SPP Southwest Power Pool

CONSOLIDATED PLANNING PROCESS - ENTRY FEE

ERSC WORKING GROUP PUBLIC WORK SESSION

DECEMBER 1, 2023

Working together to responsibly and economically keep the lights on today and in the future.

SouthwestPowerPool SPPorg southwest-power-pool

OBJECTIVES

Background:

- Current Challenges
- Benefits for Consolidated Planning Process (CPP)

Provide a summary of recent CPPTF activities:

- CPP Process flow
- CPP Entry Fee concept

BACKGROUND

THE COMPLEX PROBLEM

Vicious Cycle: the increasing number of generator interconnection requests increases delays and uncertainty, which further incentivizes developers to submit more requests

Transmission Expansion

Transmission expansion has been limited over the last decade, focused primarily on local reliability upgrades

Bulk electric grid not developing rapidly enough to support the changing resource mix, leading to inadequate transmission and high network upgrade costs assigned to generators in queue

GI Study Studies

Developers use queue requests for data collection given the low information transparency, low entry cost, high network upgrade costs, and cost uncertain uncertainty given serial nature and re-studies

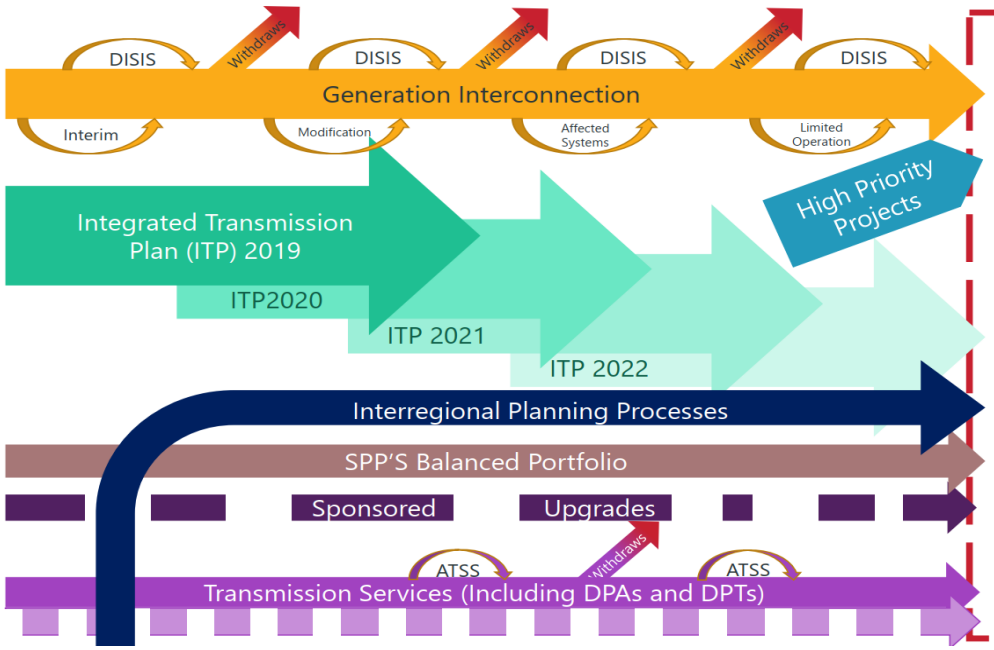
Enormous increase in number and capacity of projects in queues, creating workflow and workforce challenges when relying on existing tools and administrative processes. Studies generally result in high upgrade costs based on existing cost allocation rules.

Administration and Infrastructure

Lack of standardization, inaccurate study data & assumptions, low consideration of grid-enhancing technologies, generator technology changes, network cost assignment, and late withdrawals

Multi-year queue delays leading to re-studies, reliability concerns, high generator-pays upgrade costs, and frustrated stakeholders (developers and transmission operators alike)

Transmission solution assignment based on first to the finish line

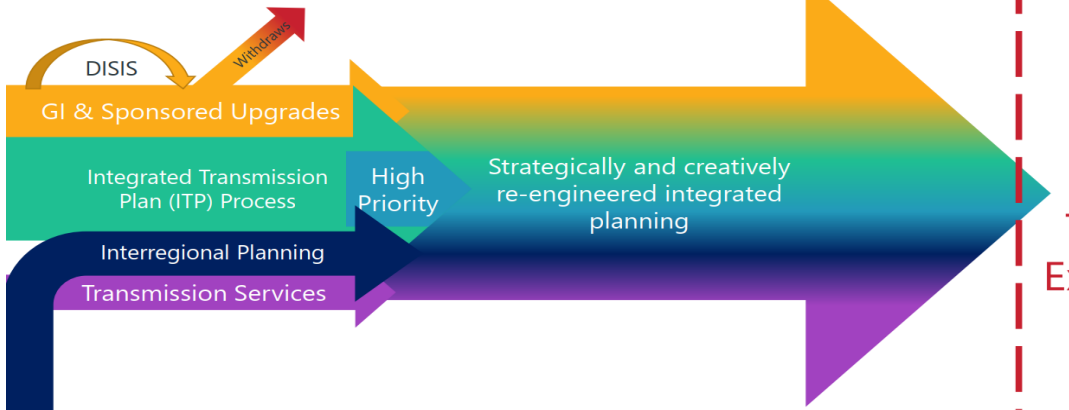


SPP's Transmission Expansion Plan (STEP)

The Consolidated Planning Process will allow for simultaneous planning of transmission, as opposed to the piecemeal approach we have today. For example, the transmission needed for Generation Interconnection and the Integrated Transmission Planning (ITP) process will be planned at the same time.

CURRENT APPROACH

CPP APPROACH



Allow for jointly funded & mutually benefiting transmission solutions

SPP's Transmission Expansion Plan (STEP)

BENEFITS OF CPP

Improved reliability by integrated analysis	• Merges regional planning with latest resource development plans, thus providing more accurate direction for future transmission needs
Cost Savings and Sharing Opportunities	• Identifies multi-driver transmission needs, optimizes transmission solutions, and provides opportunities to share transmission costs
Increased Efficiencies	• Reduces administration of multiple processes and identifies holistic transmission solutions • Additional study coordination will improve the assumptions and decision-making milestones by having all information upfront • Stakeholder involvement is likely to increase due to the comprehensive nature of the CPP
Environmental considerations	• More holistic transmission solutions may lower environmental risks that could result from a piecemeal transmission solution approach
Technology Innovation	• Enables advancement for a comprehensive infrastructure and minimizing stand-alone automation and technology needs

CPP PROCESS

DRAFT CPP PROCESS CYCLE

CPP Cycle

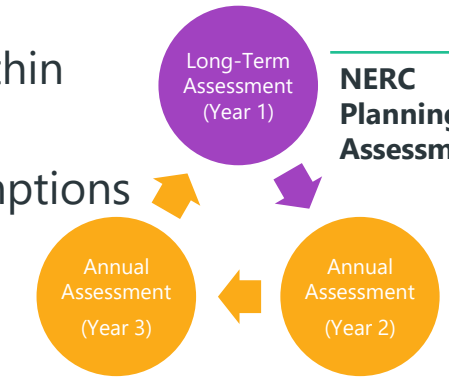
- Defined multi-year plan for up to three studies

Annual assessment

- 10 year horizon assessment (e.g. 2023 ITP)
- Built to include CPP Phase 1 study-type inclusions
- Ability to refine futures and scenario assumption

Long-term assessment

- Up to a 20 year horizon assessment
- Includes long-term assessment scope for 10 year horizon
- Provides infrastructure vision and opportunity for commitment across three long-term assessments within the CPP Cycle
- Robust regional planning futures and scenario assumptions for CPP cycle (up to three studies)

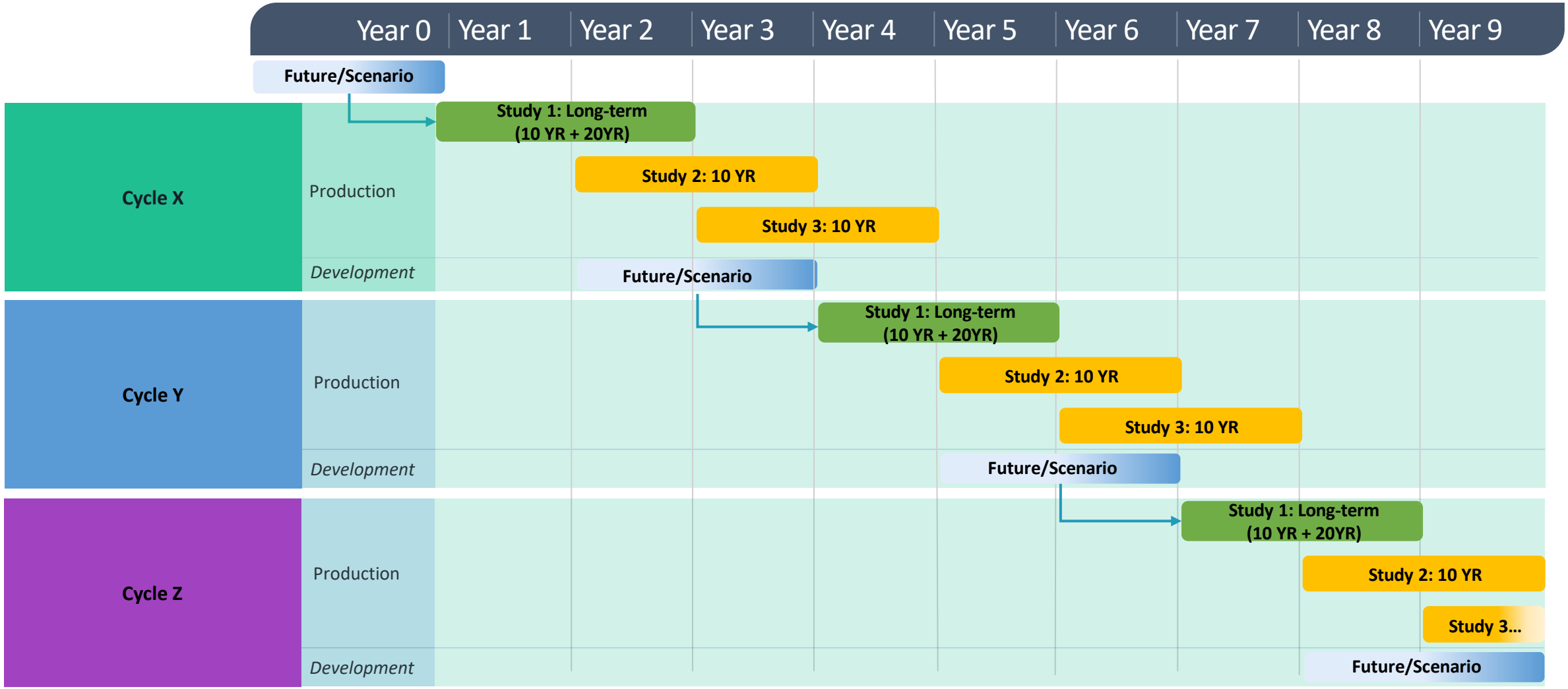


CPP Phase 1 Service & Assessments Inclusions

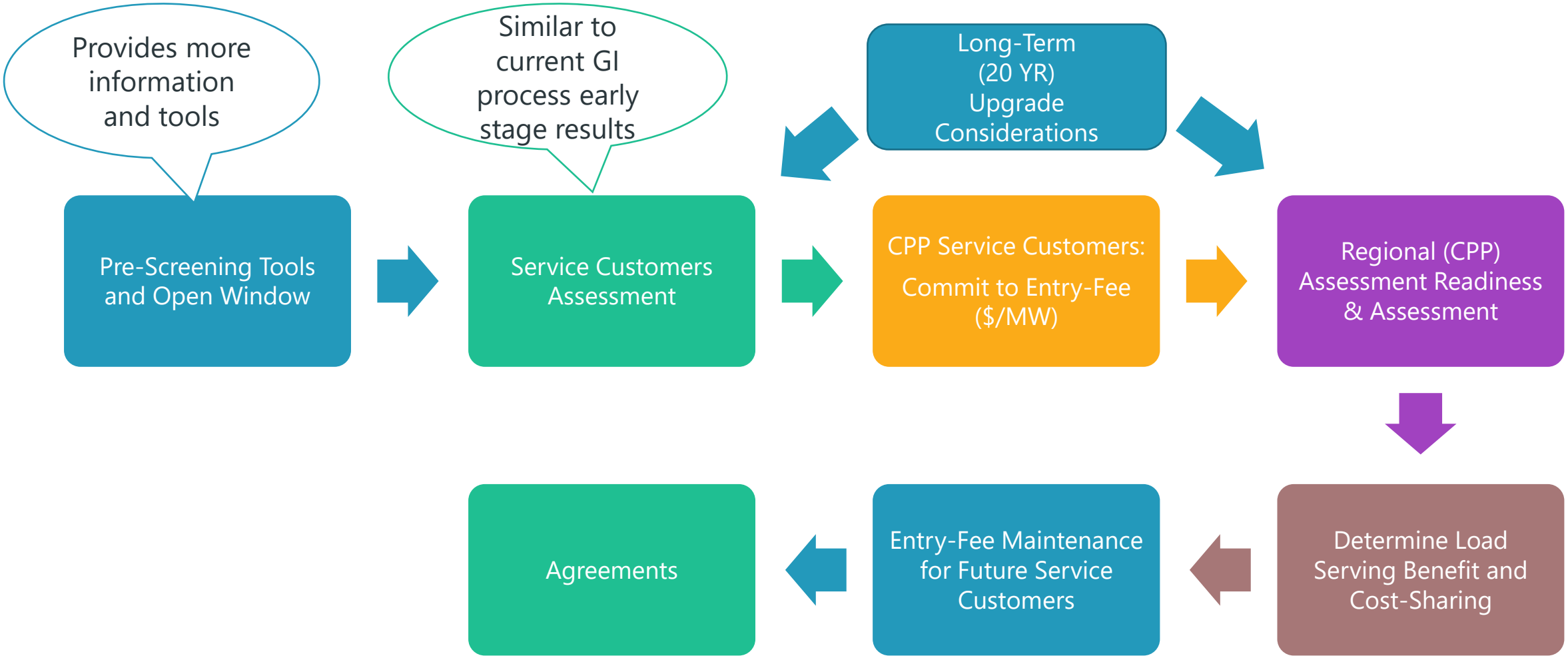
Transmission Planning	Integrated Transmission Planning (ITP)
	Project Modification/Re-evaluation
Modeling	NERC MOD-032
	SPP Tariff Models
Load Connection	Delivery point addition (AQ) included if passes screening or co-located with new generator. Otherwise stand alone process
Generator Connection	Interim as part of DISIS
	DISIS for ERIS and CRIS
	Limited Operation under DISIS
NERC Planning Assessments	TPL-001: Transmission System Planning Performance Requirements
	FAC-002: Facility Interconnection Studies

CPP MULTIPLE CYCLE

Planning for a full cycle of holistic futures and scenario development



DRAFT C1 CPP PROCESS FLOW



DRAFT ENTRY FEE DESIGN

SPP REGIONAL TRANSMISSION UPGRADE COST ALLOCATION

Upgrades to the SPP Transmission System are base plan funded through highway/byway cost allocation

- Region-wide load-ratio-share funding
- Zonal funding
- Recovered through SPP Tariff Schedule 11 rates

All upgrades eligible for highway or byway cost allocation must:

- Have an engineering and construction cost greater than $100,000
- Be issued a Notification to Construct after June 19, 2010

Voltage	Regional	Zonal
300 kV and above	100%	0%
100 kV - 299 kV	1/3	2/3
Below 100 kV	0%	100%

INTERCONNECTION CUSTOMER COST CONTRIBUTION

Regional entry fee

Contribution from GI customers to credit schedule 11 region-wide Annual Transmission Revenue Requirement (ATRR)

Develop utilizing cost of:

- 300+ kV solutions
- 1/3 of 100-300 kV solutions

Applicable to all interconnection customers

Sub-regional entry fee

Contribution from GI customers to credit schedule 11 zonal ATRR

(may require additional cost allocation policy changes)

Develop utilizing cost of:

- 2/3 of 100-300 kV solutions
- 69 kV solutions

Applicable to interconnection customers within each deliverability area

Local direct assignment

Contribution from GI customers to specific network upgrades

Develop utilizing cost of:

- Interconnection facilities/NU POI upgrades
- NU needed for sub-optimal locations

Applicable to specific interconnection customers

COST ALLOCATION CHALLENGES

Payment Timing

- Balancing payment timelines for both transmission owners and generation developers
  - Transmission owners generally prefer levelized cost payments
  - Generator developers generally prefer upfront payments

Cost Assignment Methodology

- Assigning costs based on roughly commensurate benefit from a portfolio of projects instead of cost causer pays all of a specific project

Balancing Risk and Cost Exposure

- Ensuring appropriate safe guards in place to avoid unfair shift costs

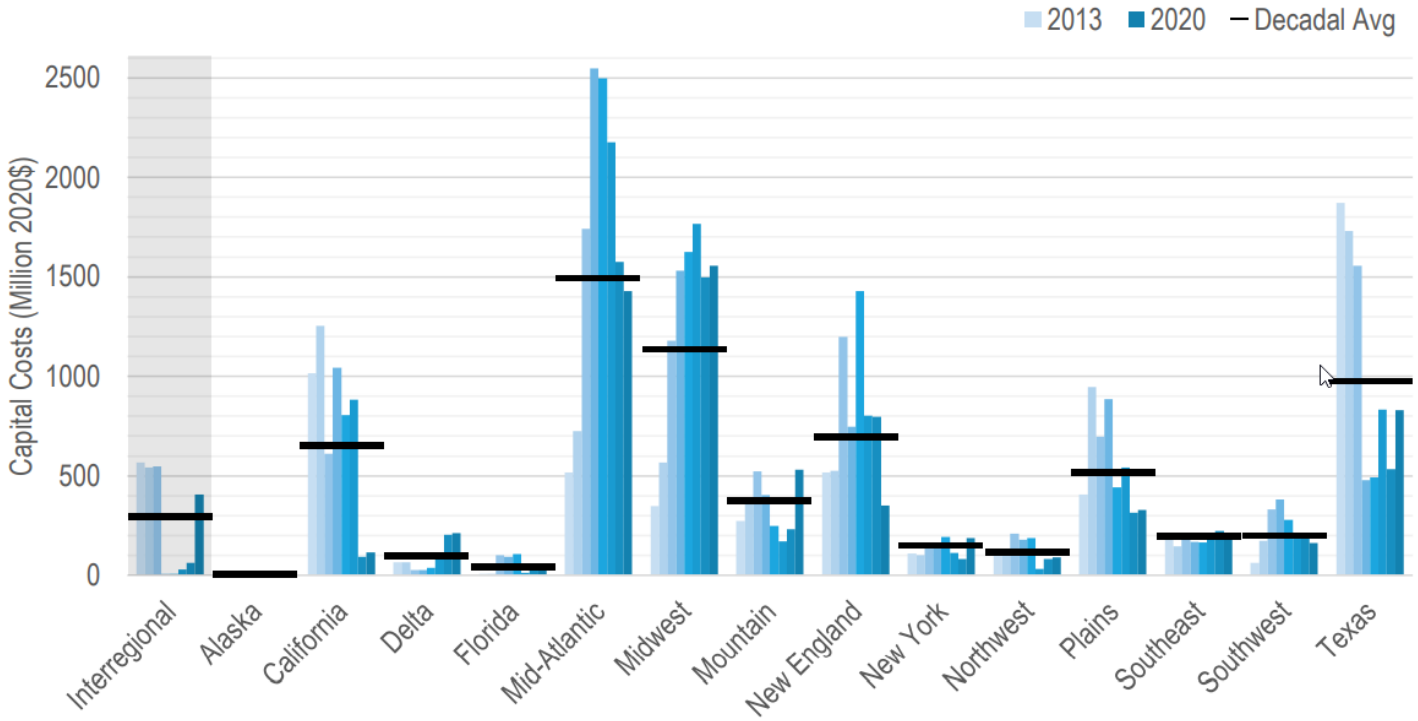
APPENDIX

BACKGROUND INFORMATION

TRANSMISSION INVESTMENT DECREASE

Transmission investment to load ratio observed recent decreases to capital investments in several regions

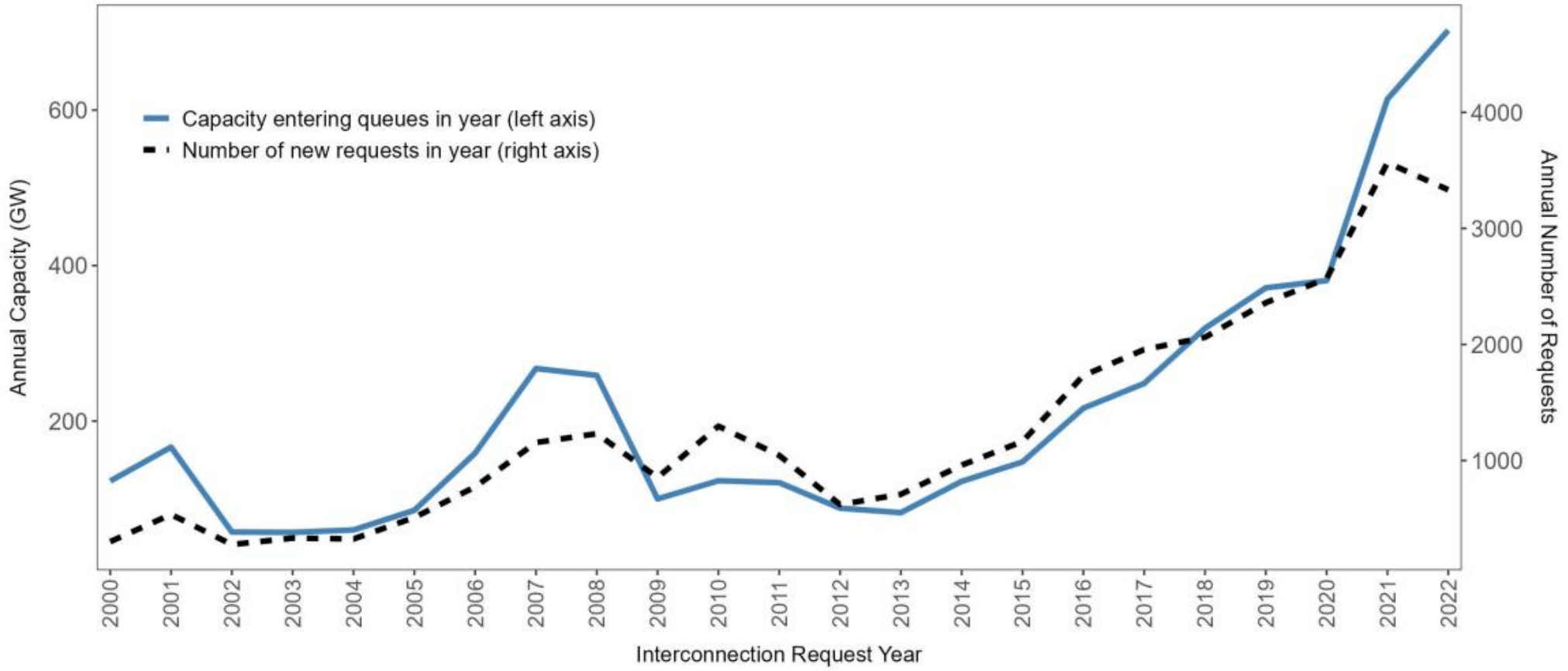
Capital costs of transmission by in-service year, 2011-2020
3-yr rolling averages plotted



Load-weighted capital costs of transmission by in-service year, 2011-2020
3-yr rolling averages plotted

DOE Transmission Needs Study: https://www.energy.gov/sites/default/files/2023-10/National_Transmission_Needs_Study_2023.pdf

INTERCONNECTION TIMELINESS CONCERNS



Decrease in new requests in 2022 likely driven by “pauses” on new requests in CAISO and PJM

Notes: (1) This total annual volume includes projects with a queue status of "active", "suspended", "withdrawn", or "operational".
(2) All values – especially for earlier years – should be considered approximate.

LAWRENCE BERKELEY LABORATORY – QUEUED UP SPP FOOTPRINT KEY FINDINGS

Reviewing historical costs to identify commercial viability parameters

Variability in Interconnection Costs

- Project-specific interconnection costs can widely differ and do not follow a normal distribution.
- For instance, between 2020 and 2022, **92% of completed projects had costs under $125/kW**, but some clustered around $220/kW, and one reached $475/kW.
- **Approximately a third of projects in this sample had costs under $15/kW.**

Stability vs. Escalation in Average Costs

- Average interconnection costs remain stable for projects that complete all studies.
- Costs for recent "complete" projects (2020-2022) are largely unchanged from the 2000s but were slightly lower in the 2010s.
- Withdrawn projects saw significant cost escalations, with costs continuing to rise in the early 2020s.

Driver of Cost Increases

- Broader network upgrade costs, especially for withdrawn projects, are the primary driver of recent cost increases.
- Costs for local attachment facilities have fallen for complete projects but increased for broader network upgrades.
- These network costs grew strongly for withdrawn projects in the 2010s and continued to climb in the 2020s.

Funded in part by U.S. Department of Energy's Interconnection Innovation e-Xchange (i2X)

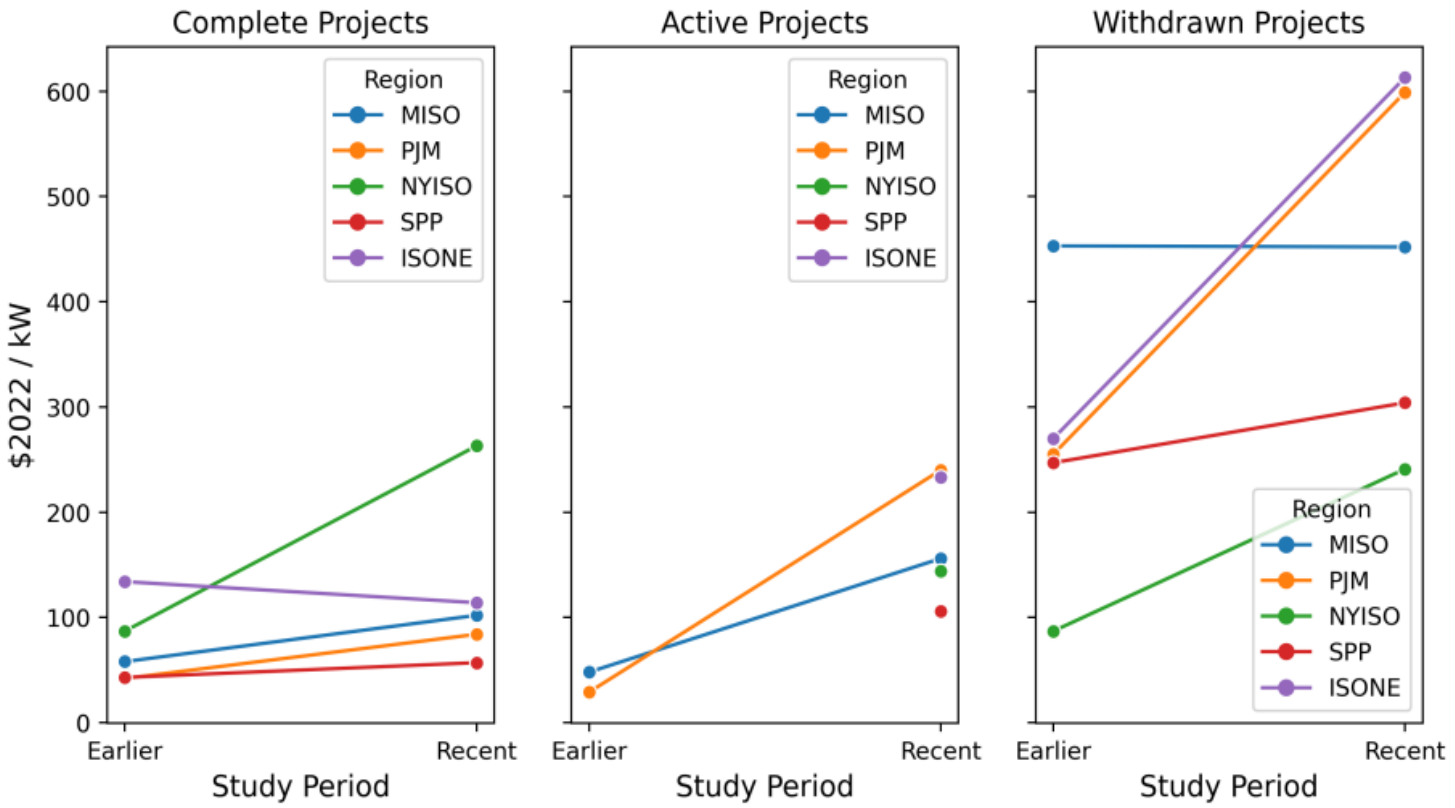
QUEUED UP – NATIONWIDE TOTAL AVERAGE COSTS

Complete: Projects that completed all interconnection studies and progressed to (or completed) the interconnection agreement phase.

Active: Projects are actively working through the interconnection study process,

Withdrawn: Projects that have been withdrawn from the queue

Total Interconnection Costs by Request Status

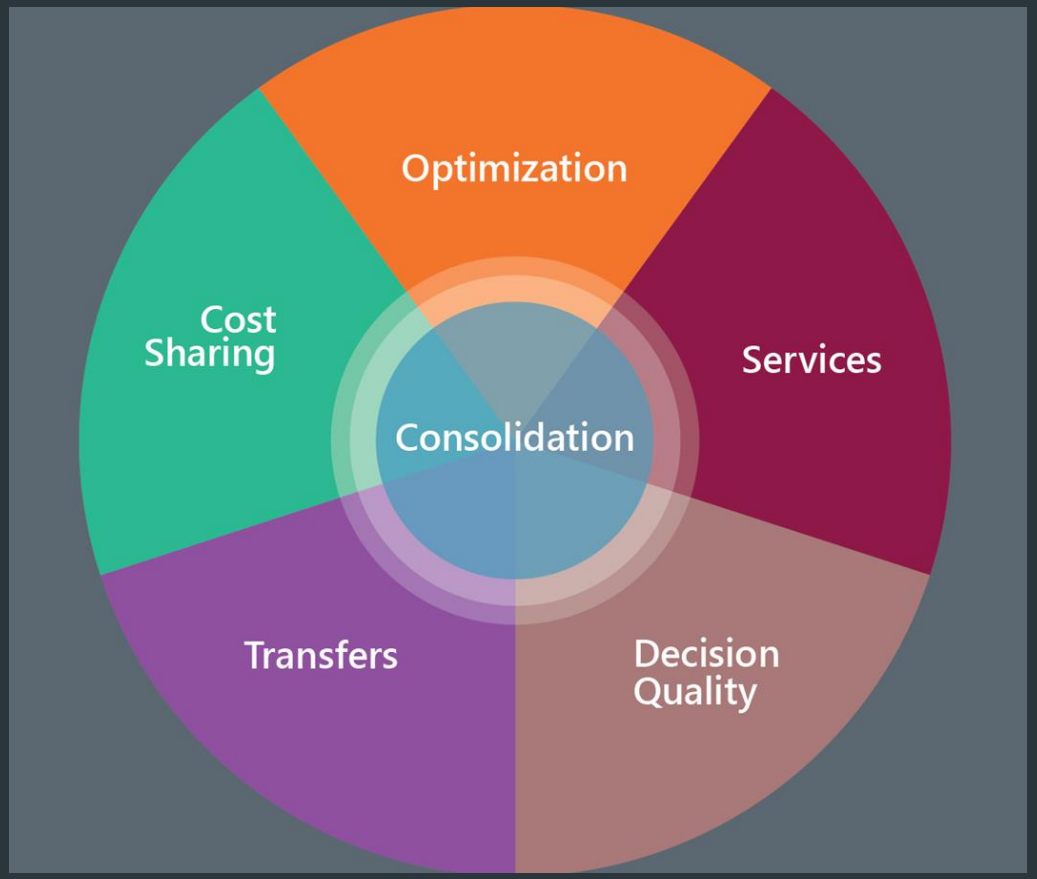


Region	"Earlier" period	"Recent" period
MISO	(2000-) 2018	2019-2021
SPP	2010-2019	2020-2022
PJM	2000/2017 - 2019	2020-2022
NYISO	2006-2016	2017-2021
ISO-NE	2010-2017	2018-2021

- Average interconnection costs have grown across regions and request types:
  - Often doubling for projects that have **completed** all studies
  - increasing even more for **active** projects currently moving through the queues.
  - Projects that **withdraw** have the highest interconnection costs

Interconnection costs have grown over time in all studied regions, driven primarily by broader network upgrades (not local interconnection costs)

SCRIPT



CONTACT:

Sunny Raheem, SCRIPT Program Business Owner and CPPTF Staff Chair
sraheem@spp.org

Kelsey Allen, Technical Lead
kallen@spp.org

Matt Jackson, CPPTF Staff Secetrary
mwjackson@spp.org

Brenda Fite, SCRIPT Program Manager
bfite@spp.org