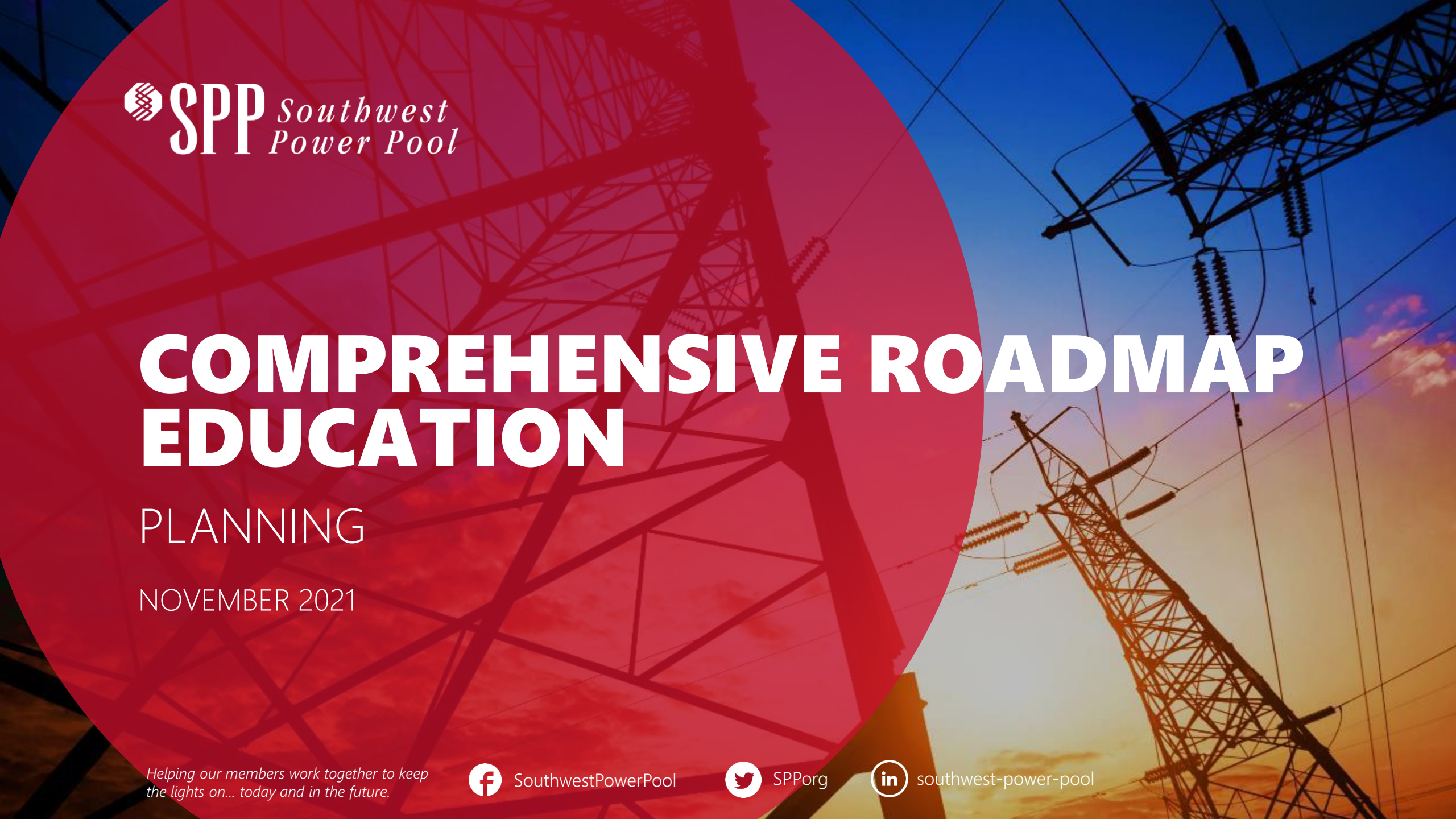


SPP Southwest Power Pool

COMPREHENSIVE ROADMAP EDUCATION

PLANNING

NOVEMBER 2021

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

SouthwestPowerPool SPPorg southwest-power-pool

AGENDA

- Process Education
- Initiative Population Overview
- Initiative Education
- Next Steps

PROCESS EDUCATION

VALUE AND AFFORDABILITY

"SPP must understand its stakeholders' and members diverse' interests and consider competing demands and pressures as necessary and appropriate while ensuring the organization is positioned to create the sustainable, long-term value in which all stakeholders have an interest as a unified body."

- Stakeholders requested:
  - Increased transparency regarding work
  - Increased collaboration through vetting, approval, opportunity for input
  - Increased transparency & consideration of initiative impact on budget
  - Efficiency and improvement in RR process
  - Clarity and improvement in stakeholder prioritization
  - Streamlined stakeholder processes

A proactive living work plan for enhancing SPP's future

What is a Roadmap

Unified path to achieving strategic goals and creating sustainable long-term value

Evaluates initiatives both on their own merit and on how they support SPP's strategy

Facilitates shared vision and informed decision making

Enhances ability to measure value and affordability

Diversified - strategic and tactical

Roadmap Benefits

Increases transparency & collaboration

Balances diverse stakeholder interests

Aligns with SPP's strategic plan, budgets & portfolio management

Ensures focus on greatest area of need

Enhances coordination within SPP and Stakeholders

Flexible

Stakeholders' Role

Annually select, rank & approve initiatives

Provide education on submitted initiatives

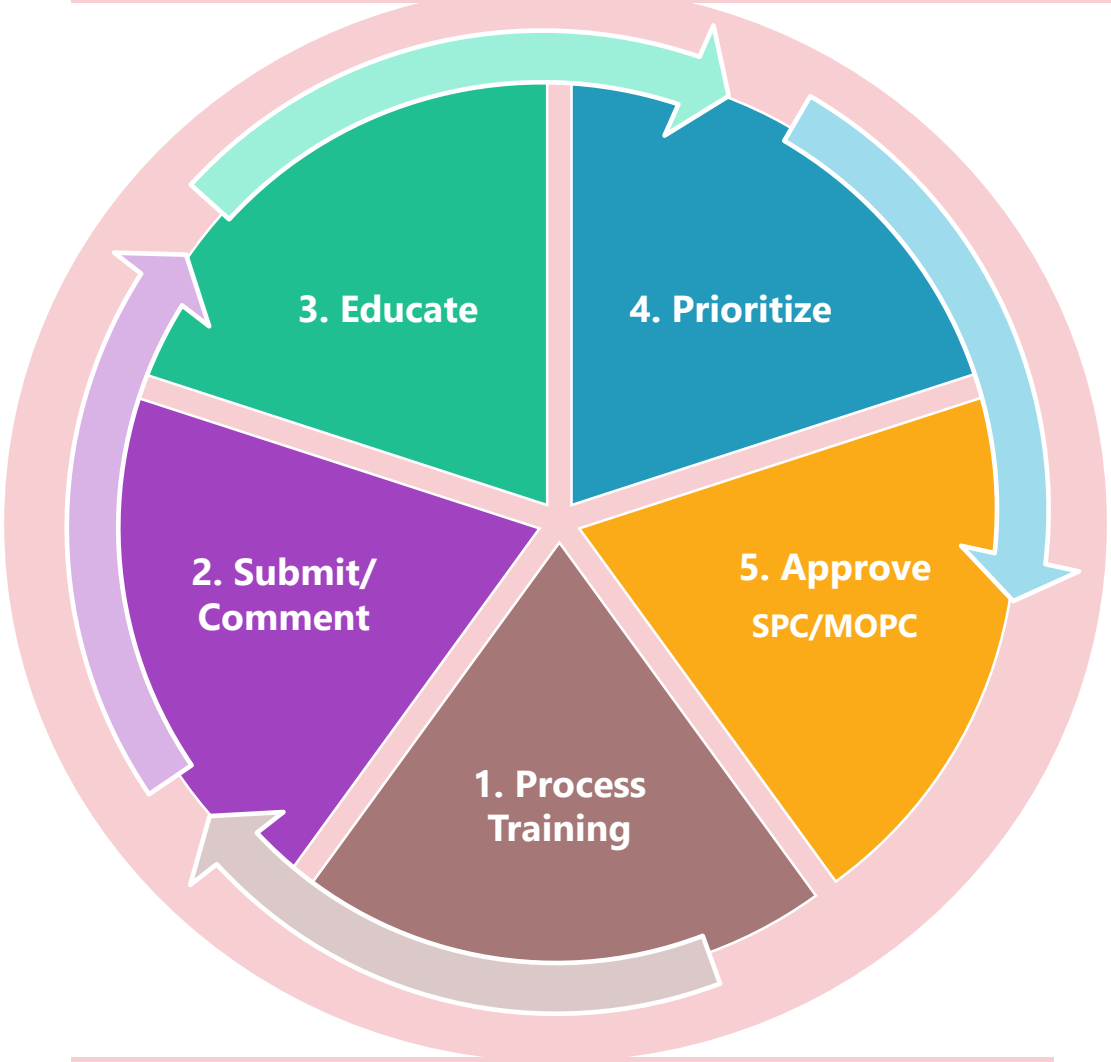
Balance ad-hoc initiatives against approved roadmap initiatives

Monthly review progress & recommend adjustments

Proactively plan at stakeholder organizations

Markets, Operations, Planning, Supply Adequacy, Oversight

SPP Roadmap Development Process



Design Development Process

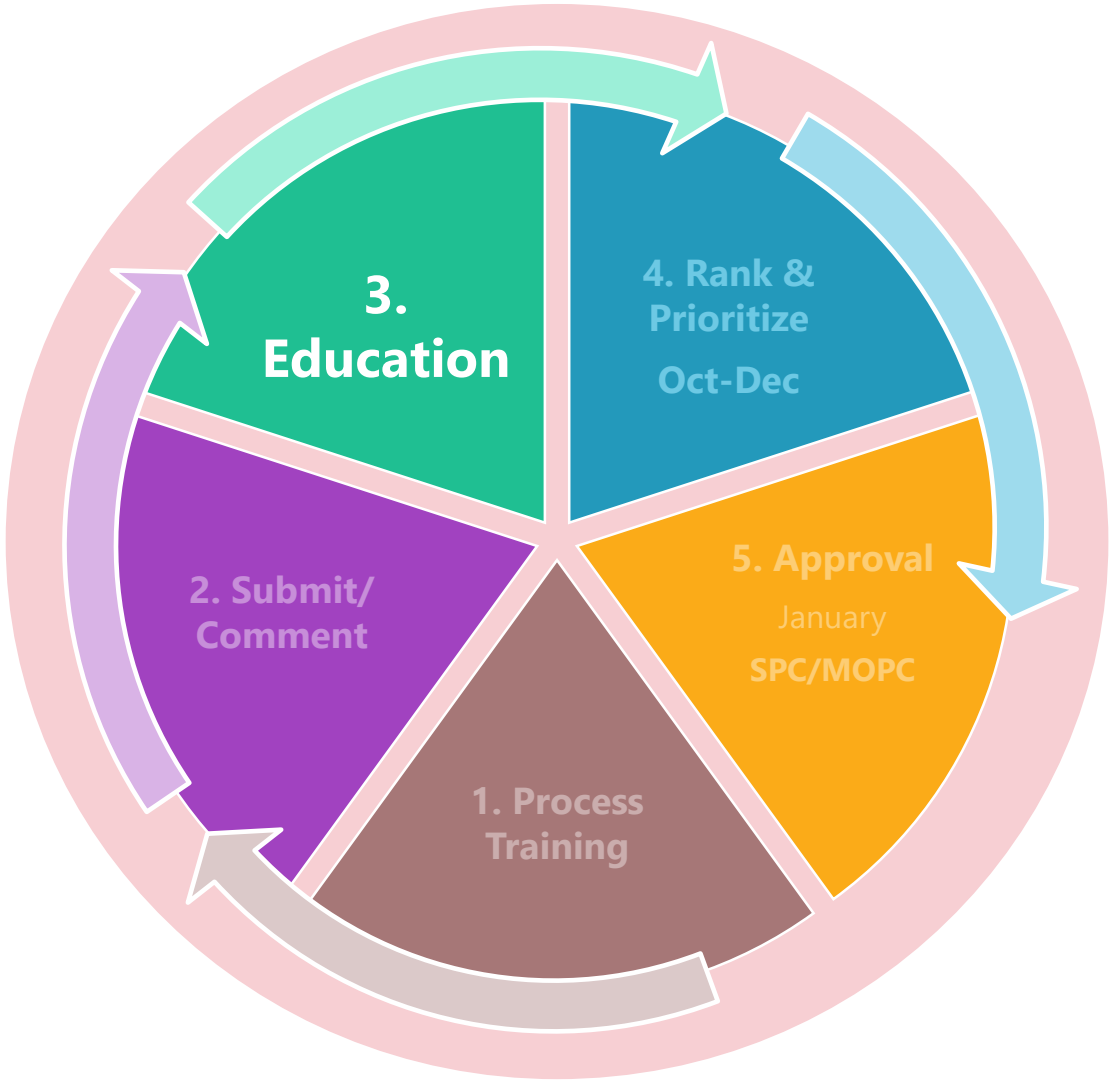
Roadmap Process - Proactive, Ahead of Design Development

Roadmap

Multiple initiatives in design development at any given time

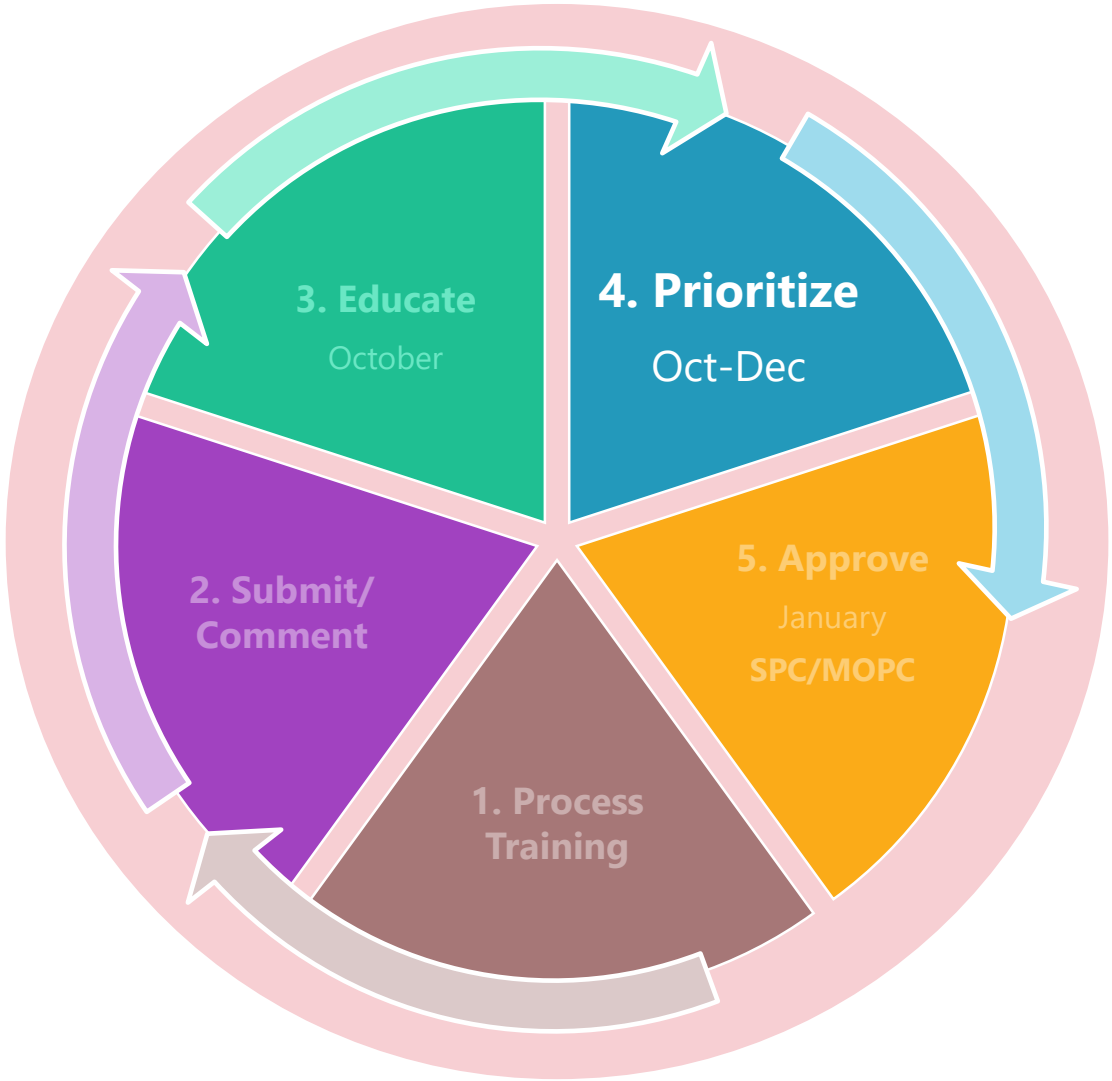
2021 Roadmap Development Remaining Activities

- **Education**
  - Each functional area holds education sessions
  - Purpose & benefit
  - Initial value & impact
  - Fine-tune initiative list
  - Enhances decision making ability during prioritization



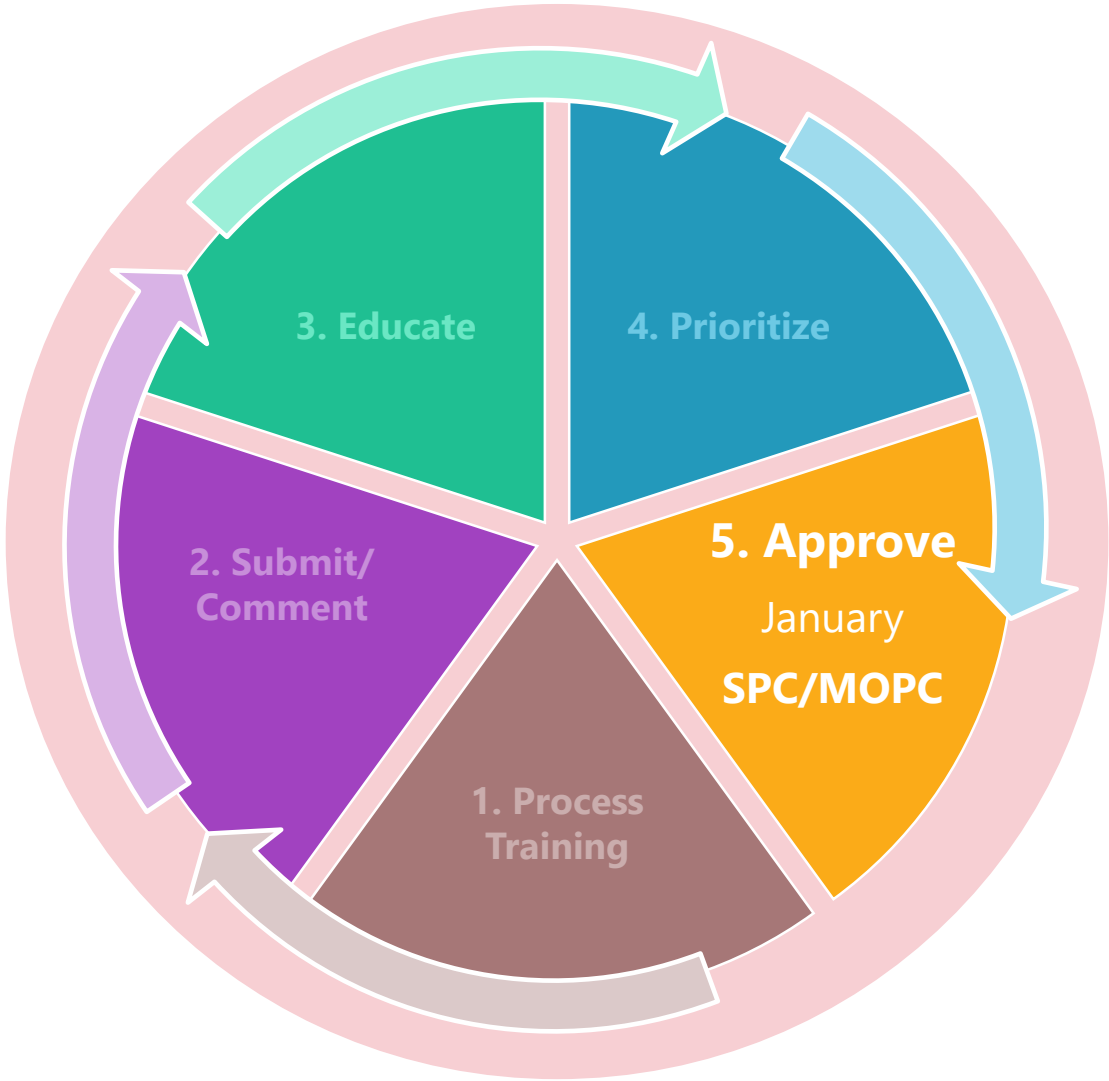
2021 Roadmap Development Remaining Activities

- **Rank & Prioritize**
  - Informed decisions based on education
  - Collective functional area prioritization based on individual responses
  - SPP & MMU informational prioritization



2021 Roadmap Development Remaining Activities

- **Approval**
  - Functional area groups approve prioritization
  - SPP proposes schedule based on priority buckets
  - SPC reviews comprehensive initiative roadmap and analysis
    - Recommendation to MOPC
  - MOPC reviews comprehensive initiative roadmap, analysis and SPC recommendation
    - Approves roadmap



STRATEGIC MARKET ROADMAP RESOURCES

- SPP Roadmap Webpage
- SPP Roadmap Exploder
- Request Management System
- Erin Cathey – ecathey@spp.org

SPP Southwest Power Pool

SPP TRANSMISSION PLANNING ROAD MAP

SPP TRANSMISSION PLANNING ROAD MAP

- All current and planned initiatives related to SPP's Transmission Planning Processes
  - Transmission Working Group (TWG)
  - Economic Studies Working Group (ESWG)
  - Model Development Advisory Group (MDAG)
  - Seams Advisory Group (SAG)
- Resource Adequacy initiatives will be handled in a separate process
  - Supply Adequacy Working Group (SAWG)

CLOSED OR COMPLETED PLANNING INITIATIVES

CLOSED/COMPLETED PLANNING INITIATIVES

Year	SIR	DESCRIPTION
2021	79	Automation Improvement - GlobalScape Server Admin Process
2021	80	Automation Improvement - RMS - RMS Knowledgebase articles
2021	137	Generator replacement process
2021	88	GI Improvement - Improve/optimize the LOIS process
2021	89	GI Improvement - Special Studies - Develop more robust processes
2021	94	Automation Improvement-Complete WECC DB transition
2021	96	Model Reduction

CLOSED/COMPLETED PLANNING INITIATIVES

Year	SIR	DESCRIPTION
2021	99	Automation Improvement - EDST improvements, enhancements, coordination and testing
2021	105	Frequency Response Studies
2021	107	Reliability Assurance Improvement - Develop process for FAC-002-2 Transmission Interconnection stability
2021	109	Reliability Assurance Improvement-TPL-001-5 outage coordination
2021	133	Transmission Service Improvements-Attachment AR DPT revisions
2021	225	WWE RPA2.5. Evaluate the transmission planning, transmission service to reflect system conditions experienced in real time. SPP should consider various probable dispatch patterns and transmission system conditions including N-1-1

PLANNING INITIATIVE POPULATION OVERVIEW

MANDATED INITIATIVES

MANDATED PLANNING INITIATIVES

- Process Notes
  - Mandated initiatives are the highest priority
  - FERC/NERC directed initiative and timeline
  - Not prioritized by stakeholders

Year	SIR	Recommendation	Start	Est. End
2020	98	Software Upgrade-Automation Improvements-PSSE v34 to v35	2021	Q2 2023
2020	117	2022 20-Year Assessment	2020	Q2 2023

DIRECTED INITIATIVES

DIRECTED PLANNING INITIATIVES

- Process Notes
  - Directed initiatives are the second highest priority
  - BOD directed initiative and timeline
  - Not prioritized by stakeholders beyond the BOD

Year	SIR	Recommendation	Start	Est. End
2021	90	HITT T4. Evaluate 3-phase GI process	2020	Jan 2022
2021	93	HITT T1. Implement modifications to NRIS and ERIS	2021	Q1 2024
2021	93.1	HITT T1. CRIS Phase 1 - Studies	Q1 2022	Q4 2022
2021	93.2	HITT T1. CRIS Phase 2 – Implementation	Q4 2022	Q1 2024
2021	93.3	HITT T1. ERIS Threshold	Q2 2022	Q3 2022
2021	121	HITT T2. Establish uniform Schedule 9 local planning criteria for each zone (RR477)		January 2022
2021	130	HITT T3. Implement new load addition modifications. Phase II	Q1 2022	Q4 2022
2021	136	GI Backlog Mitigation - Implementation (RR458)	Nov 2021	

HIGH PRIORITY INITIATIVES

HIGH PRIORITY PLANNING INITIATIVES

- Process Notes
  - High priority initiatives are in progress and previously set as “high” priority by stakeholders through ongoing work

Year	SIR	Recommendation	Start	Est. End
2021	78	Value of Transmission Study	2021	Q4 2022
2021	83	Automation Improvement - Evolve SmartQ to include GI special studies	2021	Q2 2022
2021	86	GI Improvement – Clean-up and clarify Attachment V	2021	Q2 2022
2021	95	Model Validation Improvements	2020	Q2 2022
2021	129	2022 Regional Cost Allocation Review (RCAR) III	2021	Q4 2022

HIGH PRIORITY PLANNING INITIATIVES – CONT.

- Process Notes
  - High priority initiatives are already in progress or grouped with active high priority initiatives

Year	SIR	Recommendation	Start	Est. End
2021	134	Transmission Service Improvements-Policy change for over-subscription of units	2021	Q3 2022
2021	135	Transmission Service Improvements-Sponsored Upgrade categorization clarifications	2021	Q3 2022
2021	139	SCRIPT S1. GI backlog mitigation (RR458)	2021	
2021	187	ESR Tx1-Tx9-Storage as Transmission Only Asset (SATOA) (RR476)	2020	
2021	188	ESR E1-Develop ESR Transmission Planning Study Process	2020	

TBD PRIORITY INITIATIVES

TBD 2021 PLANNING INITIATIVES

- Process Notes
  - TBD initiatives will be prioritized with this roadmap cycle

SIR	Recommendation
81	Automation Improvement – SPP.org maintenance page navigation updates
85	GI Improvement - Improve/optimize affected system studies process
91	GI Improvement - Model Management Service Process
100	Model Improvement - Node Breaker Build-out and testing
102	ITP Improvements - Load Shape modification
115	Software Upgrade - Automation Improvements - PROMOD

TBD 2021 PLANNING INITIATIVES – CONT.

SIR	Recommendation
118	ITP Improvement - Standardized Impedance Values
0119	ITP Improvements - Conceptual Cost Estimate Improvements
0122	Targeted Market Efficiency Projects with MISO
0126	ITP Improvements - Interchange Methodology (ESWG Action Item 201)
0127	ITP Improvements - MISO Entergy LA-TX Unit Commitments (Constraint Assessment)
0132	Automation Improvement - Transmission Service - Cost Allocation Database Rewrite

TBD 2021 PLANNING INITIATIVES – CONT.

SIR	Recommendation
140	SCRIPT C1. Implement a consolidated planning process *Recommendation: SPP staff and stakeholder groups should develop implementation-level processes for a consolidated planning assessment that represents a balance between assessment timeliness, customer optionality, cost-certainty of assigned upgrades and regulatory compliance.*
140.1	SCRIPT C1.1. Consolidated implementation: Phase 1 *Recommendation: SPP staff and stakeholder groups should implement an initial "Phase 1" consolidated planning process that can meet the needs of SPP's Integrated Transmission Planning (ITP), NERC Transmission Planning TPL-001, Transmission Service (TS), Generator Interconnection (GI) and local planned transmission systems changes activities.*
140.2	SCRIPT C.1.2. Consolidation implementation: Phase 2 *Recommendation: After implementing C1.1 and completing an initial consolidated planning assessment, SPP staff and stakeholder groups should develop and implement policies to bring SPP's system load (AQ), sponsored upgrades, and generator retirement processes into the consolidated planning assessment process.*
141	SCRIPT C2. Engineering data collection, review and correlation *Recommendation: SPP should develop data collection, review, and correlation improvements including the build out of the data collection and review databases and Engineering Engine to increase data correlation for various planning model builds and processes.*
141.1	SCRIPT C2.1. Model data collection and review
141.2	SCRIPT C2.2. Engineering Engine
142	SCRIPT C3. Common base model set *Recommendation: SPP should annually develop one common set of models to meet all regional transmission planning needs. Model development and benchmarking should be consolidated to meet those needs as required by SPP's tariff and NERC reliability standards with minimum unique model inputs between requirements.*

TBD 2021 PLANNING INITIATIVES – CONT.

SIR	Recommendation
143	SCRIPT S2. Service process improvements for consolidation *Recommendation: SPP staff should work with the appropriate functional working groups to identify and implement process improvement solutions that facilitate timely and efficient service for GI request, long-term transmission service (TS) request, and delivery point addition (AQ) request processes under a consolidated planning process.*
143.1	SCRIPT S2.1. Pre-screening tools and requirements
143.2	SCRIPT S2.2. GI readiness criteria
143.3	SCRIPT S2.3. GI decision point criteria
143.4	SCRIPT S2.4. NEDTF deliverability areas recommendations
143.5	SCRIPT S2.5. Long-term Transmission Service requests
143.6	SCRIPT S2.6 Attachment AQ requests
143.7	SCRIPT S2.7 Provisional services

TBD 2021 PLANNING INITIATIVES – CONT.

SIR	Recommendation
144	SCRIPT O1. Holistic needs and solutions assessments *Recommendation: SPP should develop a process to conduct holistic planning needs and solutions assessments under the consolidated planning process.*
145	SCRIPT CS1. Upgrades that meet multiple needs *Recommendation: For projects approved for construction under a consolidated planning process, SPP should apply the highway-byway methodology to the portion of cost that receives Base Plan funding. If an approved project provides transmission and/or generator interconnection service, the cost may be fully or partially assigned to the customer(s) under methodologies adapted to a consolidated planning framework.*
146	SCRIPT CS2. Upgrades that require joint funding *Recommendation: SPP should establish mechanisms to fund an upgrade jointly through rates and direct assignment charges when neither the ITP benefit-cost assessment nor direct assignment alone is sufficient to fund the project.*
147	SCRIPT DQ1. Consolidated process and schedule *Recommendation: SPP should develop the necessary processes to ensure a Decision Quality Framework is built into the study process and schedule of a consolidated planning process.*
148	SCRIPT C4. High priority study planning assessment Modify the high priority study planning assessment requirements to provide additional scope flexibility and be performed on an "as needed" basis.
149	SCRIPT S3. Administrative and technical procedures Identify and implement improvements to administrative and technical study procedures, including models, scenarios and assumptions.

TBD 2021 PLANNING INITIATIVES – CONT.

SIR	Recommendation
150	SCRIPT S4. Number of TS products Eliminate the long-term service request and delivery point transfer processes under Attachment AR.
151	SCRIPT O2. Project value drivers Develop and prioritize a set of standard value drivers for the consolidated process and use this information to analyze and compare projects.
152	SCRIPT O3. Aging infrastructure Develop policies to add aging infrastructure to the ITP as a formal need to be considered and addressed under the consolidated planning process.
153	SCRIPT O4. ATC calculation and use Develop a process to implement proactive ATC calculations for delivery points, and include aggregate TS and GI studies.
154	SCRIPT O5. Non-transmission expansion solutions Develop policies that appropriately expand the definition of "transmission" and modify planning processes to allow use of non-transmission solutions.
155	SCRIPT O6. SPP and MISO Better align the timing of SPP's and MISO's planning and GI processes.

TBD 2021 PLANNING INITIATIVES – CONT.

SIR	Recommendation
156	SCRIPT DQ2. Modeling data Assess ways to centralize and improve timeliness and accuracy of model building and assumptions through new restrictions, tools and processes.
157	SCRIPT DQ3. Cost estimation process Conduct a review of ways to improve the quality of the cost estimation process.
158	SCRIPT DQ4. ITP futures Identify the most impactful variables in the futures development process and prioritize a data driven approach to determining those input.
159	SCRIPT DQ5. Solution development and submissions Ensure planning processes are considering multiple high-quality alternatives to address transmission needs across all of SPP's planning processes.
160	SCRIPT DQ6. Sensitivity Analysis and Benefit Metrics Assess and implement changes to when and how sensitivities and benefit metrics are set and used.
161	SCRIPT DQ7. Presentation of Study Results Improve transparency, coordination and decision making at the end of the planning process.
162	SCRIPT DQ8: Objective Analysis Implement more objective analysis for decisions that benefit the SPP region, reducing individual bias.

TBD 2021 PLANNING INITIATIVES – CONT.

SIR	Recommendation
163	SCRIPT T1. Benefit metrics and cost allocation SPP should evaluate enhancements to benefit metrics and cost allocation for projects that increase interregional transfer capability.
165	SCRIPT T3. Persistent operational issues Improve practices related to persistent operational issues in regional and interregional planning.
166	SCRIPT T4. Differences in regional reliability planning Identify differences in planning processes across regions, report to MOPC and receive direction.
168	SCRIPT T6. Hurdle rates Assess benefits of projects under consideration without hurdle rates
171	SCRIPT CS3. Repair and replacement Clarify cost allocation and rate treatment for the repair and/or replacement of transmission facilities resulting from the new O3 planning process.
172	SCRIPT CS4. Balanced Portfolio Develop a simplified methodology for the Balanced Portfolio cost allocation for future upgrades, or eliminate it if the methodology is not simplified.
173	SCRIPT CS5. Load ratio share Evaluate the use of prior year annual energy in combination with average coincident peak demand to determine composite load ratio shares for calculating network transmission service charges for upgrades.

TBD 2021 PLANNING INITIATIVES – CONT.

SIR	Recommendation
296	WWE TXP1. Develop policies that facilitate transmission expansion needed to improve SPP's ability to more effectively utilize the transmission system during severe events
297	WWE TXP1.1. Continue focus on improving seams/interregional transmission planning processes and coordination
298	WWE TXP1.2. Develop process changes within the ITP that allow for rotating analysis of potential operational events
299	WWE TXP1.3 Continue to focus on planning projects that allow for more efficient use of the transmission system, looking for opportunities to increase import and export capability into the SPP system when possible
300	WWE TXP2. Develop transmission planning policies that improve input data, assumptions, or analysis techniques to better account for severe events
301	WWE TXP2.1. Utilize the 2021 winter weather event for use in the next NERC MOD-033 power flow validation
322	WWE MMU SD2. SPP and MISO should include the benefits of enhanced transmission capabilities in addressing systems emergencies like the February 2021 winter weather event in their joint transmission planning process.

PLANNING INITIATIVES EDUCATION SESSION

EDUCATION SESSION AGENDA

- Education Items
  - Active initiatives w/changes
  - New 2021 initiatives
- Other Items
  - ESR, HITT, SCRIPT, WWE

EDUCATION ITEMS

SIR81 AUTOMATION IMPROVEMENT - SPP.ORG MAINTENANCE PAGE NAVIGATION UPDATES

SPP

SIR81 AUTOMATION IMPROVEMENT - SPP.ORG MAINTENANCE PAGE NAVIGATION UPDATES SPP

- Purpose
  - Automation Improvement - SPP.org maintenance page navigation updates required based on engineering organizational changes
    - Examples
      - Economic Planning and Reliability Planning = Transmission Planning
      - Compliance and Advanced Studies, Economic Planning and Reliability Planning combined are now Transmission Planning
      - CAS=Reliability Assurance-Resource Adequacy/Planning Coordinator Assessments, etc.
- Potential Benefit(s)
  - Reorganize engineering section of SPP.org for ease of navigation, organization and stakeholder satisfaction
  - Ease of navigation
- Alignment with existing SIR
  - None

SIR81 AUTOMATION IMPROVEMENT - SPP.ORG MAINTENANCE PAGE NAVIGATION UPDATES – CONT. SPP

- Potential Impact(s)
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: Medium
    - No major system or process impacts identified
  - Potential Complexity:
    - Design: Medium
    - Implementation: Medium
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
  - None

SIR85 GI IMPROVEMENT - IMPROVE/OPTIMIZE AFFECTED SYSTEM STUDIES PROCESS

SPP

SIR85 GI IMPROVEMENT - IMPROVE/OPTIMIZE AFFECTED SYSTEM STUDIES PROCESS
SPP

- Purpose
  - GI Improvement - Improve/optimize the affected system studies (AFS) process through changes to relative Affected System queue priority, study methodology, and utilization of industry-standard automation.
- Potential Benefit(s)
  - Timely deliverability of Affected System Studies definitive study results
  - Improved coordination between SPP and all Affected System parties
  - Improved coordination between SPP GI study processes
  - Improved/streamlined study processes
  - Study methodology improvements
- Alignment with existing SIR
  - SIR86 - GI Improvement - Clean-up and clarify Attachment V

SIR85 GI IMPROVEMENT - IMPROVE/OPTIMIZE AFFECTED SYSTEM STUDIES PROCESS – CONT.
SPP

- Potential Impact(s)
  - Queue priority changes may change the way in which SPP studies certain Interconnection Requests as definitive or preliminary
  - Methodology and automation improvements will need to be implemented across all SPP GI studies as applicable
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: Medium
    - No major system or process impacts identified
  - Potential Complexity:
    - Design: High
    - Implementation: Medium
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
  - Stakeholder equity concerns in SPP GI study processes
  - Potential FERC complaints due to continued delayed SPP AFS definitive study results

SIR91 GI IMPROVEMENT - MODEL MANAGEMENT SERVICE PROCESS

SPP

SIR91 GI IMPROVEMENT - MODEL MANAGEMENT SERVICE PROCESS
SPP

- Purpose
  - Improve the model management process through changes relative to requesting models, location of models, and communication to stakeholders
- Potential Benefit(s)
  - Provide transparency to the Generation Interconnection model building process
  - Reduce modeling errors
  - Increase modeling accuracy
  - Leverage existing or new databases based on efficiency
- Alignment with existing SIR
  - No

SIR91 GI IMPROVEMENT - MODEL MANAGEMENT SERVICE PROCESS – CONT.
SPP

- Potential Impact(s)
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: *Medium*
    - Potential System / Process Impacts
      - It can reduce the amount of errors handling generation data, reducing the risk of re-studies or delays to address data error
      - It will impact the efficiency and time required to approve and verify data
  - Potential Complexity: High, Medium, Low
    - Design: Medium
    - Implementation: Medium
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
  - Create a tool robust enough to manage high amount of data

SIR100 MODEL IMPROVEMENT - NODE BREAKER BUILD-OUT AND TESTING

SPP

SIR100 MODEL IMPROVEMENT - NODE BREAKER BUILD-OUT AND TESTING
SPP

- Purpose
  - Model Improvement – Building out node breaker modeling information in future planning models to better understand and asses advanced contingency or fault analysis based on interruptible equipment operations. The initiative should also provide a path for meeting future potential NERC requirements for modeling data
- Potential Benefit(s)
  - Ability to create interruptible equipment operations as part of planning assessment and improve the configuration representation in planning models to better align with operational models
- Alignment with existing SIR
  - None

SIR100 MODEL IMPROVEMENT - NODE BREAKER BUILD-OUT AND TESTING – CONT.
SPP

- Potential Impact(s)
  - Improve the ability to simulate advance contingencies, reduce contingency information from stakeholders, and provide additional details to planning models.
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: Low
    - Impact to annual data request for advance contingency definitions, Low (as this is voluntarily effort and isn't a NERC requirement)
  - Potential Complexity:
    - Design: Medium
    - Implementation: Low
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
  - Potential of becoming a large data collection

SIR102 ITP IMPROVEMENTS LOAD SHAPEM MODIFICATION

SPP

SIR102 ITP IMPROVEMENTS- LOAD SHAPE SENSITIVITIES

- Purpose
  - ITP Improvement – Run various sensitivities of modified load shapes and report on changes in production cost simulation results to inform next step efforts
- Potential Benefit(s)
  - Ensure hourly load shapes are modeled accurately within the Market Models
- Alignment with existing SIR
  - None

SIR102 ITP IMPROVEMENTS-LOAD SHAPE SENSITIVITIES

- Potential Impact(s)
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: *Medium*
    - No major system impacts
    - Process impacts could be sizable depending on modifications required
  - Potential Complexity: High, Medium, Low
    - Design: Medium
    - Implementation: Medium/High
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
    - If modifications to load shapes are implemented, there's a risk for inconsistency across SPP zones
    - Modifications to 8760 data has potential to be tedious

SIR115 SOFTWARE UPGRADE-AUTOMATION IMPROVEMENTS-PROMOD

SPP

SIR115 SOFTWARE UPGRADE-AUTOMATION IMPROVEMENTS-PROMOD SPP

- Purpose
  - The Economic Studies Working Group (ESWG) have action item 201 for SPP staff and ESWG members to evaluate whether to replace or upgrade its existing economic software application
    - ESWG approved an upgrade from PROMOD IV at an appropriate pace in December 2019, keeping PROMOD IV through at least the next two Integrated Transmission Planning (ITP) study cycles
      - The old and new versions of the software will run in parallel for a period prior to full implementation. Benchmarking and status updates on the PROMOD upgrade will be communicated with ESWG.
  - Implementation of the PROMOD upgrade will include procurement, benchmarking the new and old software, installation, integrations, substantial automation updates required for compatibility and process improvements, testing, and process documentation
    - The automation updates tied to this upgrade are critical to successful implementation
  - PROMOD X Cloud computing is being considered as an alternative to the server-based PROMOD HD
  - ESWG approved a gradual implementation of the new PROMOD version. In addition, during this time, SPP Staff and Members will work with MISO and PJM to evaluate what ABB needs to improve in order to maximize the software's functionality for long-term planning
  - Automation, integrated systems, hardware and associated process documents will need to be evaluated, updated and implemented for use with the newer software version

SOFTWARE UPGRADE-AUTOMATION IMPROVEMENTS-PROMOD – CONT.
SPP

- Potential Benefit(s)
  - This software upgrade will provide improved performance with the enhancements made to the software, improve member value and affordability. Staff will have a better toolset to help maintain an economical and optimized transmission system. This upgrade to the PROMOD application is also tied to two recommendations from the Holistic Integrated Tariff Team (HITT). They are S1 to add technological advances and S2 to include seams, both in support of SPP's strategic plan.
  - Moving forward, ABB's PROMOD X software-as-a-service offering will eliminate the need for substantial on-site hardware and support of such hardware while providing significant performance enhancements. PROMOD simulations will utilize Amazon Web Services compute resources underlying the PROMOD X platform to perform simulations in as little as an hour or a day, depending upon AWS computation costs. Storage of results will also reside within the AWS cloud under various pricing tiers depending upon availability needs. Storage of results in the AWS cloud also has the significant benefit of availability of tools that provide for major data analysis enhancements.
- Alignment with existing SIR
  - SCRIPT Consolidation

SOFTWARE UPGRADE-AUTOMATION IMPROVEMENTS-PROMOD – CONT.
SPP

- Potential Impact(s)
  - Limitations to modeling new storage and battery facilities currently exist and a need for an enhanced ability for staff to perform these additional assessments is required. While staff is currently able to perform the current studies with the current version of PROMOD, it will be imperative to implement the PROMOD software upgrade to enable staff to be able to better perform the needed analysis by having access to the enhancements and added functionality available in the newer version
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: High
    - Potential to impact an ongoing ITP
  - Potential Complexity:
    - Design: High
    - Implementation: High
  - Potential Compliance Impacts
    - Potential to impact the schedule of an ongoing ITP
- Potential Risk(s)
  - Delays in the release date for PROMOD X in addition to resource constraints can be considered as risks
  - In addition, the timing of any FERC-related decisions related to modeling new storage and battery facilities would impact the timeline need for this PROMOD software upgrade

SIR118 ITP IMPROVEMENT-STANDARDIZED IMPEDANCE VALUES

SPP

SIR118 ITP IMPROVEMENT-STANDARDIZED IMPEDANCE VALUES
SPP

- Purpose
  - ITP Improvement - Standard impedance values have not been updated in a while and consensus needs to be established and a policy decision made to have updated standardized impedance values documented
- Potential Benefit(s)
  - This work will increase solution creation/evaluation accuracy and provide an additional screening mechanism to quickly promote/reject any project whose impedance values lie within/outside some agreed upon range
- Alignment with existing SIR
  - Potential alignment with SIR119 (Conceptual Costs)

SIR118 ITP IMPROVEMENT-STANDARDIZED IMPEDANCE VALUES – CONT.
SPP

- Potential Impact(s)
  - Potential reduction in staff time spent during Solution Validation for reasons listed above
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: Medium
    - Will need to be formally maintained/updated (additional costs)
  - Potential Complexity:
    - Design: Medium
    - Implementation: Medium-Low
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
  - A project could be awarded points based on invalid impedance values

SIR119 ITP IMPROVEMENTS- CONCEPTUAL COST ESTIMATE IMPROVEMENTS

SPP

SIR119 ITP IMPROVEMENTS-CONCEPTUAL COST ESTIMATE IMPROVEMENTS
SPP

- Purpose
  - ITP Improvement – Establish better cost estimates which will allow SPP to do more in-house estimates and reduce outside contractor costs during ITP Assessments
- Potential Benefit(s)
  - Save time during ITP Assessments and able to perform portfolio development more efficiently
    - Project costs utilized during analysis will be on a level playing field
  - Note: In order to prepare these study estimate requests, staff has to essentially stop portfolio development and ensure the correct information is prepared to send to the stakeholders. If staff was able to develop better cost estimates internally, the portfolio development process may not need to 'hit the brakes' and can continue on
- Alignment with existing SIR
  - Potential alignment with SIR118 (Standardized Impedance Values)

SIR119 ITP IMPROVEMENTS-CONCEPTUAL COST ESTIMATE IMPROVEMENTS – CONT.
SPP

- Potential Impact(s)
  - Project costs utilized during ITP Assessments
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: High
    - Will need to be formally maintained/updated (additional costs)
    - Potential Complexity: Medium-High
    - Design: Medium-High
    - Implementation: Medium-Low
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
  - Potentially using inaccurate estimates

SIR122 TARGETED MARKET EFFICIENCY PROJECTS WITH MISO

SPP

SIR122 TARGETED MARKET EFFICIENCY PROJECTS WITH MISO
SPP

- Purpose
  - Develop and facilitate design of Targeted Market Efficiency Projects (TMEPs) with MISO
- Potential Benefit(s)
  - Provides SPP with an additional tool / process to address congestion on or near the seam with MISO
- Alignment with existing SIR
  - None

SIR122 TARGETED MARKET EFFICIENCY PROJECTS WITH MISO – CONT.
SPP

- Potential Impact(s)
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: High
    - Coordination and agreement needed with MISO
  - Potential Complexity:
    - Design: High
    - Implementation: Medium
  - Potential Compliance Impacts
    - Changes needed to the SPP-MISO JOA
- Potential Risk(s)
  - None

SIR126 ITP IMPROVEMENTS-INTERCHANGE METHODOLOGY (ESWG ACTION ITEM 201)

SPP

SIR126 ITP IMPROVEMENTS-INTERCHANGE METHODOLOGY (ESWG ACTION ITEM 201) SPP

- Purpose
  - Review the interchange methodology (ESWG Action Item 201).
    - HURDLE RATES AND INTERCHANGE
      - Hurdle rates for all futures will be based upon the latest vendor data set. However, prior to and during the Market Economic Model benchmarking and initial Years 5 and 10 of the MEM builds, SPP Staff and ESWG will be reviewing the reasonableness of the latest vendor data set hurdle rates and respective interchange.
      - SPP Staff and ESWG may utilize, as appropriate, prior ITP assessment MEMs in this review. This review may result in adjustments to the MEM hurdle rates and/or other MEM parameters that impact MEM interregional "economy-energy" transactions.
      - Any ESWG-approved adjustments and MEM interchange results will be documented in the ITP assessment report.
- Potential Benefit(s)
  - Market Economic Model Economy Interchange transparency, understanding, and ownership, and informational benefits to SPP region.
- Alignment with existing SIR
  - None

SIR126 ITP IMPROVEMENTS-INTERCHANGE METHODOLOGY (ESWG ACTION ITEM 201) – CONT. SPP

- Potential Impact(s)
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: Low
    - No major system impacts identified
  - Potential Complexity:
    - Design: Medium
    - Implementation: Medium
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
  - None

SIR127 ITP IMPROVEMENTS- MISO ENTERGY LA-TX UNIT COMMITMENTS (CONSTRAINT ASSESSMENT)

SPP

SIR127 ITP IMPROVEMENTS-MISO ENTERGY LA-TX UNIT COMMITMENTS (CONSTRAINT ASSESSMENT) SPP

- Purpose
  - ITP Improvement - Determine scope and schedule of Constraint Assessment improvements; specifically how best to include MISO, Entergy, LA/TX Unit Commitment Events and related Events; impact to congestion
- Potential Benefit(s)
  - SPP will gain a more accurate system dispatch for its neighbors, which will lead to a better overall system congestion benchmark for what occurs in real-time
- Alignment with existing SIR
  - None

SIR127 ITP IMPROVEMENTS-MISO ENTERGY LA-TX UNIT COMMITMENTS (CONSTRAINT ASSESSMENT) – CONT. SPP

- Potential Impact(s)
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: Low
    - No major system impacts
  - Potential Complexity:
    - Design: Medium
    - Implementation: Medium
  - Potential Compliance Impacts
    - None
- Potential Risk(s)
  - More complex modeling process

SIR132 AUTOMATION IMPROVEMENT-TRANSMISSION SERVICE-COST ALLOCATION DATABASE REWRITE

SPP

SIR132 AUTOMATION IMPROVEMENT-TRANSMISSION SERVICE-COST ALLOCATION DATABASE REWRITE SPP

- Purpose
  - The Aggregate Transmission Service Study (ATSS) process includes a Cost Allocation milestone.
    - This milestone takes information, such as required service upgrades, reservation details, and base plan funding eligibility, and computes information, such as upgrade costs per reservation, service deferrals, and interim redispatch.
    - A couple of examples of the analysis steps include running distribution factor analysis to determine allocation of upgrade costs among different service requests, and running shift factor analysis to determine if interim redispatch is available for service requests requiring upgrades.
  - The Cost Allocation process utilizes older database automation developed in-house. This automation is powerful and accurate, but is inefficient. It requires manual steps along the way. Due to it's complexity, platform, and structure, it is often tedious and inefficient to troubleshoot when there are input errors.
  - An overhaul and re-write of this automation would make this process faster and easier to troubleshoot.
- Potential Benefit(s)
  - An overhaul of this automation would make the cost allocation process more efficient and faster in the long run, reducing staff time for running various manual steps along the way and for troubleshooting. Since manual steps would be reduced, this could also result in reduced chances for mistakes to be made in the process.
- Alignment with existing SIR
  - None

SIR132 AUTOMATION IMPROVEMENT-TRANSMISSION SERVICE-COST ALLOCATION DATABASE REWRITE – CONT. SPP

- Potential Impact(s)
  - Impacts the Aggregate Transmission Service Studies process only
  - Potential System / Process Impacts
    - Estimate on system/process impact magnitude: Medium
    - Potential to impact an ongoing AG study process
  - Potential Complexity:
    - Design: High
    - Implementation: High
  - Potential Compliance Impacts
    - Need feedback
- Potential Risk(s)
  - Developing this new automation will require time and resources. It will also require extensive testing to verify it's accuracy.

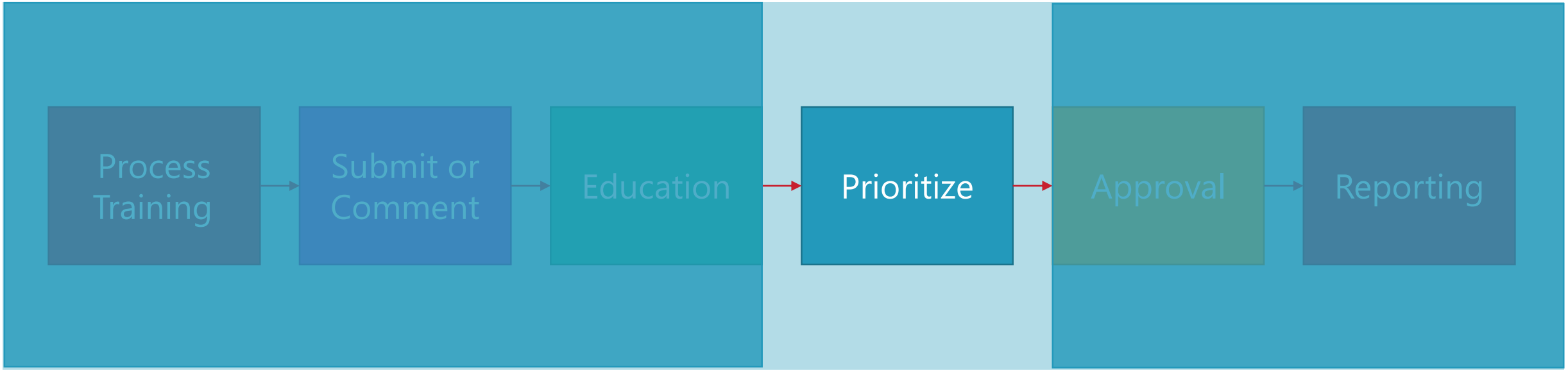
NEXT STEPS

NEXT STEPS

- SPP Roadmap Webpage
- SPP Roadmap Exploder
- Rank and Prioritize Stakeholder Meeting
  - Date and Time – TBD
- Approval Stakeholder Meeting
  - Date and Time – TBD
- MOPC and Board Approval
  - January 2022

2021 Roadmap Development Remaining Activities

- **Prioritize**
  - Informed decisions based on education
  - Collective functional area prioritization based on individual responses
  - SPP & MMU informational prioritization



- Stakeholders, SPP, and SPP MMU will participate in prioritization
  - SPP and MMU informational only
  - One prioritization per rostered company
  - Results combined to collective functional area prioritization
- Qualitative and Quantitative Prioritization – 4 tier methodology
  - Online survey
- Elective initiatives placed into priority buckets High, Medium, Parking Lot

- Mandated and board directed initiatives are not prioritized
  - Highest priority (FERC, NERC, Board)
- Initiatives near completion are not re-prioritized, priority rolls forward
  - Within 18 months from final stakeholder approval prior to implementation phase

Prioritize

INITIATIVE PRIORITIZATION

Rate initiatives for relevance

1) Subjective

Place initiatives in numerical order of importance

2) Numerical Order

Prioritize initiatives by applying a pool of points

3) Point Pool Weighted

Initiatives prioritized by combined results of step 2 and 3

4) Step 2 & 3 Combined Weighted

Survey Results

Collective Planning Prioritization

QUESTIONS