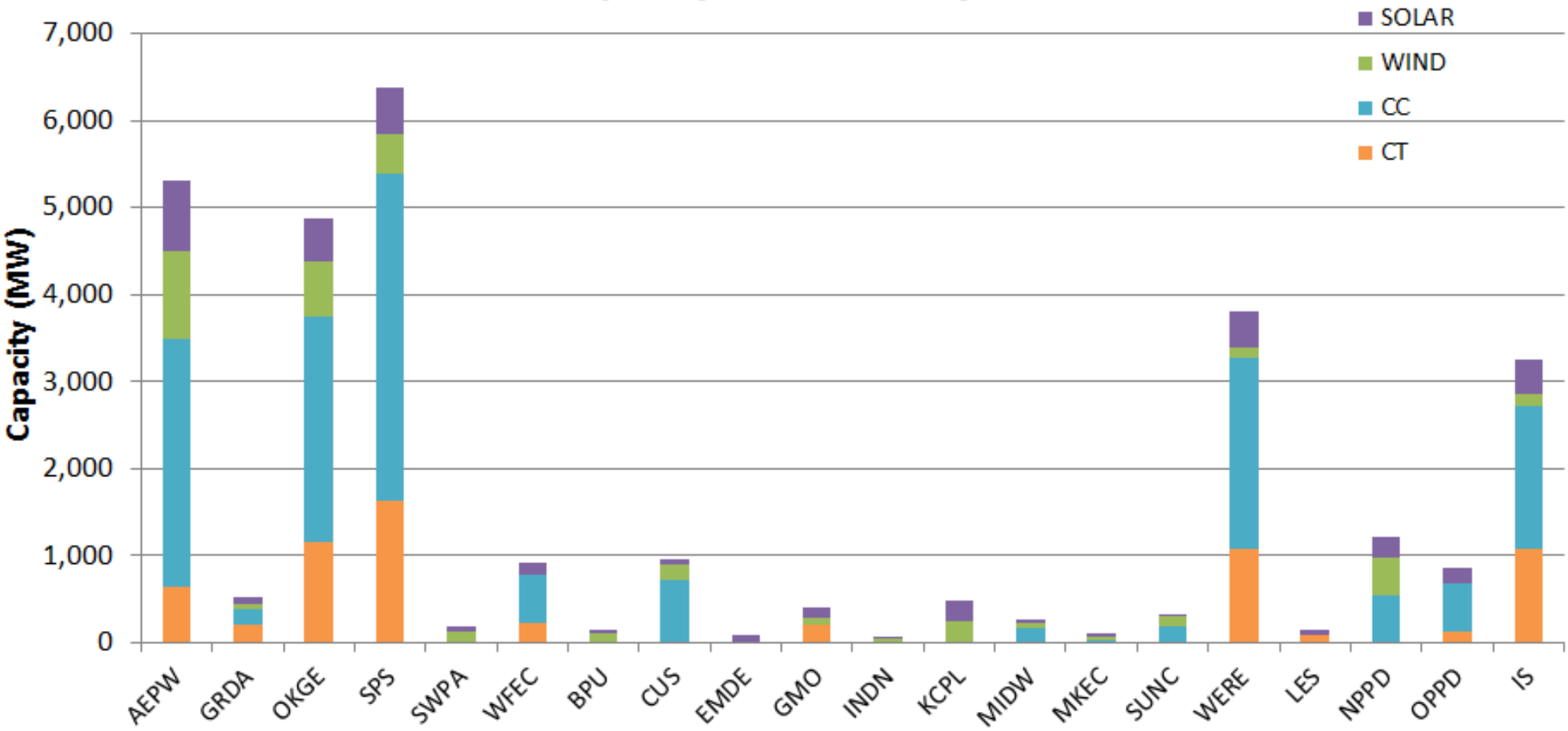
Future 3 Capacity Additions By Zone - 2020



Future 3 Capacity Additions By Zone - 2025



Future 3 Capacity Additions By Zone - 2035



Recommendation

- **SPP Staff recommends ESWG approve the current draft of the 2017 ITP10 Resource Plan Phase 2 for Future 3**

FUTURE 1

Future 1 Compliance Assumptions

- Incremental wind and solar (see next slide)
- Graduated carbon cost adder to meet emission targets
  - $15-$25 (2015$) from 2020 – 2030
  - EPA Targets
    - 2020: 2022-2025 interim average
    - 2025: 2025-2027 interim average
    - 2030: 2030 final goal
- Incremental retirements
  - 2,329 MW by 2025
  - Based on approved methodology of age and CF operation

Future 1 Resource Additions

Cumulative Additions (MW)

	2020	2025
Conventional	6,600	10,666
Renewable	6,369	8,045
Total	**12,969**	**18,711**

F1 Wind (MW)

	2020	2025
Existing Wind - from Gen Review	12,486	12,486
RP1 wind added to meet mandates/goals	233	337
RP2 - forced wind	4,639	4,955
Total Wind	**17,357**	**17,778**

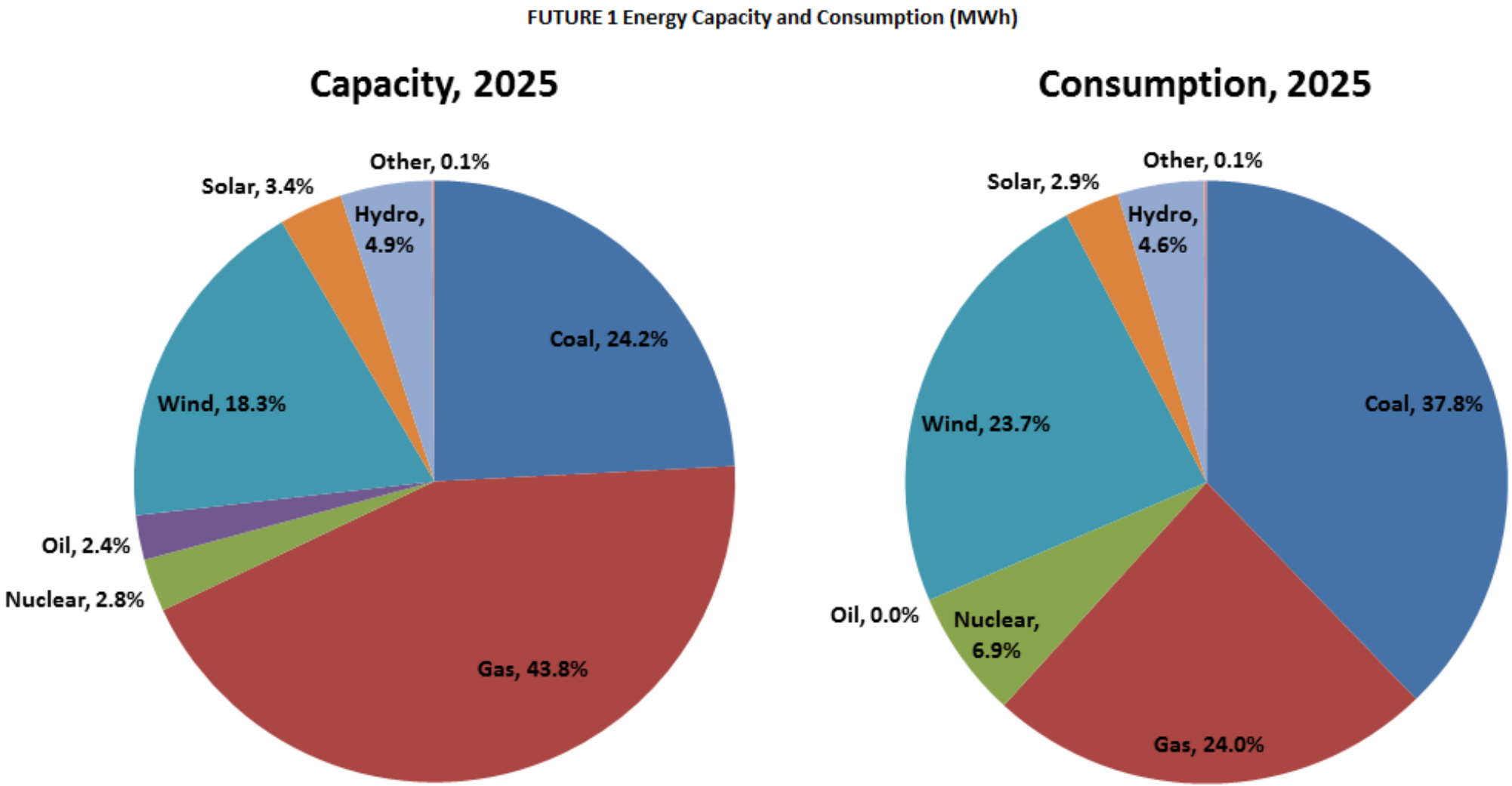
F1 Solar (MW)

	2020	2025
Existing Solar - from Gen Review	190	190
RP1 solar added to meet mandates/goals	21	38
RP2 - forced utility scale and rooftop solar	1,730	3,090
Total Solar	**1,941**	**3,318**

F3/F1 Renewables Comparison

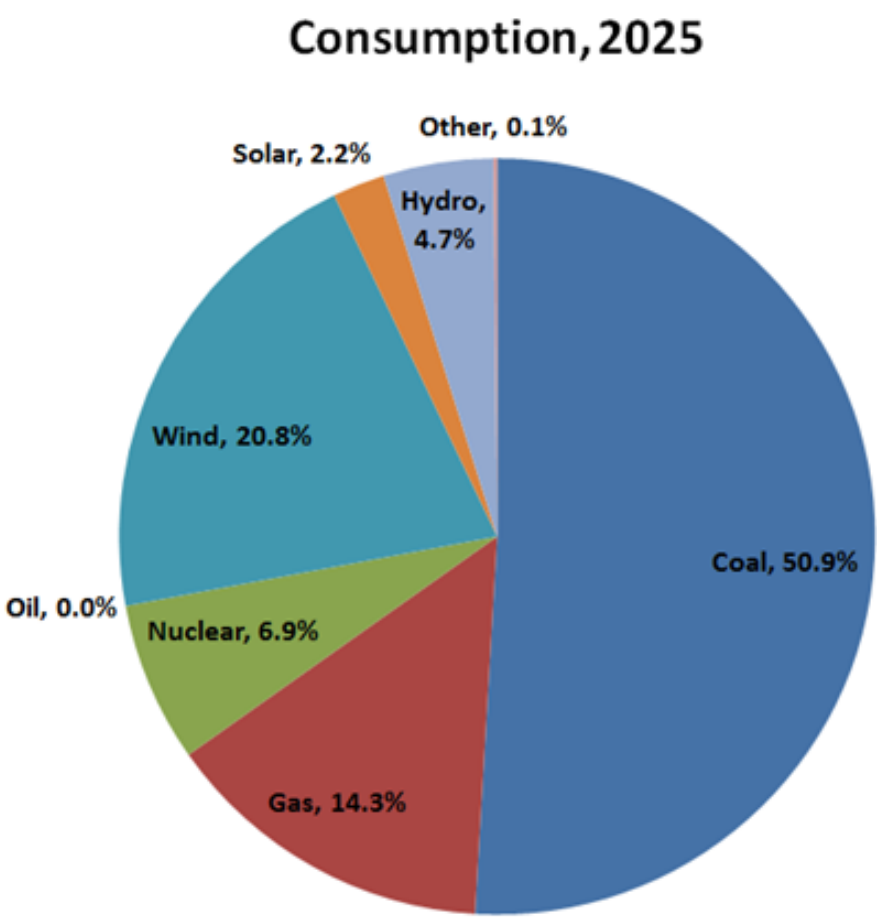
	2020	2025	2035
F3 Total Wind (MW)	15,387	15,693	16,417
F1 Total Wind (MW)	17,357	17,778	N/A
F3 Total Solar (MW)	1,067	2,669	5,073
F1 Total Solar (MW)	1,941	3,318	N/A

F1 Capacity and Energy Consumption

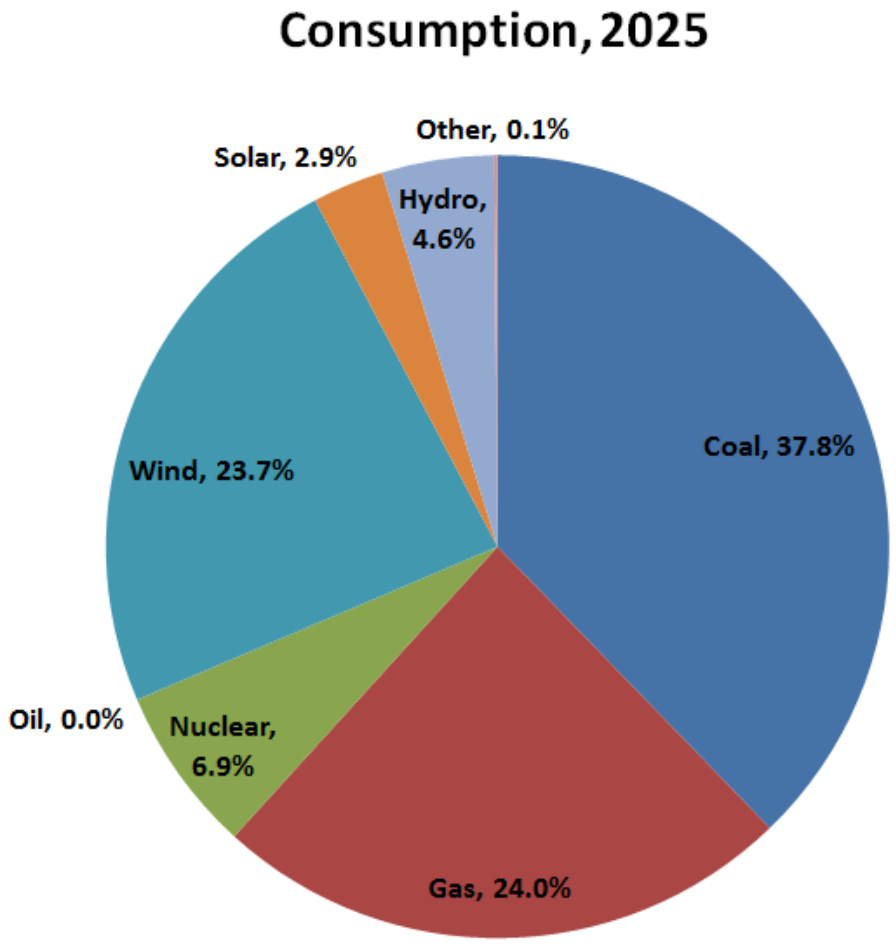


F3/F1 Consumption Comparison

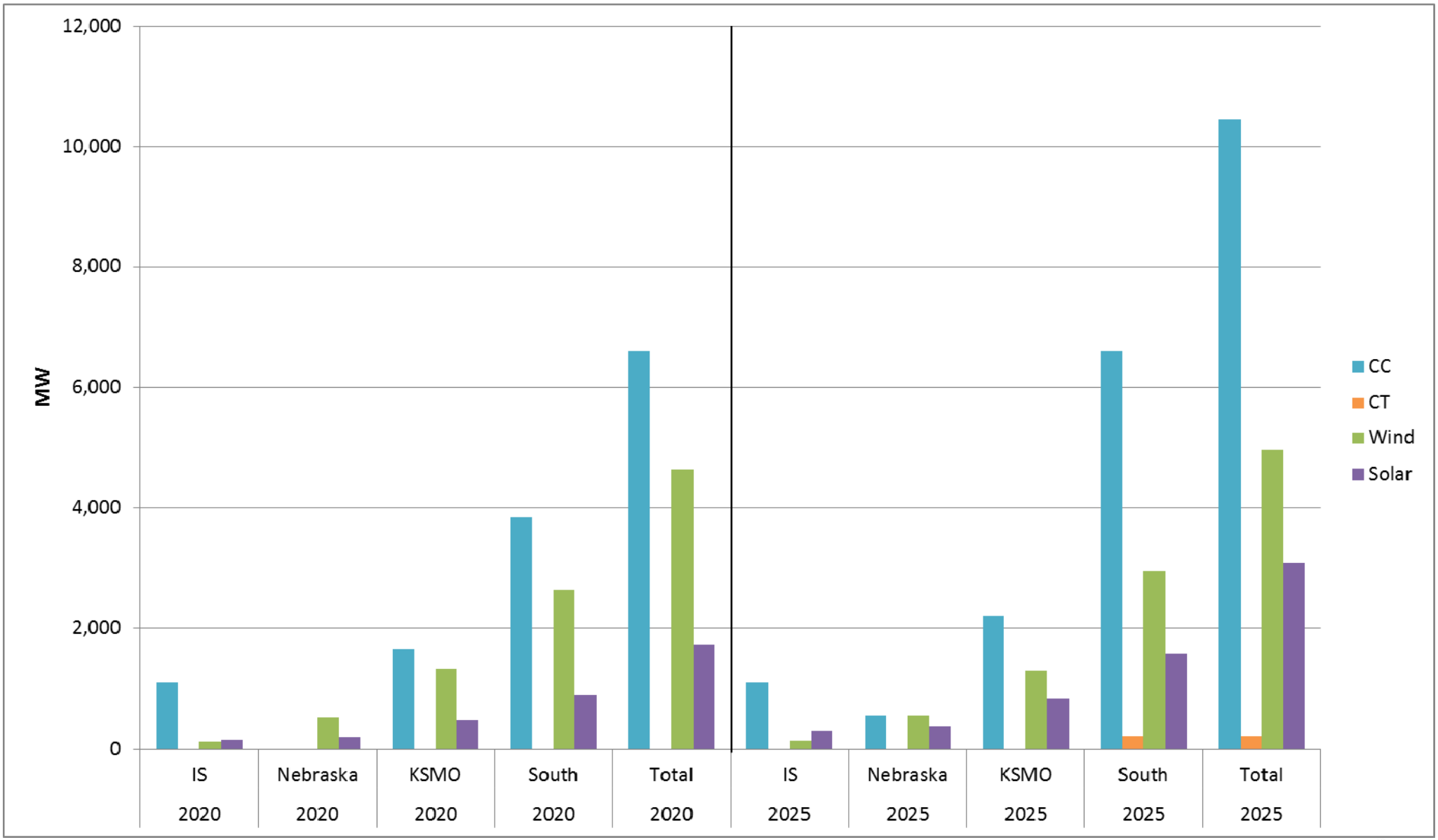
- **Future 3**



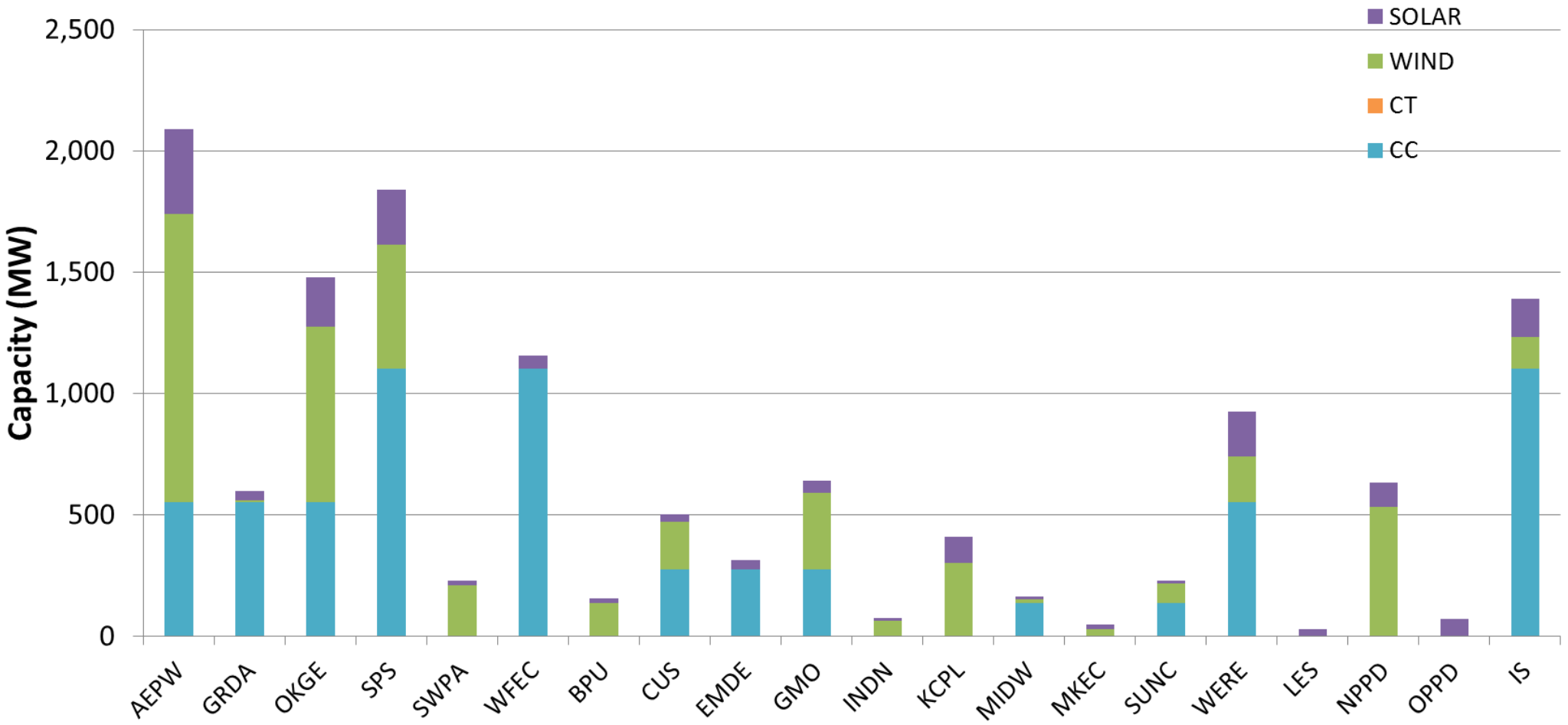
- **Future 1**



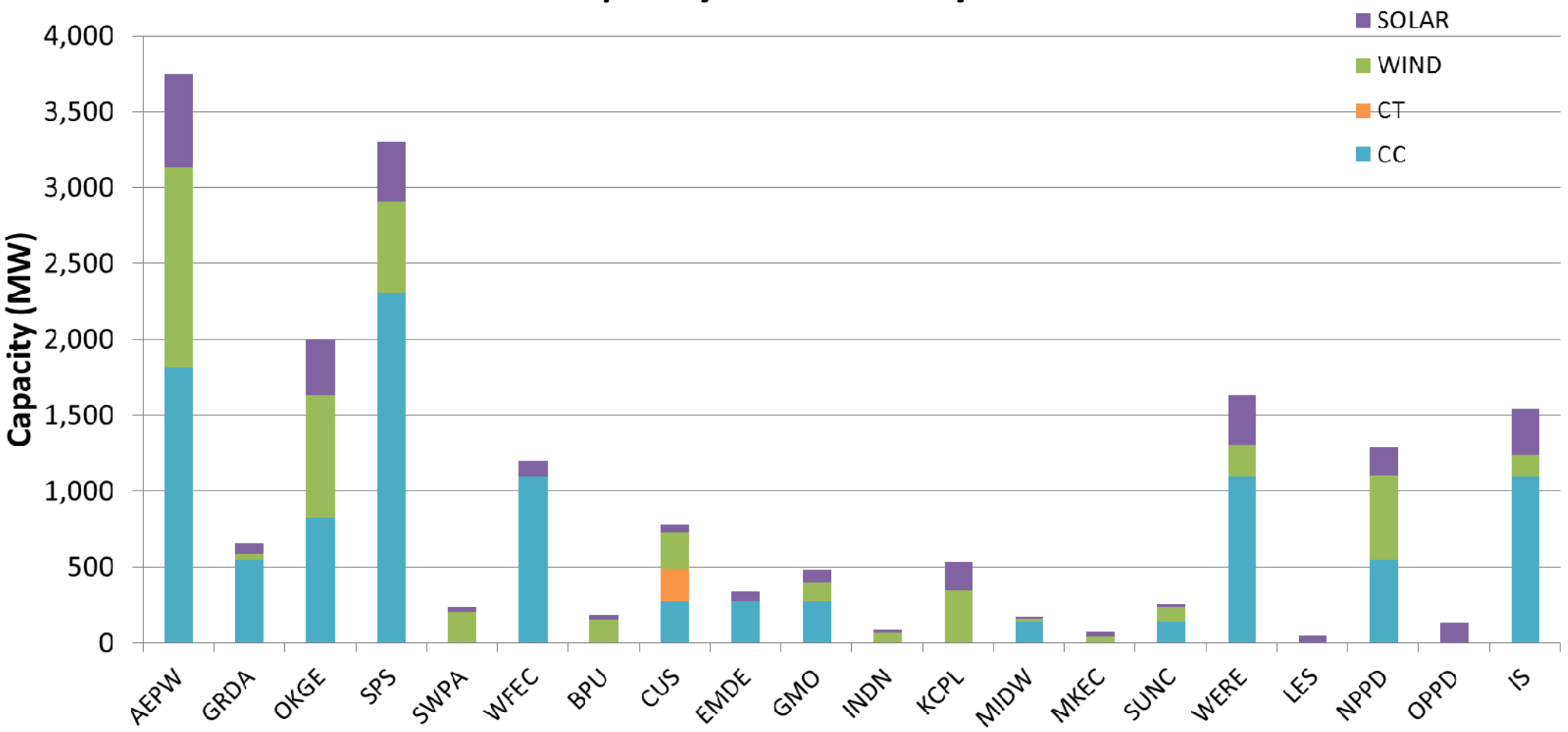
Future 1 Resource Additions



Future 1 Capacity Additions By Zone - 2020



Future 1 Capacity Additions By Zone - 2025



Recommendation

- **SPP Staff recommends ESWG approve the current draft of the 2017 ITP10 Resource Plan Phase 2 for Future 1**

2017 ITP10 Resource Plan Future 2

November 18th, 2015

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FUTURE 2

Future 2 Resource Planning Assumptions

- Islanding method
- Demand groups by Utility by State using bus level information from Islanding Method
- Model inputs
  - Load and generation review
  - Fuel prices
  - RP1 renewable units (387 MW in 2025)
  - Additional wind units (15.3 GW in 2025)
    - 4.8GW SPP, 10.5 GW external
  - Utility scale solar units (5.9 GW in 2025)
    - 3.1GW SPP, 2.8 GW external

Future 2 Resource Planning Assumptions

- **Model changes for F2**
  - **State structure** (13 states - Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Montana, Nebraska, North Dakota, New Mexico, Oklahoma, South Dakota, and, Texas)
    - Utility Load by state includes non-SPP utilities
    - No emissions "trading" – no interstate interchange of conventional fossil generation
    - Existing zero-emitting resources (Hydro, Nuclear, Wind, and Solar) allocated to states on a load ratio share
  - Non-SPP MISO MTEP 15 resource plan for wind and solar

Future 2 Resource Planning Assumptions

- Some inputs were not considered due to emissions "trading" restriction
  - DC tie imports/exports and interstate PPAs removed
- Existing renewables aggregated due to modeling restrictions
  - Unit for each utility in each state
  - Removed renewables delivered out of state
- Future (RP2) renewables and all SWPA/WAPA hydro aggregated into one unit per state
  - Ownership breakdown by utility by state

Future 2 Resource Planning Simulations

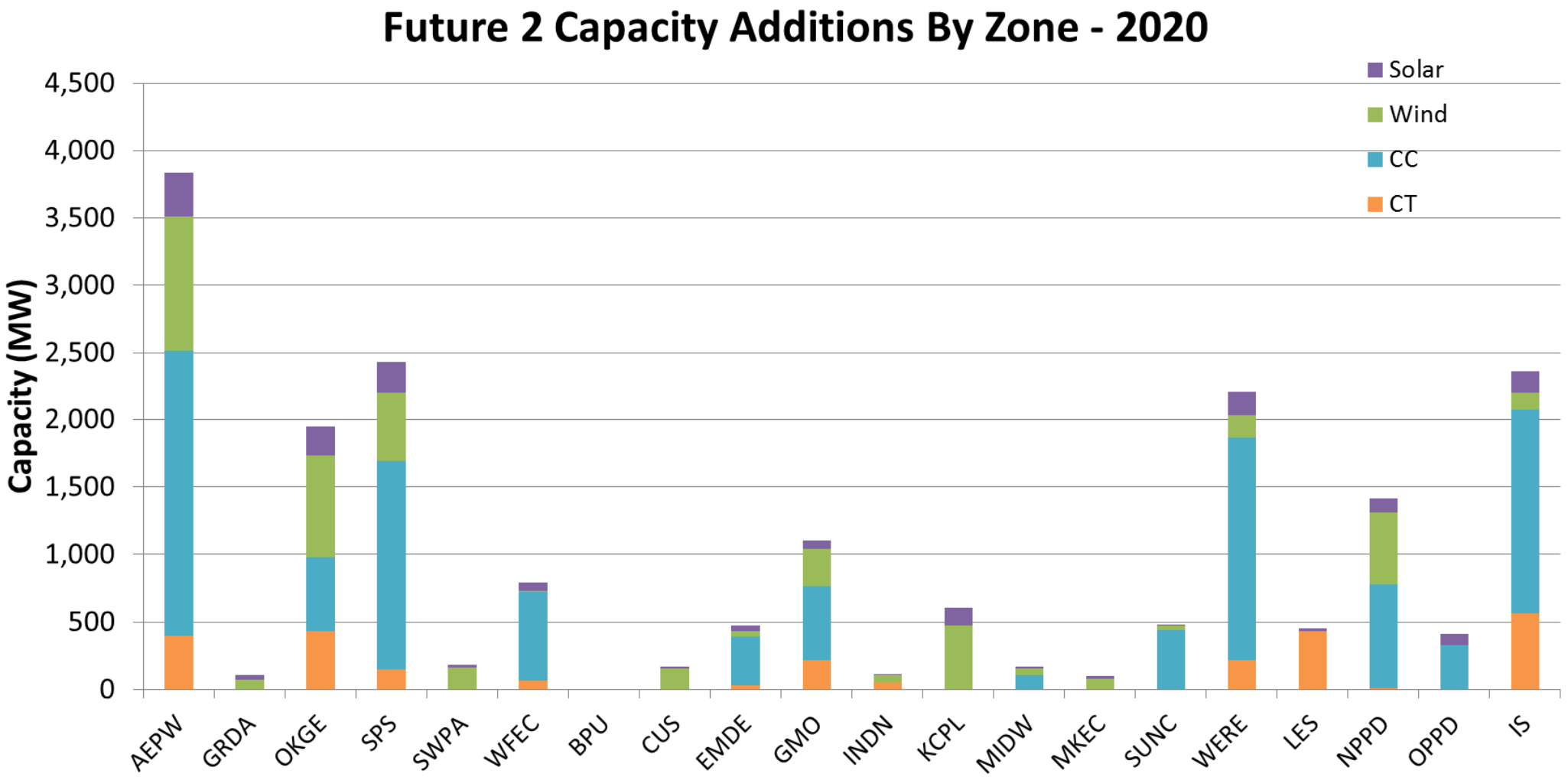
- Constraints
  - Assess by utility by state load and generation capacity
  - Assess state emissions
    - State by State carbon cost adder
  - “Zonal” capacity margin requirement (12%)
  - Allocation issues
- Retirement or no retirements

Data Input Summary

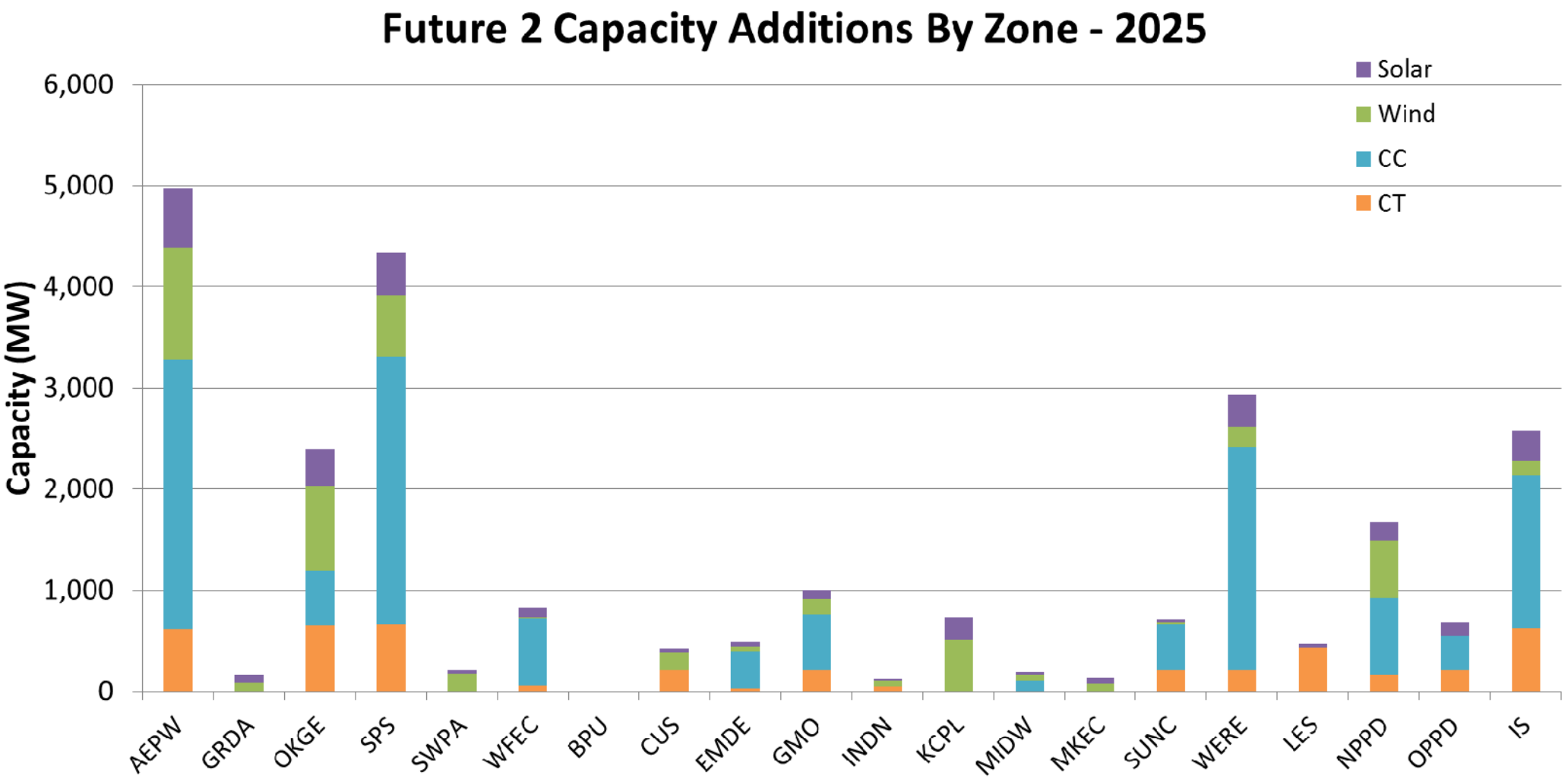
State	State Abbrev.	Carbon Tax (2015$) (2020/2025/2030/2035)	Coal Retirements (MW)	2025 Existing Wind (MW)	2025 Forced Wind (MW)	2025 Existing Solar (MW)	2025 Forced Solar (MW)	Hydro (MW)
Arkansas	AR	0/17/31/31	0	469.6	2776.0	1.9	652.8	27.0
Iowa	IA	0/0/30/30	595	5870.3	195.0	57.3	449.4	400.9
Kansas	KS	23/25/27/27	460	2176.3	755.0	0.3	549.1	18.3
Louisiana	LA	0/0/26/26	0	277.5	4399.0	0.0	933.0	0.0
Minnesota*	MN	180/180/275/275	2,640	4126.5	323.0	321.8	278.9	403.0
Missouri	MO	0/0/25/25	534	1921.9	2924.0	11.2	827.0	0.0
Montana	MT	0/0/0/0	0	194.6	0.0	0.0	20.7	105.7
Nebraska	NE	0/0/0/0	509	1626.5	556.0	0.0	390.8	894.6
New Mexico*	NM	0/0/0/0	0	725.8	108.0	80.4	116.8	0.0
North Dakota	ND	0/0/32/32	857	1683.4	44.0	56.9	146.9	332.7
Oklahoma	OK	0/0/0/0	0	3332.4	1383.0	0.1	785.6	53.7
South Dakota	SD	0/0/0/0	471	699.5	62.0	28.5	103.3	421.0
Texas	TX	0/0/25/25	0	1857.2	1851.0	154.1	655.6	0.0

*Not meeting compliance in current results

Zonal Capacity Additions – 2020

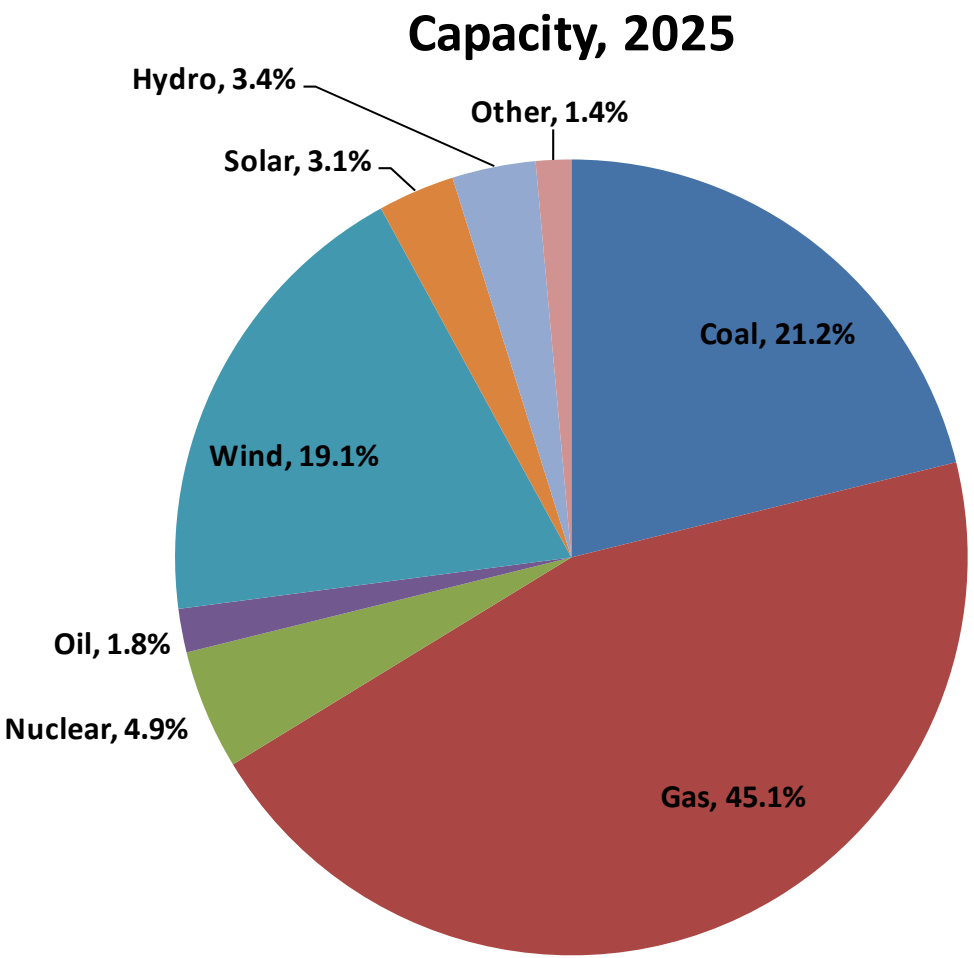


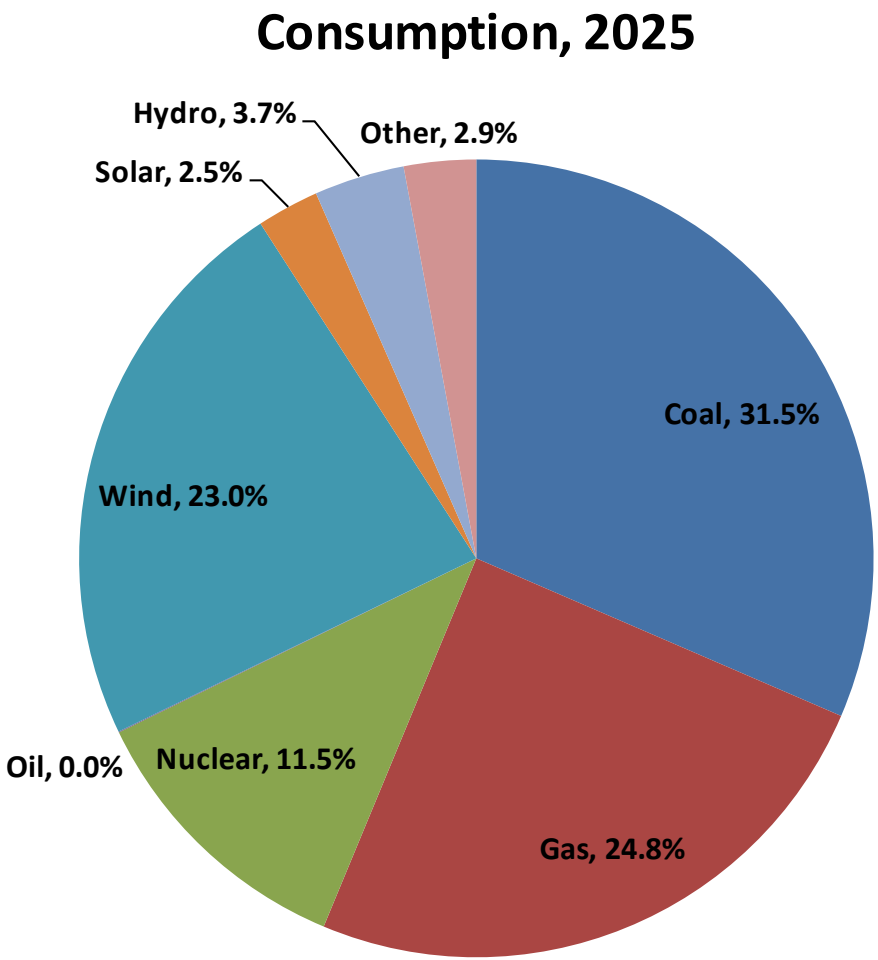
Zonal Capacity Additions – 2025



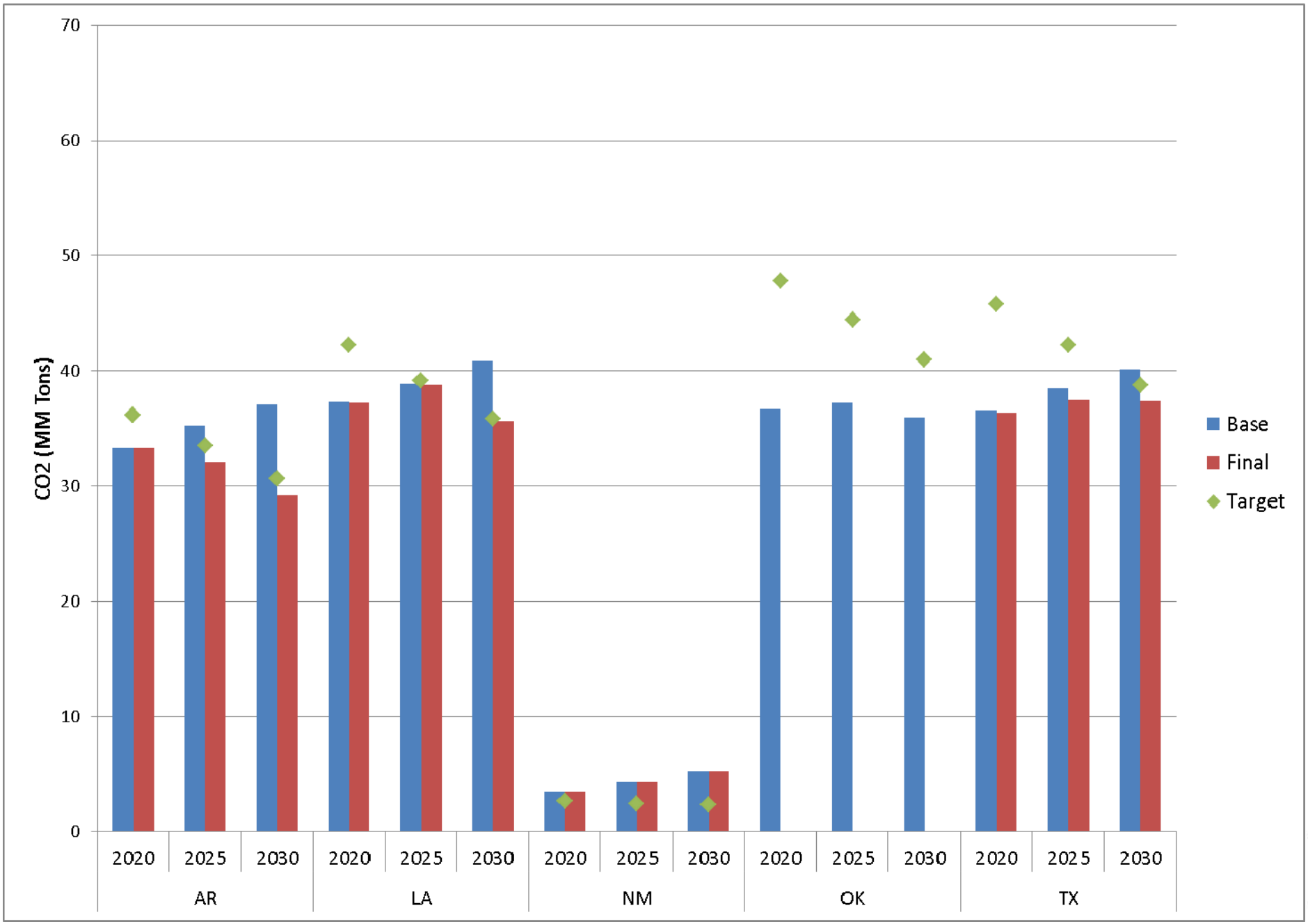
Capacity and Energy Consumption – 2025

FUTURE 2 Capacity and Energy Consumption (MWh)

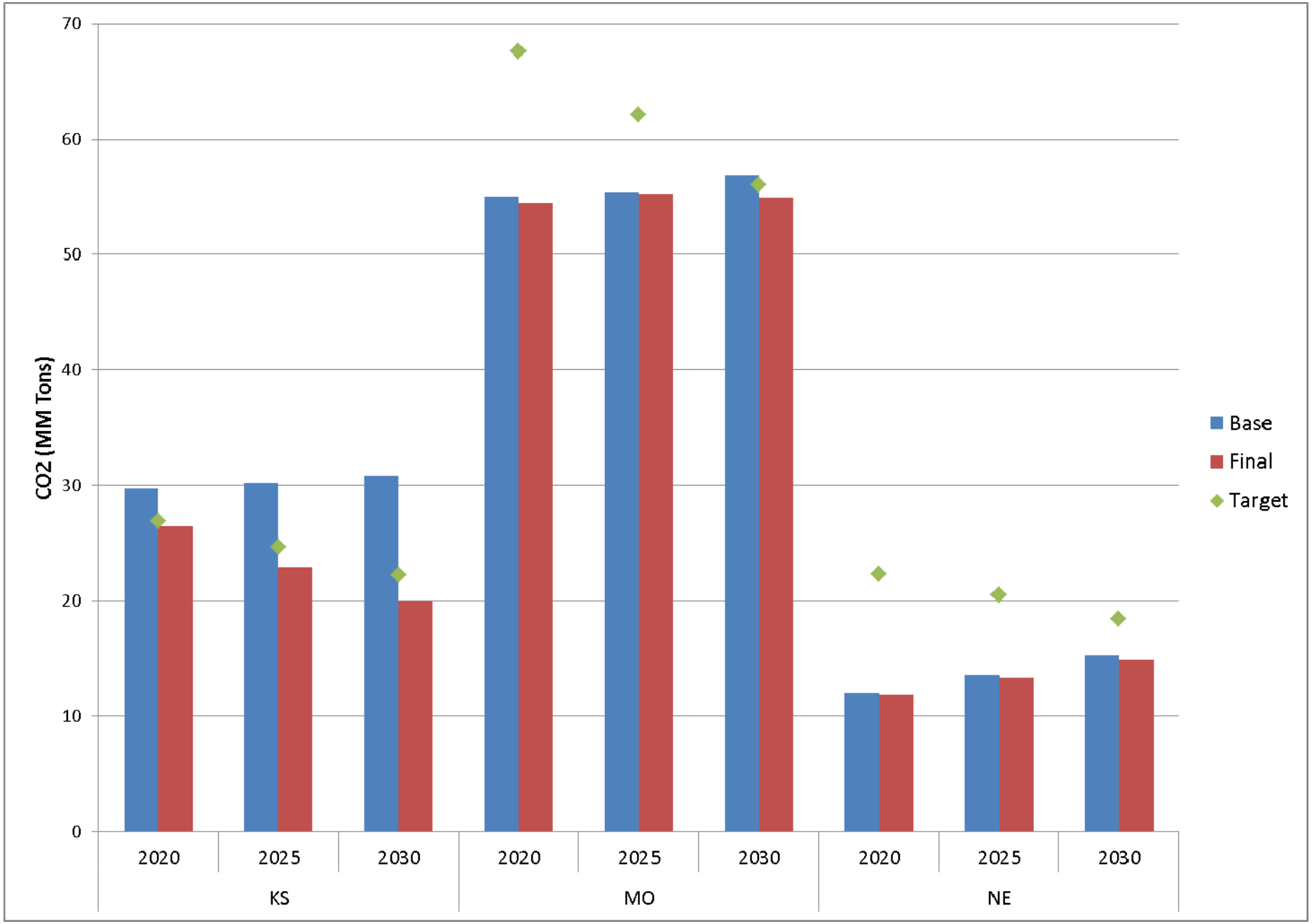




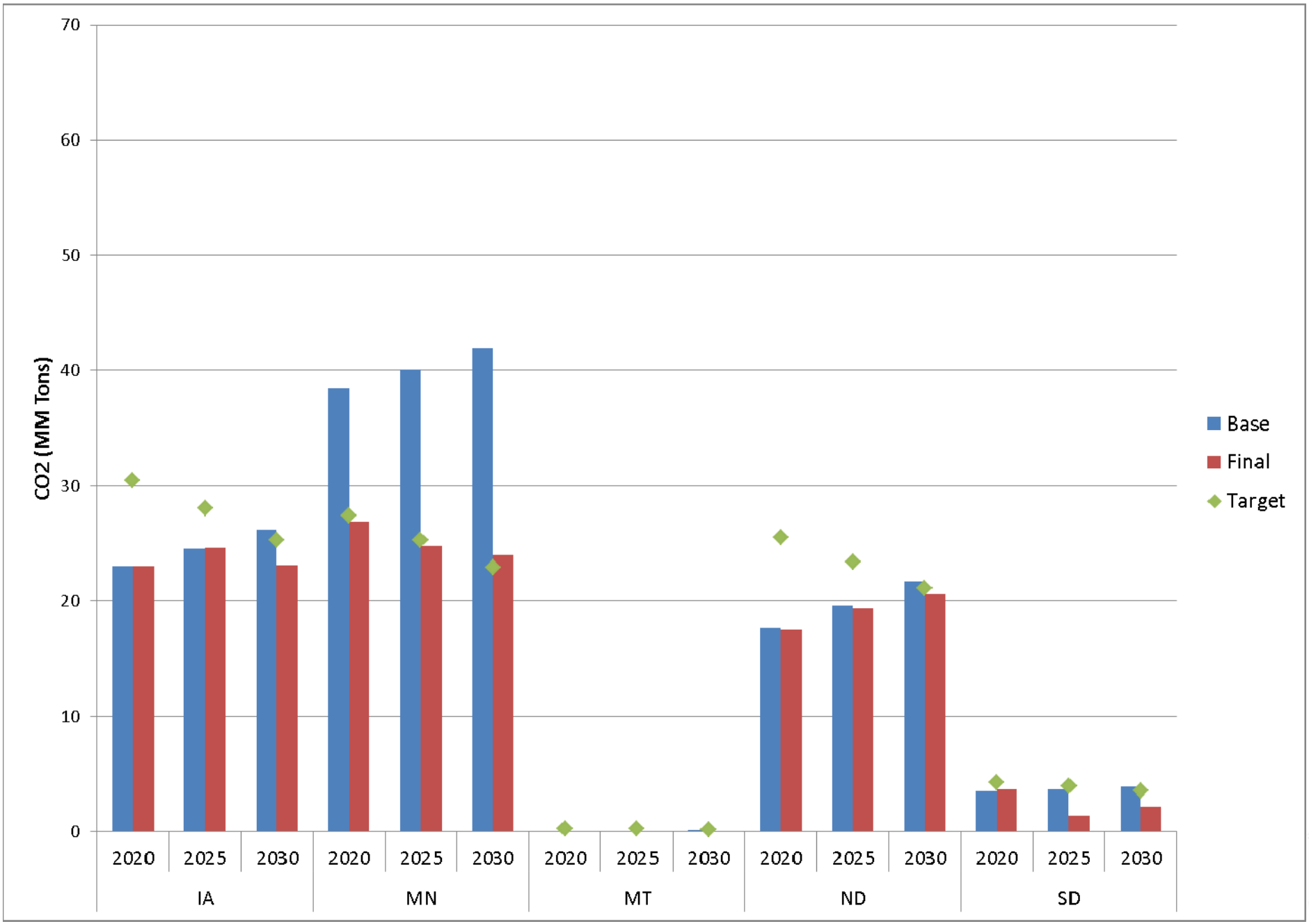
Emission Summary – South



Emission Summary – KS/MO/NE



Emission Summary – UMZ



Outstanding Issues/Questions

- Hydro units associated with transactions and some solar units were inadvertently allocated to incorrect areas with varying impacts to different states
- Laramie River allocated based on contracts but left out of emissions goal calculations
- Reserve margin set too high for Minnesota, resulting in too many units being added
- Minnesota missing Manitoba Hydro allocations

Outstanding Issues/Questions

- Interconnection assumptions
  - Main impact to NM/TX/MT
  - Calculated Eastern Interconnection portion of emissions target
- New Mexico not meeting mass target. Based on overlap with other interconnections may investigate rate-based compliance.
- Move existing wind which is largest piece of zero-emitting energy (New Mexico and Texas)
- Not all “zones” in Missouri met the required capacity margin

Outstanding Issues/Questions

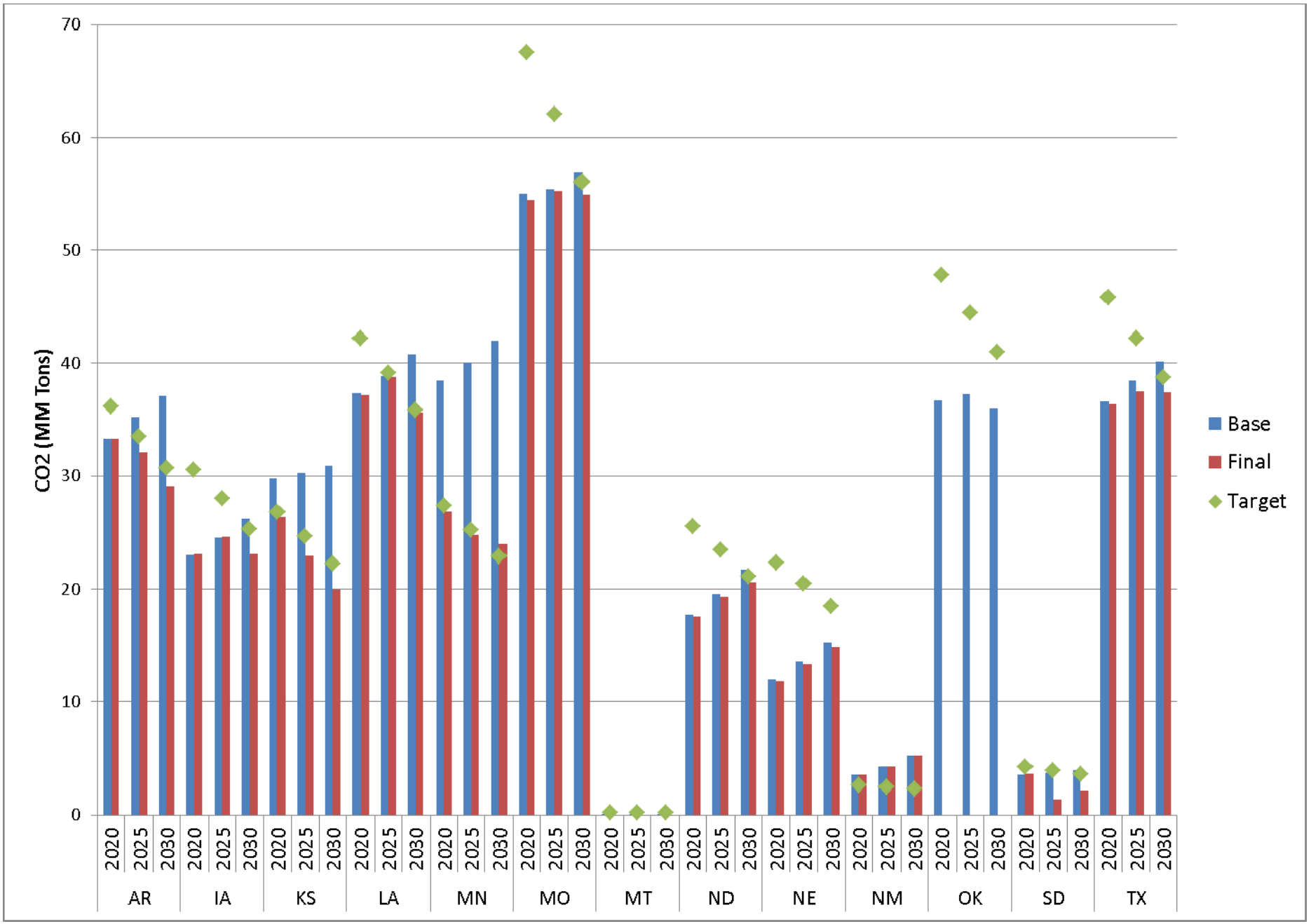
- External forced wind levels may be difficult to reach
- Resource adequacy questions
  - Ownership of generation by states not simulated
  - Ownership of generation out of state
  - By utility by state reserve margin
  - Import/export restriction
- Retirements
- Renewables

Next Steps

- Continue with state structure
  - QA and make adjustments
  - Glean retirements and carbon price
- Utilize retirements from state structure in regional structure
- Develop resource plan with assumed F1 retirements and retirements gleaned from state structure
- Incorporate resource plan into PROMOD
- Utilize PROMOD to determine carbon prices by state

APPENDIX

Emission Summary



2017 ITP10 Resource Plan Phase 2

November 18th, 2015

SPP Southwest Power Pool

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EXTERNAL

External Resource Plan

- Leverage MTEP 16 for MISO in F3
- Non-MISO F3 Conventional: add CC/CT comparable to existing base load/peaking unit ratio for each system, leverage MTEP 16 to inform
- F1/F2 Conventional
  - Utilize PROMOD to determine baseline emissions
  - Employ similar methodology as used for SPP system to determine carbon cost adder, and retirements
- F1/F2 Renewables – determine reasonable additions
- Opportunity for tier 1 review

External Resource Plan

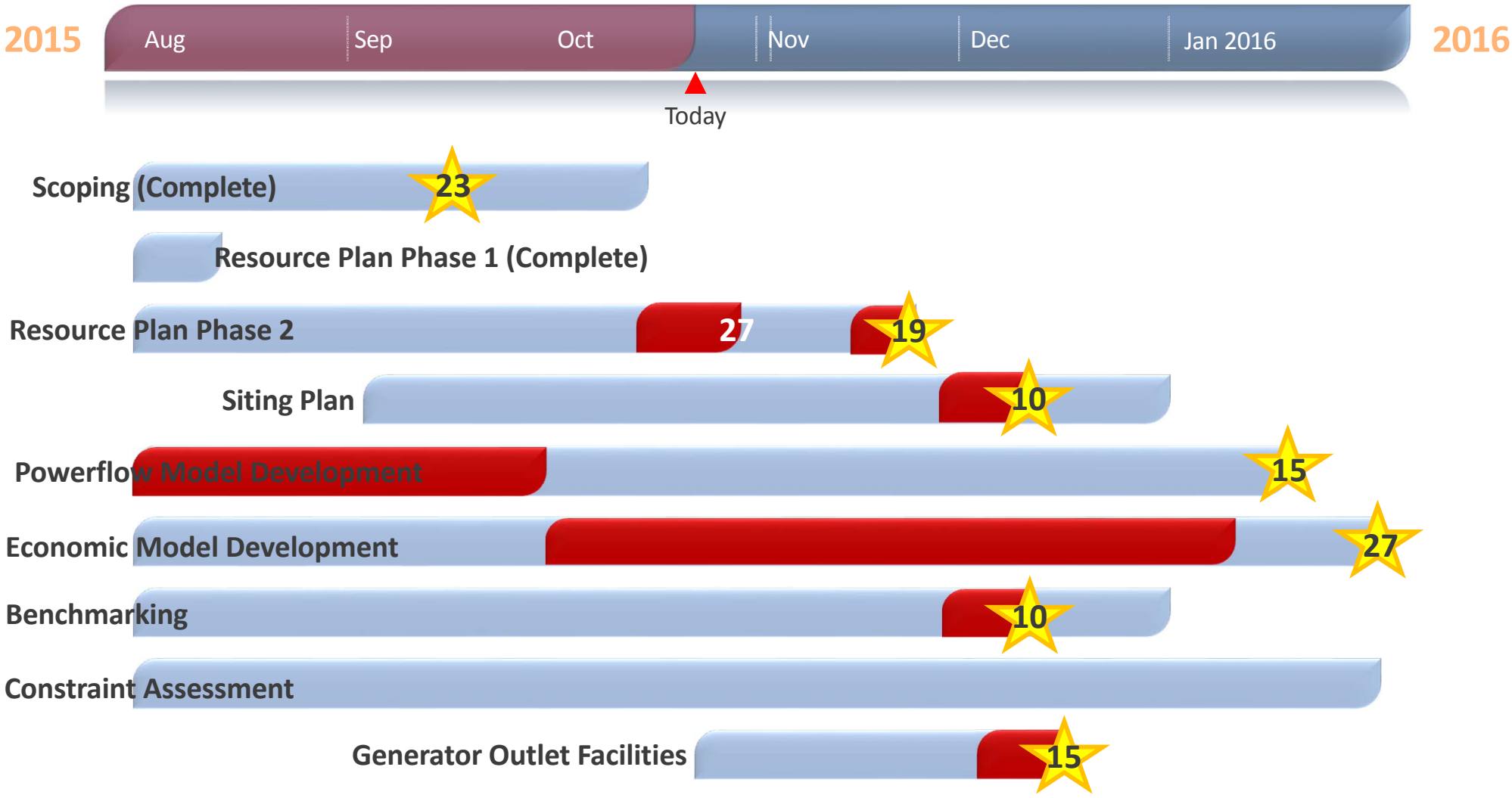
- Other Options
  - Develop resource plan for F2, utilize for F1
    - Utilize different carbon cost adder
    - Saves Staff 120+ hours
    - Reduces tier 1 review
  - Leverage MISO phase 3 CPP study

2017 ITP10 Resource Plan Siting Milestone Update

Chris Jamieson

11/17/2015

SPP Southwest Power Pool



ESWG Approval

Member Review/Feedback Period

Milestone Period

Conventional Siting

- Leverage 2013 ITP20 and 2015 ITP10 sites previously approved by stakeholders and brownfield sites due to projected retirements
- Prescreen 2015 ITP10 and 2013 ITP20 sites for generator outlet capability
- Posted generator outlet capability prescreen and sites by transmission pricing zone on 11/4 and requested stakeholders to provide alternatives and feedback
- Perform additional generator outlet capability prescreening as necessary
- Post draft siting by 11/20 for stakeholder review and feedback

Wind Siting

- Leverage GI Queue and Study Results
- Wind site assignment by pricing zone then by state(s) in which utility operates
- Rank sites by generation queue status then by capacity factor
- Generation queue status priority
  - IA on-schedule
  - IA on-suspension
  - IA commercial operation not fully on-line
  - IA pending
  - Facility Study
- Post draft siting by 11/20 for stakeholder review and feedback

Utility scale solar siting

- **Utilize the NREL Power Data for Integration Studies (2006)**
  - **442 sites and 30 GW of capacity**
  - **Mapped NREL sites to SPP buses within 10 miles (271 sites)**
  - **Removed bus/site pairs (267 sites)**
    - 345 kV less than 200 MW site and 230 kV less than 150 MW
  - **Prescreened SPP buses for generator outlet capability and removed any buses with generation outlet capability less than NREL site capacity**
  - **Also, removed SPP 161 kV – 69 kV buses without load (213 sites)**

Utility scale solar siting

- Rank sites for each Pricing Zone Area by NREL site capacity factor, NREL site maximum capacity, bus kV, and potential.
- Solar site assignment by pricing zone then by state(s) in which utility operates
- Determine the average capacity factor of sites for SPP
- For companies that fall below the average capacity factor portions of their solar will be assigned in a pricing zone area with greater capacity factors
- Post draft siting by 11/20 for stakeholder review and feedback

Rooftop solar siting (Future 3)

- Determined the top 90th percentile load buses in each PROMOD demand group using the ESWG approved load review data, and assigned rooftop solar to these buses on a load-ratio share
- Post draft siting **by 11/20** for stakeholder review and feedback

Slide 7

A5 new slide

Author, 10/30/2015

Annual GHI Map & SPP Sub-Regions for Siting

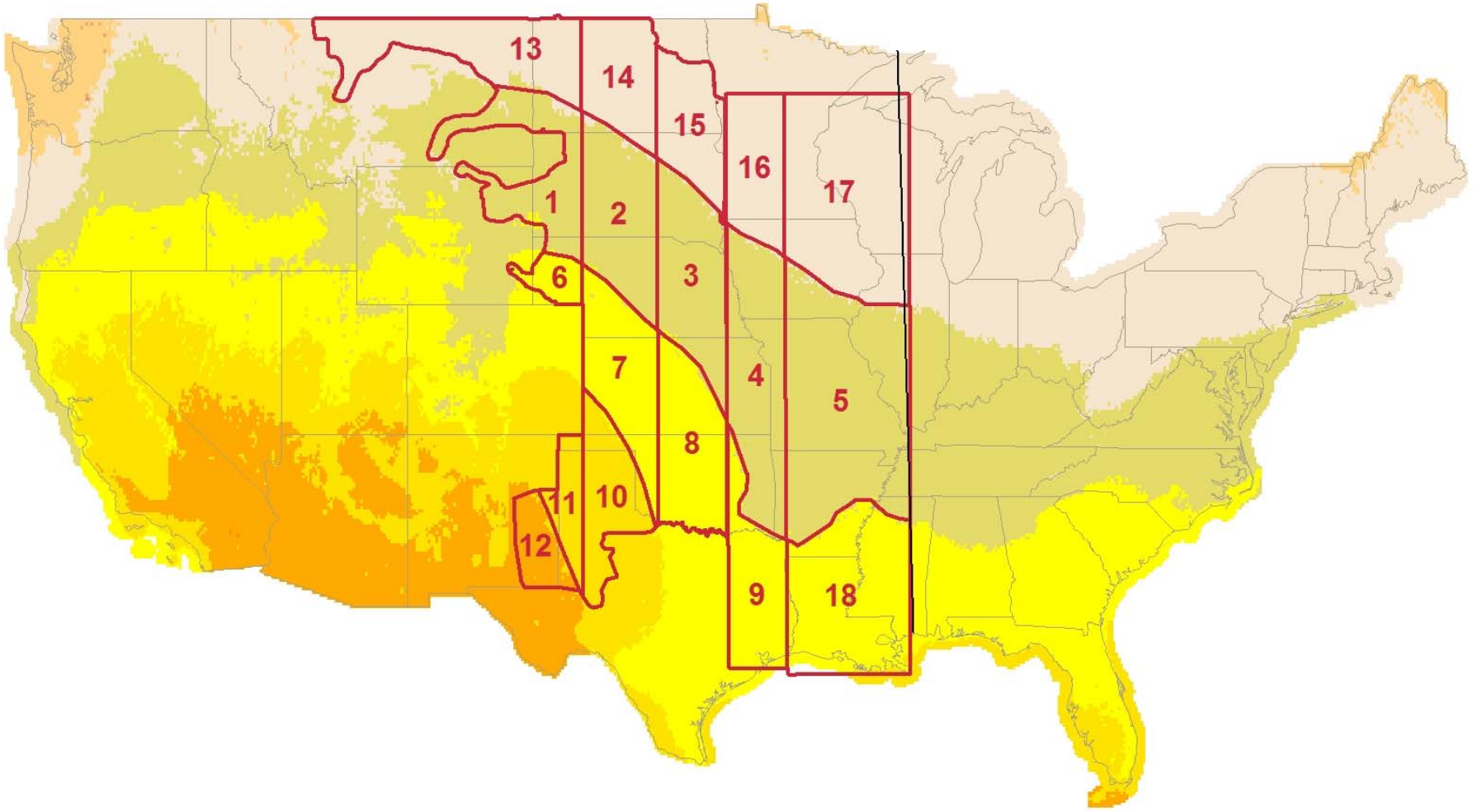
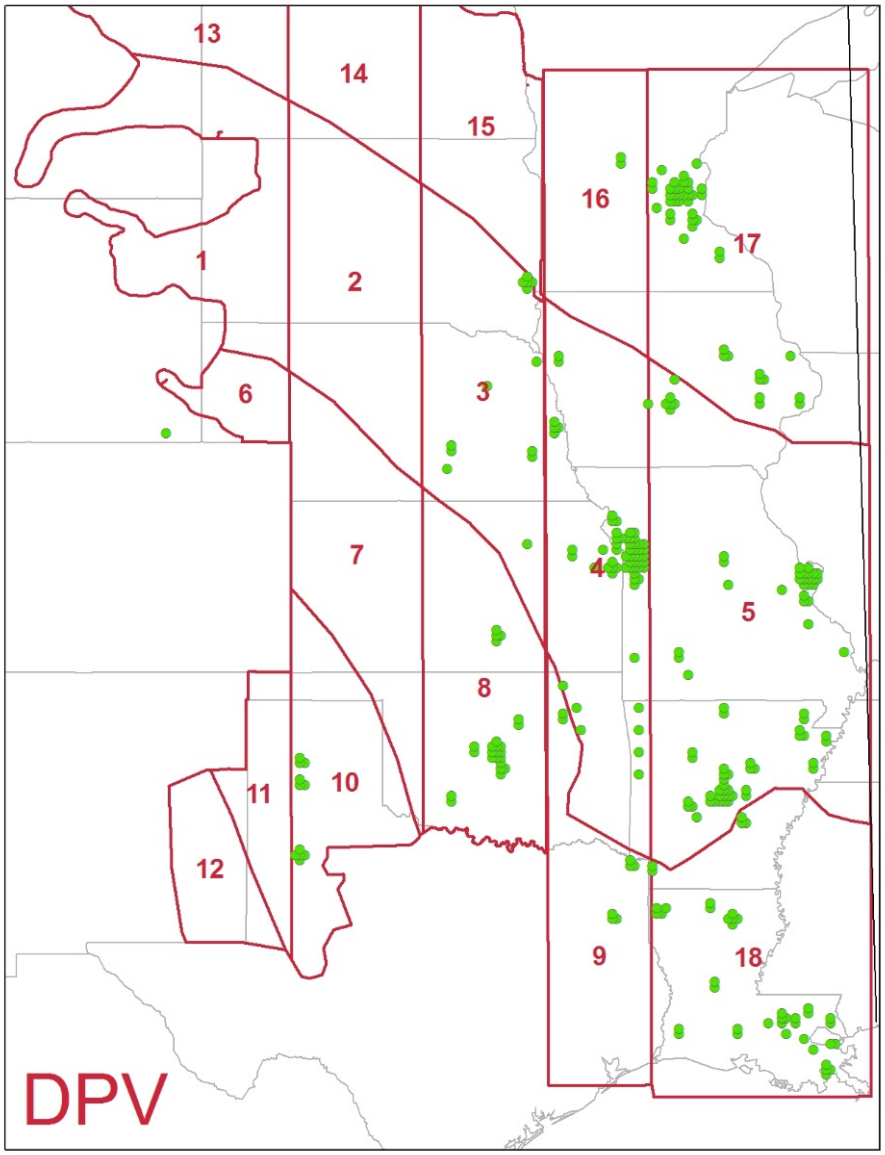
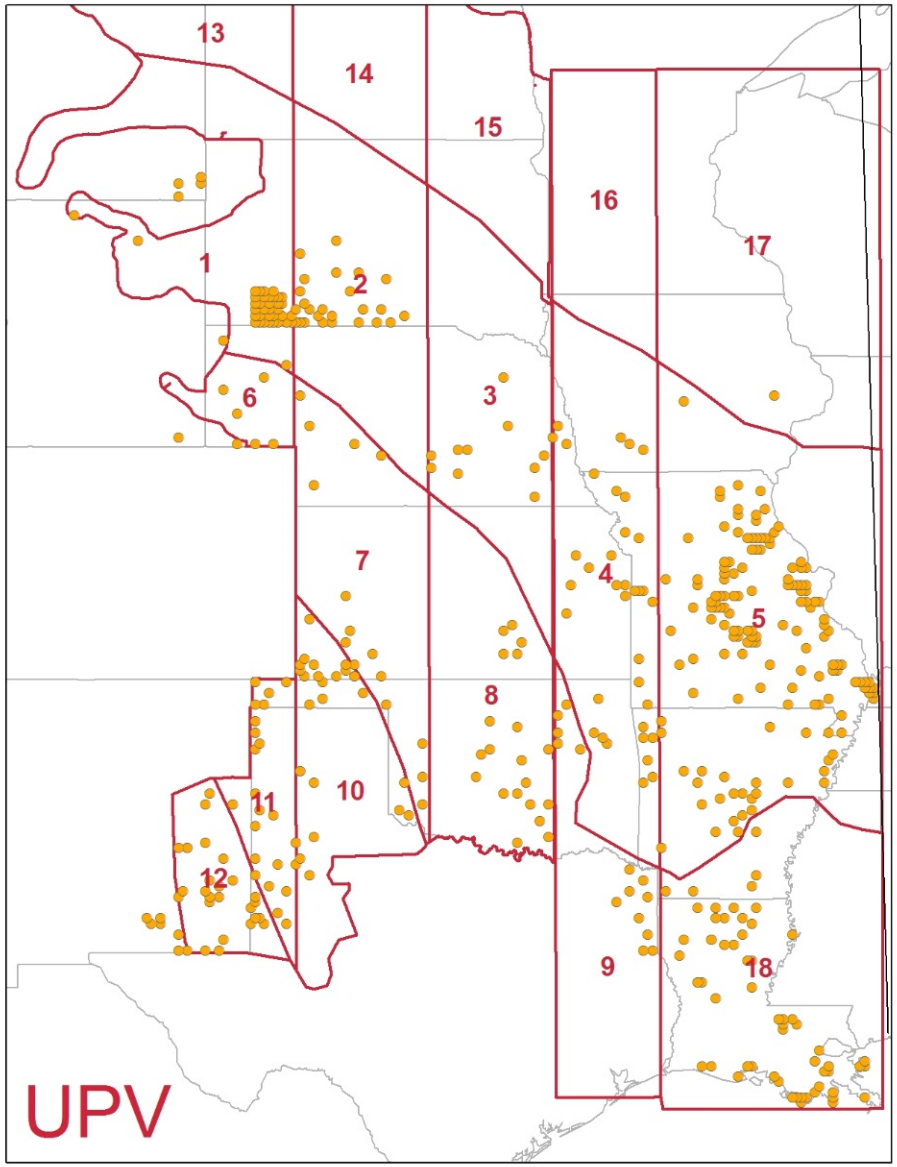


Figure 4.1 | *"NREL Solar Prospector: GHI"*

DPV and UPV Sites for each Sub-Region





2017 ITP10 Study Assumptions

What does the Scope say?

Scope Discussion

Southwest Power Pool

PROJECT SELECTION

What does the Scope say?

Economic Project Solutions

- Economic projects will be developed and evaluated based upon how well they mitigate congestion. Any economic project with a one-year B/C ratio greater than the approved ESWG threshold will be included for further evaluation

Interregional Considerations

- SPP will collaborate with neighboring entities regarding the identified needs, benefits, potential solutions, and costs. For the neighbors that SPP has an agreement with, joint coordination will be done in accordance with that agreement
- Seams projects will be initially evaluated and considered under the assumption that the project would be cost shared with an SPP neighbor

2015 ITP10 Project Selection

- Solicit stakeholders for solutions for all identified needs
- Policy projects: mitigate renewable curtailment to meet the regulatory/statutory mandates and goals
- Economic projects
  - Screening: B/C ≥ 0.75 for one year
  - Final Portfolio: B/C ≥ 0.9 for one year
- Seams projects
  - Identified based on seams needs addressed
  - 80/20 cost sharing

Project Selection Recommendation

- Set an APC based 1-year individual project B/C threshold
  - ≥ 0.75 to pass screening
  - ≥ 0.9 for inclusion in a final portfolio
- Seams projects evaluated for benefit to external zones with a cost sharing split based on benefit share
- Policy Projects must allow the utilities to meet the regulatory/statutory mandates and goals
  - Economic performance criteria used to select top projects

PROJECT GROUPING

2015 ITP10 Project Grouping Methodology

- Reliability, policy, and economic projects will be combined into project groupings for each future and evaluated for redundancies
- Economic project groupings will be developed considering:
  - Project's screening 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

2015 ITP10 Project Grouping

- **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 Grouping Recommendation

- Keep the same methodology as the 2015 ITP10
  - Option to adjust congestion relief threshold
- Adjust groups
  - Remove highest gross APC benefit grouping
  - Cost-Effective Rank - Total Project Cost / Flowgate Congestion Cost Mitigated
  - 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 two groups will be utilized to determine projects

PORTFOLIO CONSOLIDATION

What does the Scope say?

Final Recommended Portfolio

- Reliability, policy, and economic solutions will be grouped together and refined to create a portfolio for each future. The grouping of projects will be evaluated for redundancies. If, for example, a reliability project is similar to a policy project, the two projects will be evaluated to see which project meets both the reliability need and the policy need in the most cost effective way, while the other project is then discarded. The final portfolio for each future will be consolidated into a single portfolio. The consolidation of reliability, policy and economic projects will be based upon criteria approved by the ESWG, TWG, and the MOPC

Consolidation Discussion

- **Criteria 1: Projects in at least 2 of 3 future portfolios are included in the consolidated portfolio**
  - **Possible modification would be if the project in both CPP futures**
  - **Future 1 and Future 2 may be very different answers depending on how they are modeled, resulting in big differences in the portfolios**
- **Criteria 2: Projects in only 1 future portfolio must have a Weighted sum APC B/C ratio above 0.9 and a 1-year B/C greater than 0.7 in a second future**
  - **Possible addition would be to invoke a no negative impact criteria**
    - For example, no negative 1-year B/C or B/C less than 0.5 in remaining future

PROJECT STAGING

What does the Scope say?

Staging

- The final portfolio will be structured such that each element can be implemented in a staged manner as actual system developments approach the assumptions resulting in the need for that element. To help stage the projects SPP will utilize years 2020 and 2025.

Single Project Classification- For economic projects, Staff will stage projects based on linear interpolation of B/C ratios from 2020 to 2025 with consideration of lead times.

- For policy projects, Staff will stage projects in order to meet the renewable requirements.

Multiple Project Classification- If a project is classified as more than solely economic, policy, or reliability project, the project will be staged to meet the earliest need date

Project Staging Criteria – 2015 ITP10

- Single project classification
  - Economic – staged in the year the project reaches 1.0 B/C based on a linear interpolation of B/C ratios from 2019 to 2024
  - Policy – staged to meet renewable requirement
- Multiple project classification
  - Staged to meet the earliest need date established through the Single Project Classification

Project Staging Recommendation

- **Staff recommends utilizing the 2015 ITP10 project staging methodology**

40-YEAR FINANCIAL ANALYSIS

What does the Scope say?

Forty-Year Financial Analysis

- APC savings will be calculated for multiple model years, including 2020 and 2025. The slope between the selected points will be used to extrapolate the benefits beyond 2025. A terminal value will be used for the last 20 years of the benefit calculation. The project costs will be calculated using the formulas for Annual Transmission Revenue Requirement (ATRR)

40-Year Analysis Discussion

- Extrapolation of data over 40-year period historically completed with three data points in an ITP20 and two data points in an ITP10
- Discuss use of three data points in ITP10
  - Technical merits
  - Schedule impacts
- Consideration of in-service dates
- Other considerations

SENSITIVITIES/METRICS/RATE IMPACTS

What does the Scope say?

- A sensitivity analysis will be performed on the recommended portfolio to assess how versatile the plan is in handling a range of uncertainties
- Benefit metrics will be calculated for the recommended portfolio in the appropriate future(s)

- Need to determine model and project sets to use for analysis

2015 ITP10 Methodology

- Sensitivities
  - Perform sensitivities on the final portfolio in future 1 model
- Metrics
  - Calculate benefit metrics on the final portfolio (including non-NTC projects) in both futures models
- Rate Impacts
  - Calculate rate impacts on the final portfolio (including non-NTC projects)

2017 ITP10 Recommendation

- Calculate 8 approved benefit metrics on recommended NTC projects of the final consolidated portfolio in Future 1 and Future 3
- Perform natural gas and demand sensitivities on recommended NTC projects of the final consolidated portfolio in Future 1 and Future 3
- Calculate rate impacts on recommended NTC projects of the final consolidated portfolio

2016 ESWG Meeting Schedule

November 18th, 2015

Kelsey Allen

SPP Southwest Power Pool

Proposed Schedule – 1st Semester

January

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						

February

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					

March

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		

April

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

May

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				

June

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		

Month	Day	Location
January	21	Lubbock
February	17-18	Kansas City
March	17	Dallas
April	21	OKC/Amarillo/Lubbock
May	18-19	Omaha
June	16	Dallas

BOD
RSC
MOPC
PCWG
SPCWG

CAWG
TWG
ESWG
MDWG

SSC
SPC
GWG

SPP Holiday

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

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
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			

September

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	

October

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					

November

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			

December

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

Month	Day	Location
July	21	?
August	17-18	Billings
September	15	Dallas
October	20	?
November	16-17	Little Rock
December	8	Dallas

BOD
RSC
MOPC
PCWG
SPCWG

CAWG
TWG
ESWG
MDWG

SSC
SPC
GWG

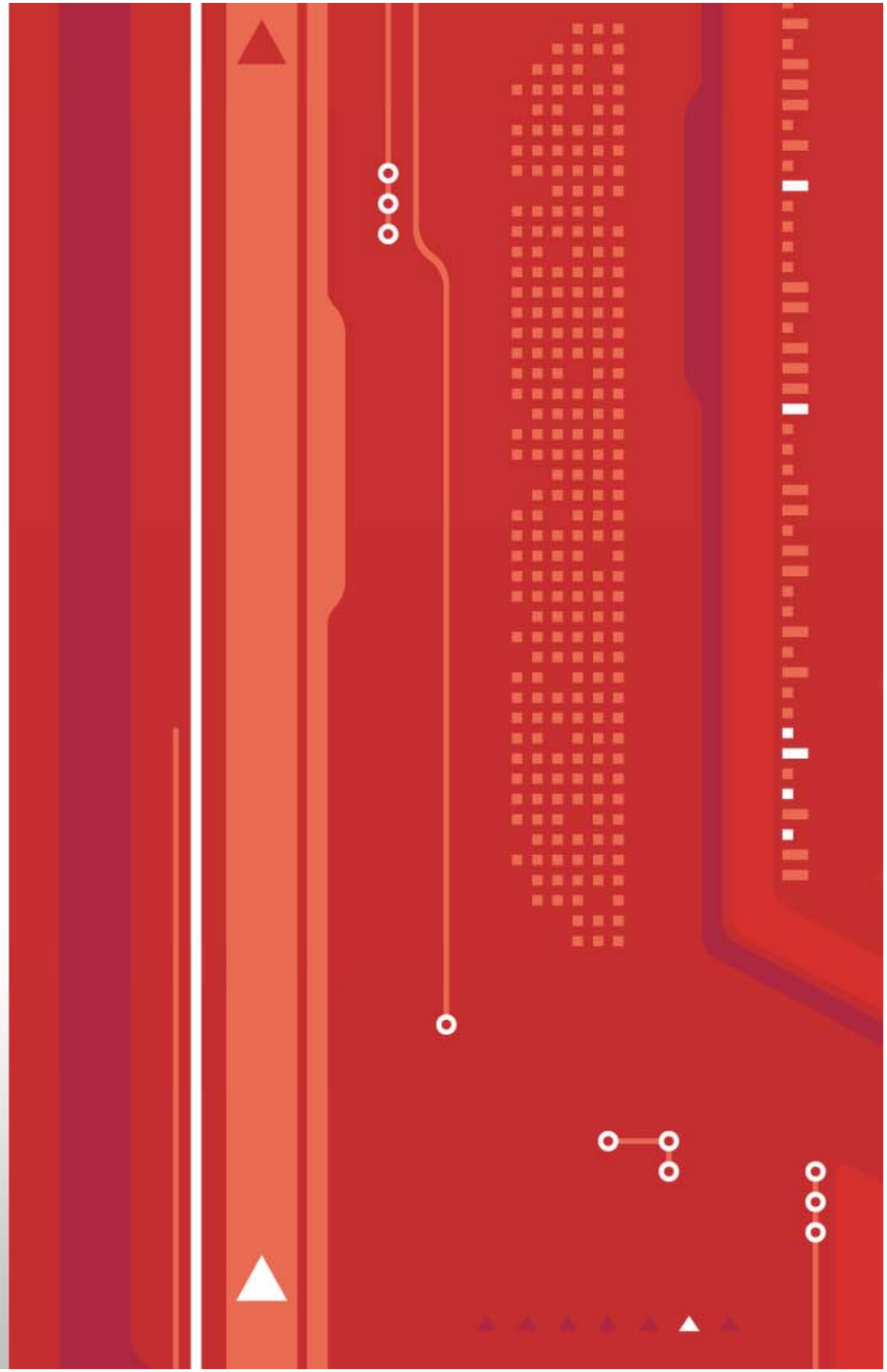
SPP Holiday

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

MOPC Action Item #255

November 18th, 2015

ESWG



Southwest Power Pool

MOPC Action Item #255

- Review the method to determine the Cost of Congestion as it relates to Outages for Rebuilds approved
- Assigned to Staff January, 2015
- Seeking ESWG input

ESWG Discussion 7/9

- There is a cost we're not capturing
  - How do you measure it?
  - How impactful is it in assessing overall benefits?
- Other type of line outage costs we do not capture
  - No stochastic line outages in our models now
  - Transmission lines are taken out many times over their life and we do not capture those costs
- Are these just transactional costs?
  - Not costs associated with long run use of a new (rebuilt) line

Other Considerations

- Typical outage costs could be assessed but would be equivalent for all projects studied
- What should be modeled for duration of the line outage?
- How does the congestion cost factor into an equivalent 1-year cost of a comparative transmission project?
- Potential impacts on reliability project selection

Studying Congestion Impacts

- Proof of concept study
- Leverage operational data to determine typical congestion cost increase due to outage for historical rebuild
  - Use blanket approach
  - Case by case
- Add congestion cost to project E&C cost during project selection phase