



# 2022 20-YEAR ASSESSMENT SCOPE

By SPP Engineering

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# REVISION HISTORY

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Date or version number	Author	Change Description	Comments
12/28/2020 v0.1	SPP Staff	Final Draft Scope	Posted for ESWG/TWG review for approval
01/04/2021 v0.2	SPP Staff	Updated Final Draft Scope	Updated based on comments from ESWG/TWG January 4, 2021 teleconference; posted for MOPC approval
01/11/2021 v0.2	SPP Staff	Final Scope	MOPC approval received
02/02/2021 v1.0	SPP Staff	Final Approved Scope	Posted to SPP.org

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## SECTION 1: OVERVIEW

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This document presents the scope and schedule of work for the 20-Year assessment. The Economic Studies Working Group (ESWG) and Transmission Working Group (TWG) are responsible for the creation and review of this document with approvals from the Market Operations and Policy Committee (MOPC).

### OBJECTIVE

The objective of the 20-Year assessment is to develop a long-range extra high voltage (EHV), 300 kV and above, transmission road map for the SPP region. The assessment will result in the identification of projects that economically deliver energy within the SPP region while addressing a reasonable range of future industry uncertainty. The resulting library of projects will provide a source of candidate projects that will inform shorter-term planning assessments for the purpose of injecting longer-term vision into those assessments. This 20-Year assessment scope document contains assumptions to be utilized in the 20-Year assessment that are not standardized in the 20-Year Assessment Manual.<sup>1</sup> These documents should be reviewed together for a comprehensive view of the 20-Year process and assumptions.

## SECTION 2: STAKEHOLDER PROCESS

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The stakeholder process is outlined in the 20-Year Assessment Manual.

## SECTION 3: STUDY PROCESS

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The study process is outlined in the 20-Year Assessment Manual.

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<sup>1</sup> [https://www.spp.org/Documents/59716/20\\_Year\\_Assessment\\_Manual.pdf](https://www.spp.org/Documents/59716/20_Year_Assessment_Manual.pdf)

# SECTION 4: MODELING DETAILS AND SCENARIOS (FUTURES) ASSUMPTIONS

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## 20-YEAR ASSESSMENT FUTURES

### FUTURES

The ESWG developed and approved four futures with input from the Strategic Planning Committee (SPC) and MOPC. The following futures will be utilized to create the year 2042 market economic models (MEM) which will be evaluated in the 20-Year assessment.<sup>2</sup> All modeling assumptions not incorporated in the 20-Year Assessment Manual or this scope document will follow the 2022 ITP Scope<sup>3</sup> and methodology unless directed otherwise by the ESWG and/or TWG.

#### ***Reference Case Future (Future 1)***

The reference case future will reflect the continuation of current industry trends and environmental regulations. For year 20, subject to review from generator owners, coal generators over the age of 56 will be retired, while gas fired and oil generators over the age of 50 years will be retired. Exceptions will be allowed based on stakeholder-submitted, utility-specific integrated resource plans (IRP). Long-term industry forecasts will be used to determine coal prices. Natural gas prices will be determined per the Integrated Transmission Planning (ITP) Manual.<sup>4</sup> Solar and wind additions will exceed current renewable portfolio standards (RPS) due to economics, public appeal, and current trends as reflected in historical renewable installations and Generator Interconnection (GI) requests. Battery energy storage resources will also be included relative to the approved solar amounts.

#### ***Emerging Technologies Future (Future 2)***

The emerging technologies future will be driven primarily by the assumption that electrical vehicles and distributed generation will impact energy growth rates. Coal generators over the age of 52 will be retired, while gas-fired and oil generators over the age of 48 will be retired. Exceptions will be allowed as requested by generator owners and approved by the ESWG. As in the reference case future, current environmental regulations will be assumed and coal prices will use long-term industry forecasts. Natural gas prices will be determined per the ITP Manual. This future also assumes higher solar, wind, and energy storage resource additions than the reference case due to advances in technology that decrease capital costs and increase energy conversion efficiency. This future also accounts for the potential that state and/or federal policies will promote the utilization of these technologies in an effort to modernize

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<sup>2</sup> [https://www.spp.org/Documents/59716/20\\_Year\\_Assessment\\_Manual.pdf](https://www.spp.org/Documents/59716/20_Year_Assessment_Manual.pdf)

<sup>3</sup> <https://www.spp.org/spp-documents-filings/?id=19027>

<sup>4</sup> <https://www.spp.org/spp-documents-filings/?id=19027>

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the grid. This future will align the renewable resource potential with company IRP goals to the extent possible.

### ***Accelerated Decarbonization (New administration and aggressive energy/environmental policy change) (Future 3)***

The accelerated decarbonization future is meant to reflect a new administration and an aggressive energy/environmental policy change. This is primarily reflected by all coal generators and oil generation being retired, driven by a 93 percent to 95 percent emission reductions target in 2042 from 2017 levels. The environmental regulations assumption will be based on changes in federal policy, mandated carbon cuts and a carbon tax. Natural gas prices will be determined per the ITP Manual. This future also assumes higher solar, wind, and energy storage resource additions than Futures 1 and 2 due to the change in environmental policy and changes in technology that decrease capital costs and increase energy conversion efficiency.

### ***SPP-MISO Zero Hurdle Rate (Future 4)***

The SPP-MISO Zero Hurdle Rate future is meant to focus on the potential benefit that can be realized by greater market efficiency between SPP and MISO. This future will set SPP-MISO and MISO-SPP hurdle rates to zero. All other input modeling assumptions will be held the same as Future 3.

DRIVERS				
KEY ASSUMPTIONS	Future 1 (F1) - 2022 ITP Reference Case	Future 2 (F2) - 2022 ITP Emerging Technologies	Future 3 (F3) - Accelerated Decarbonization (New administration and aggressive energy/ environmental policy change)	Future 4 (F4) - Based on SPP F3 with hurdle rate of zero between MISO and SPP
YEAR	20	20	20	20
<b>Peak Demand Growth Rates</b>	As submitted in load forecast	As submitted in load forecast	Moderate increase due to switching to electric home heating and increased electric transportation, potential shift to a winter peaking SPP	Moderate increase due to switching to electric home heating and increased electric transportation, potential shift to a winter peaking SPP
<b>Energy Demand Growth Rates</b>	As submitted in load forecast	Increase due to electrification growth	Higher demand due to electrification compared to F2 due to aggressive policy	Higher demand due to electrification compared to F2 due to aggressive policy
<b>Natural Gas Prices</b>	Current industry forecast	Current industry forecast	Increase prices influenced by emissions pricing policy	Increase prices influenced by emissions pricing policy
<b>Coal Prices</b>	Current industry forecast	Current industry forecast	Increase prices influenced by emissions pricing policy	Increase prices influenced by emissions pricing policy
<b>Emissions Prices</b>	Current industry forecast	Current industry forecast	Emission prices based on new policy	Emission prices based on new policy

DRIVERS				
KEY ASSUMPTIONS	Future 1 (F1) - 2022 ITP Reference Case	Future 2 (F2) - 2022 ITP Emerging Technologies	Future 3 (F3) - Accelerated Decarbonization (New administration and aggressive energy/ environmental policy change)	Future 4 (F4) - Based on SPP F3 with hurdle rate of zero between MISO and SPP
YEAR	20	20	20	20
<b>Fossil Fuel Retirements</b>	Coal age-based 56+, Gas/Oil age-based 50+, subject to generator owner (GO) review	Coal age-based 52+, Gas/Oil age-based 48+, subject to GO review and ESWG approval	All Coal and Oil retired. More Gas retirements, driven by higher emission reduction levels relative to F2 driven by new policy	All Coal and Oil retired. More Gas retirements, driven by higher emission reduction levels relative to F2 driven by new policy
<b>Environmental Regulations</b>	Current regulations	Current regulations	Federal Policy, mandated carbon cuts, carbon tax	Federal Policy, mandated carbon cuts, carbon tax
<b>Demand Response<sup>5</sup></b>	As submitted in load forecast	As submitted in load forecast	Increase from F2	Increase from F2
<b>Distributed Generation (Solar)</b>	As submitted in load forecast	900MW	Increase from F2 due to policy shift and significant incentives to behind-the-meter installation	Increase from F2 due to policy shift and significant incentives to behind-the-meter installation

<sup>5</sup> As defined in the MDWG Model Development Procedure Manual: [MDWG Manual](#)



DRIVERS				
KEY ASSUMPTIONS	Future 1 (F1) - 2022 ITP Reference Case	Future 2 (F2) - 2022 ITP Emerging Technologies	Future 3 (F3) - Accelerated Decarbonization (New administration and aggressive energy/ environmental policy change)	Future 4 (F4) - Based on SPP F3 with hurdle rate of zero between MISO and SPP
YEAR	20	20	20	20
<b>Energy Efficiency</b>	As submitted in load forecast	As submitted in load forecast	Increase in F2	Increase in F2
<b>Storage</b>	20% of projected solar	35% of projected solar	Increase from F2	Increase from F2
<b>Total Renewable Capacity</b>				
<b>Solar (GW)</b>	19	27	48	48
<b>Wind (GW)</b>	41	50	65	65
<b>Additional Assumptions</b>				
<b>Emissions Reduction Target</b>	N/A	N/A	93% to 95% Emissions Reductions Target in 2042 from 2017 Levels	93% to 95% Emissions Reductions Target in 2042 from 2017 Levels
<b>Hurdle Rate</b>	N/A	N/A	N/A	SPP-MISO and MISO-SPP Hurdle Rate set to \$0

Table 1: Future Drivers

## SECTION 5: ANALYSIS

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The analysis process is outlined in the 20-Year Assessment Manual.

## SECTION 6: SOLUTION DEVELOPMENT

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The analysis process is outlined in the 20-Year Assessment Manual.

### *ECONOMIC PROJECT SOLUTIONS*

SPP staff will develop a project list for each future based on benefit-to-cost ratios or net benefits. There will be a single portfolio of projects per future with no consolidation of the futures. The purpose of multiple portfolios is to provide a library of projects to inform future planning assessments of potential 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 ESGW threshold of .5 B/C will be included for further evaluation.

## SECTION 7: FINAL ASSESSMENTS

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### *SENSITIVITIES*

Sensitivities will be performed, and additional sensitivities will be scoped out at a later date by altering some of the futures assumptions. Some of the sensitivities discussed include:

- Load
- Hurdle rate/export
- Gas prices
- Renewables
- Retirement

Additional futures relevant to the sensitivity analyses will be determined via stakeholder survey leading up to this analysis, and will be documented in the 20-Year assessment report.

# SECTION 8: SCHEDULE

The 20-Year assessment began in July 2020 and will be completed by October 2022.

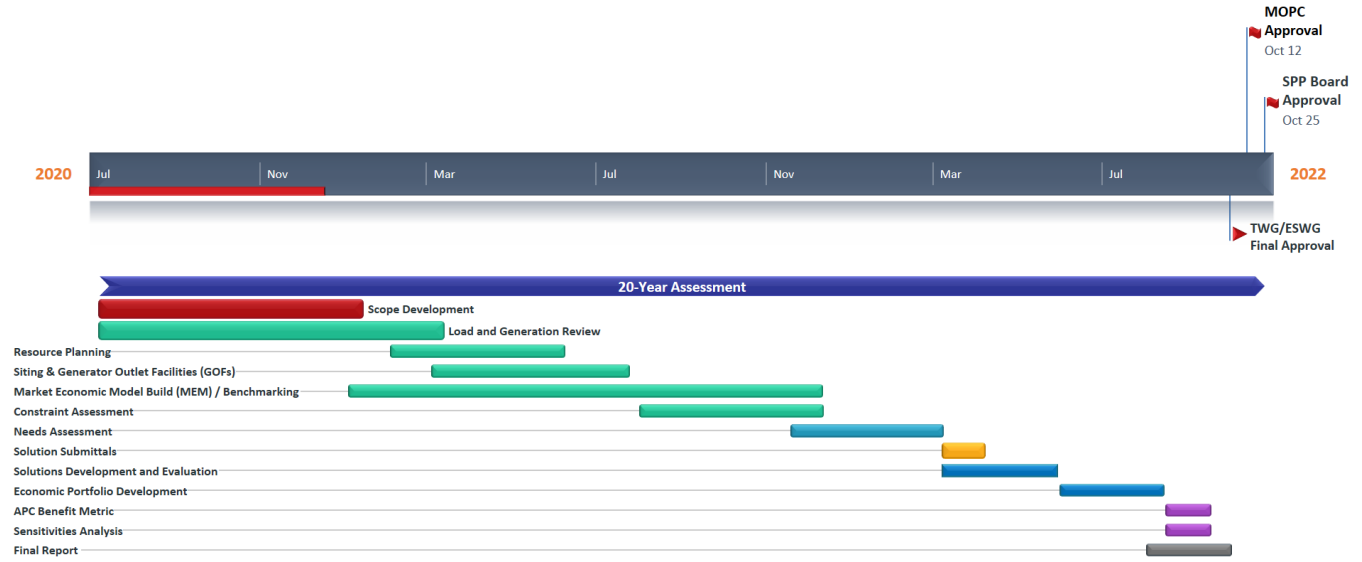


Figure 1 and Table 2 detail the study timeline.

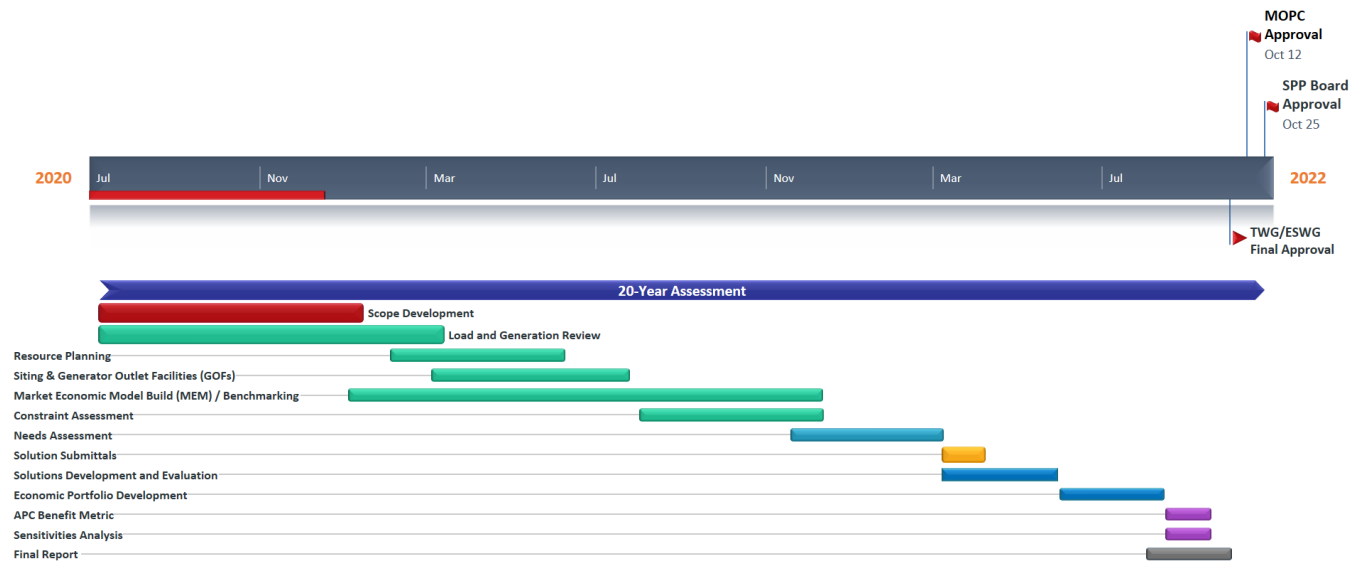


Figure 1: 20-Year assessment Timeline

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Milestone Name	Group(s) to Review/Endorse	Start Date	Completion Date
Scope Development	ESWG, TWG, MOPC, SPC	Jul 2020	Jan 2021
Load and Generation Review	ESWG, TWG, MDWG	Jul 2020	Mar 2021
Renewable Resource Plan	ESWG	Jan 2021	Mar 2021
Conventional Resource Plan	ESWG	Jan 2021	Jun 2021
Siting Plan & Generator Outlet Facilities (GOFs)	ESWG	Mar 2021	Jul 2020
Powerflow Model Development	TWG	Jul 2020	Mar 2021
Economic Model Development	ESWG	Jan 2021	Dec 2021
Model Updates after October 2021 MOPC/Board (NTC/Re-evaluations)	TWG	Oct 2021	Nov 2021
Constraint Assessment	TWG	Aug 2021	Dec 2021
Needs Assessments	ESWG, TWG	Nov 2020	Mar 2022
Solutions Development & Evaluation	ESWG, TWG	Apr 2022	May 2022
Portfolio Development	ESWG, TWG	Jun 2022	Aug 2022
Benefit Metrics Calculations	ESWG	Aug 2022	Sep 2022
Sensitivity Analysis	ESWG	Aug 2022	Sep 2022
Review Draft Report with Recommended Solutions	ESWG, TWG	Aug 2022	Sep 2022
Final Report with Recommended Solutions	ESWG, TWG	Sep 2022	Sep 2022
	RSC, SPC, SSC	October 2022	
	MOPC, SPP Board		
	MOPC, SPP Board		

Table 2: 20-Year assessment Schedule

## SECTION 9: CHANGES IN PROCESS AND ASSUMPTIONS

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To protect against changes in process and assumptions that could present a significant risk to the completion of the 20-Year assessment, any changes to this scope or assessment schedule must be appropriately vetted and follow the process outlined in the *Changes in Process and Assumptions* section of the 20-Year Assessment Manual.