February 2021

AMBER COHORT ROADMAP

NARUC-NASEO TASK FORCE ON COMPREHENSIVE ELECTRICITY PLANNING

NARUC
National Association of Regulatory Utility Commissioners

NASEO
National Association of State Energy Officials

Table of Contents

Introduction

This roadmap document describes a vision for an ideal comprehensive electricity planning process created by the members of the NARUC-NASEO Task Force on Comprehensive Electricity Planning – Amber cohort.[1] This idealized planning process is viewed from the state perspective, specifically a collaboration between the public utility commission and state energy office. For the purposes of this roadmap, a comprehensive electricity planning process refers to the alignment or integration of distinct planning processes that, historically, have not significantly informed one another (i.e., resource, distribution, and transmission planning processes). This roadmap includes:

- A flowchart of the entire integrated or aligned planning process.
- Brief descriptions and explanations of each section of the flowchart.
- Points of evidence for innovative planning steps that appear in the vision.

The roadmap explains the ideal, integrated planning process one section at a time, including both procedural and analytical steps in the planning processes. Each section identifies the specific innovations developed by the Amber cohort, accompanied by a brief discussion of the rationale for these changes in comparison to the status quo of electricity system planning.

1 Cohorts are groups of Task Force members from three states, organized by similar market and regulatory structures. Members of each cohort worked as a team to define and support their fictional, representative state. Each cohort was given a color name.

About Amber: A Fictional, Representative State

Structure	
Regulatory	**Our state's investor-owned utilities** own generation assets
Market	**Our state is located** within an RTO/ISO market
Planning Processes	**Our state is seeking to align** distribution, resource, and transmission planning processes
Additional Characteristics	
A few other characteristics you should know	• Because transmission-owning utilities participate in an RTO, the cohort is considering two distinct and parallel transmission planning processes: one conducted by the utilities and the other by the RTO • We are facing increased weather-related damage and costs • New transmission and generation siting driven by supply fleet transition and load growth • Very limited or no retail competition
We are doing this because we want to accomplish	• Effective, cohesive, and coherent planning processes that are able to achieve state policy goals
While keeping in mind	• Flexibility of system • State policy achievement • Enabling future transformation • Efficient regulation • Reliability, safety, affordability, resilience • Least cost, reasonable rates • Efficiency • Utility health • Cybersecurity
And trying to be responsive to	• Digitization • Decarbonization/ carbonization • Flexibility and adaptability • Resiliency • Cybersecurity threats • Climate change • Electrification

The roadmap is intended to support states considering taking actions to increase the alignment of their own electricity system planning processes by providing:

- A high-level understanding of the sequence of steps included in an electricity planning process.
- Descriptions of the innovations introduced by the cohort and represented in the vision.
- Starting points for all states, particularly those with similar characteristics to the Amber cohort.

How to Read the Roadmap

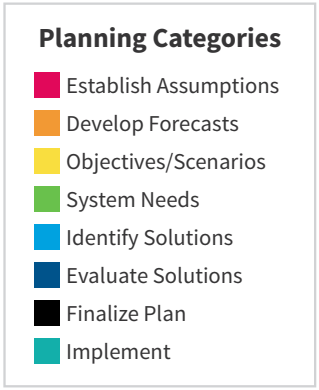
The roadmap describes the substantive activities, specific milestones, regulatory actions, and other deliberate aspects of this cohort's vision that comprise an ideal planning process. It describes the necessary sequences, dependencies, and relationships among steps, actions, and information flows (e.g., where the outputs from one step are leveraged as inputs to the next step), depicted by arrows.

- The roadmap contains **guidance, resources, and examples** of emerging and promising approaches currently being implemented, which offer points of evidence for innovations that states and utilities have already incorporated into their efforts, demonstrating the feasibility of these approaches. In places where no guidance, resources, or examples are included, new efforts might be needed to enable or demonstrate an innovation's viability.
- The roadmap uses a **color key**—outlining each box in the flowchart—to allow for comparison with other Task Force cohort roadmaps. The colors align with eight generalized procedural and analytical planning steps that typically characterize electricity system planning processes. For further descriptions of these general steps, see the two-page briefing paper *Aligning Integrated Resource Planning and Distribution Planning – Standard Building Blocks of Electricity System Planning Processes*.[2]

The roadmap does not place planning steps on a timeline or calendar and does not indicate a responsible entity or actor for various steps because such details will necessarily vary across states.[3]

Guidance, resources, and examples are accompanied by this symbol:

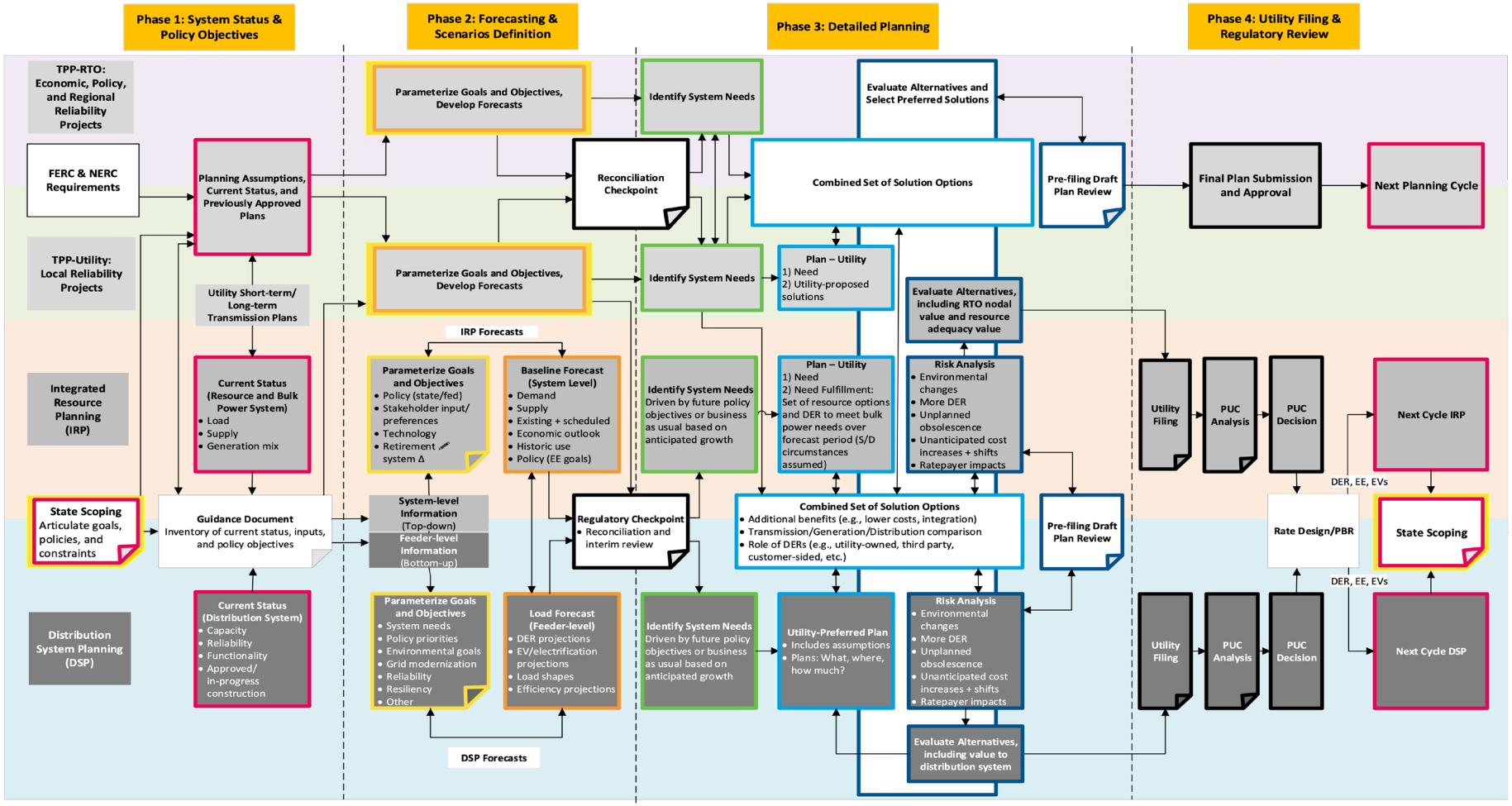
Color key used in flowchart and vision summary:



2 Kristov, Lorenzo. "Aligning Integrated Resource Planning and Distribution Planning: Standard Building Blocks of Electricity System Planning Processes." Discussion Draft for NARUC- NASEO Task Force on Comprehensive Electricity Planning. July 2019.

3 While timing differences between processes are important, timelines were not broken out in order to reduce the number of complexities when mapping the relationships between the distribution, resources, and transmission processes.

Amber Cohort Flowchart of Idealized Comprehensive Electricity Planning Process



Key

Planning Categories

- Establish Assumptions
- Develop Forecasts
- Objectives/Scenarios
- System Needs
- Identify Solutions
- Evaluate Solutions
- Finalize Plan

Process Steps

- Establish Assumptions
- Develop Forecasts
- Objectives/Scenarios
- System Needs
- Identify Solutions

Acronyms

D: Distribution
DER: Distrubted Energy Resources
DR: Demand Response
DSP: Distribution System Planning
EE: Energy Efficiency
EVs: Electric Vehicles
FERC: Federal Energy Regulatory Commission
G: Generation
IRP: Integrated Resource Planning
NERC: North American Electric Reliability Corporation
PBR: Performance-based Ratemaking
PUC: Public Utilities Commission
RTO: Regional Transmission Organization
S/D: Supply and Demand
T: Transmission
TPP: Tranmission Planning Process

Amber Roadmap Features

The Amber flowchart includes the process steps and relationships between of Transmission (TPP), Resource (IRP), and Distribution (DSP) planning processes. The TPP is represented as two rows: the top row for the RTO TPP focuses on economic, policy, and regional reliability projects; the second row for the Utility TPP focuses on local utility reliability planning. These two related processes are characteristic of multi-state RTOs. Both the RTO and the utilities play a role in transmission reliability planning and they coordinate with one another. In California, these two TPPs are collapsed into one TPP that encompasses all types of transmission upgrade needs and projects.

These planning processes are not one-time activities; rather, they are typically performed on regular cycles recurring every 1 to 3 years depending on the process. Thus, the outcomes of one planning cycle become inputs to subsequent cycles. Similarly, once a planning cycle is completed and the plan is formally approved, there are other activities required to implement the approved solutions and the results of these implementation activities can also provide inputs to subsequent planning cycles. The flowchart and roadmap acknowledge that these inter-cycle linkages exist but do not describe them in any detail.

The flowchart also does not show certain important underpinning activities that the four planning processes depend on. Amber cohort participants discussed three such activities that need to be considered if a state intends to implement the process coordination described here.

- Access to information by participants in the planning processes, which is relevant at multiple points. For example, early in the process, developers of distributed energy resources (DERs) will need information on distribution circuit-level hosting capacity to target DER development to locations with available capacity. Later in the process, developers of non-wires alternatives (NWA) to traditional infrastructure upgrades will need information on specific upgrade needs to develop NWA proposals that best address system needs.
- Creating an informed, up-to-date basis for evaluating new technologies that offer potential solutions to needs identified in the planning processes. New technologies often lack a track record that can give grid operators confidence in their performance capabilities and reliability, and their costs can vary significantly from one planning cycle to the next. These factors challenge the ability to perform a traditional benefit-cost assessment to determine the preferred solution to any given need and may lead to rejection of a potentially cost-effective new technology solution in favor of a familiar solution. More integrated planning requires processes for obtaining reliable current information on non-traditional technology options.
- Empowering an entity or entities (agency or utility) to access the data, create the infrastructure, and develop the methodological underpinnings to dispatch, quantify, and compensate load-based and other DERs.

The Amber cohort structured their flowchart in four sequential phases, described in detail further below.

- Phase 1 establishes system status assumptions, including scheduled additions to and retirements from the power system, and identifies policy objectives that will guide planning. As such, Phase 1 establishes a common foundation for the various planning processes.
- Phase 2 identifies the different forecast scenarios that planning must consider and develops the needed forecasts for the planning horizon.
- Phase 3 involves the detailed planning activities, including engineering studies, identification of needs and possible solution options for meeting the needs, and comparative assessment of the options to determine the preferred set of solutions. Phase 3 includes a holistic review across all four planning processes to identify the optimal set of solutions that collectively address all the needs and culminates in draft resource, distribution, and transmission plans that are published for stakeholder review prior to formal submission for approval by the relevant body.
- Phase 4 is the formal process whereby a regulatory commission or an RTO governing board approves the plans.

The Amber cohort envisioned several innovative steps that represent a departure from traditional planning practices. These innovations include:

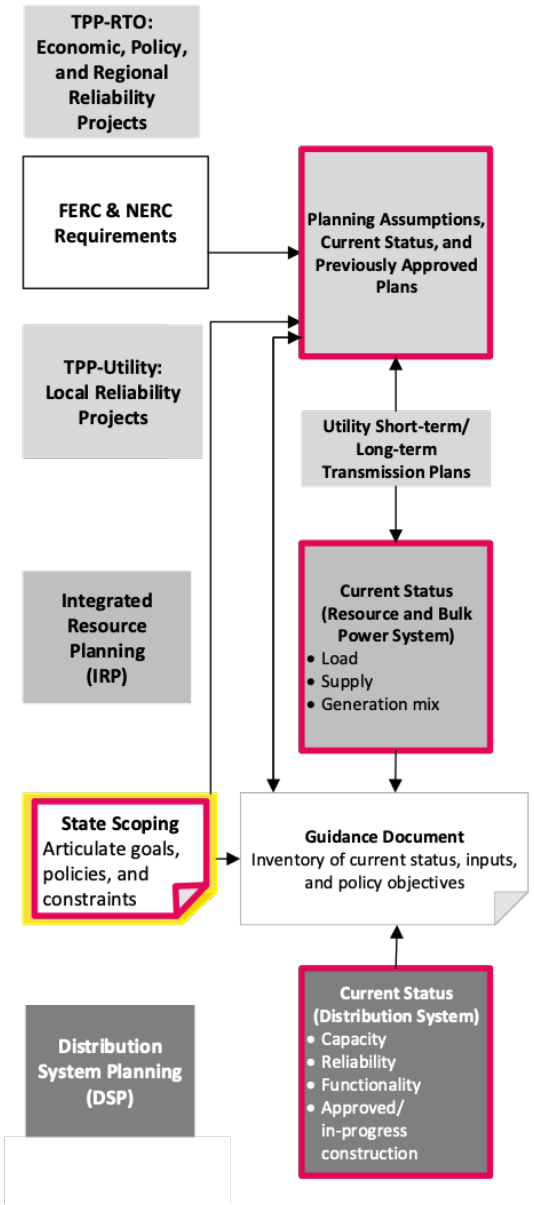
- **Creation of a guidance document** at the end of Phase 1 that captures a common view of the current electric system status, including scheduled additions and retirements, and specifies the policy objectives that planning must take into account. This is intended to be a public document that has some formal status at the state commission level and is used as a common foundation or consistency check across IRP, DSP, and Utility TPP, and provided as state input to the RTO TPP.
- **A reconciliation checkpoint** at the end of Phase 2 that compares the scenario specifications and related forecasts developed in distinct planning processes to assess consistency, where needed, and to document and provide a rationale for any appropriate differences.
- **A combined set of solution options** to meet identified needs across all distinct planning processes to enable a whole-system review of options to determine the optimal set of solutions that collectively meet all needs.
- **Final draft plans** for each process that are published for stakeholder review and comment prior to submission for formal approval by the regulatory or governing body.

Phase 1: System Status and Policy Objectives

The process steps carried out in Phase 1 set the common foundation for the rest of the planning cycles. Known information about the systems—including scheduled additions to and retirement of facilities from the systems over the planning horizon, as well as policy objectives that the planning processes should consider—are documented in Phase 1 and shared with stakeholders through a guidance document before moving to the Phase 2 analysis.

As a preliminary process step, the intended **State Scope** of the planning processes is identified at the state level to apply to the IRP, DSP, and TPP. This initial step includes articulating the state goals for the outcomes of the planning processes, the policies that outline the intended direction of the planning processes, and the planning process constraints. The outcomes of stakeholder engagement at this initial stage help set the course for the rest of the planning processes. It is also important at the beginning of Phase 1 to **review and confirm that the forecast assumptions** are reasonably consistent across the Distribution, IRP, and Transmission Planning processes. TPP planning assumptions for both the RTO and the individual utilities are also shaped by Federal Energy Regulatory Commission (FERC) and North American Electric Reliability Corporation (NERC) requirements.

This stage of the planning cycle incorporates previously approved **Utility Short-term and Long-term Transmission Plans**, with information such as voltage, location, scheduled in-service dates, drivers, retirements, and financing. These plans impact TPP and IRP planning assumptions and set the foundation for the **current status of the system**. The current status of the system includes information about the assets and facilities, such as current projects in progress and projects that have been approved for development, along with the associated timelines.



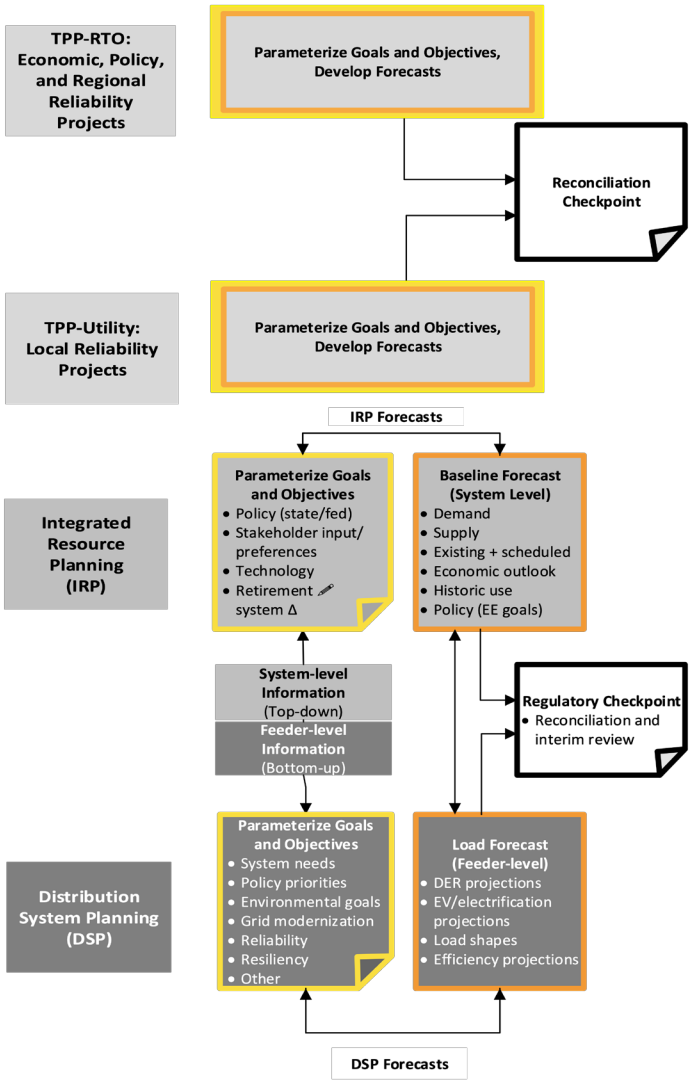
The state scoping information, along with current system status information for DSP, IRP, and TPP, feeds into the **Guidance Document**, which is a public document that is formally adopted or acknowledged by the State Utilities Commission in some manner. The purpose of this document is to have a common foundation that applies to all planning processes, with the caveat that a given state's influence on the TPP of a multi-state RTO may be less than its influence on its jurisdictional utilities' planning processes.[4]

For example, one state in an RTO may have a goal for 100% renewable energy by a certain date, which is not a common goal for all states in the RTO. The planning processes of the state's jurisdictional utilities will incorporate this goal and any other relevant state guidance into the assessment of needs and consideration of solution options. The guidance document is also an opportunity for stakeholder review and comment before it is finalized. Once the guidance document is finalized and included in the procedural record for the state's planning processes, it should be referred to throughout the subsequent phases to ensure that later decisions are aligned with state policy goals. For example, the regulatory checkpoint in Phase 2 and the pre-filing draft plan in Phase 3 could be assessed for alignment with the policy provisions in the guidance document.

4 FERC requires RTOs to incorporate both state policy and utility plans into their regional planning processes: "Local and regional transmission planning processes must consider transmission needs driven by public policy requirements established by state or federal laws or regulations. Each public utility transmission provider must establish procedures to identify transmission needs driven by public policy requirements and evaluate proposed solutions to those transmission needs." https://www.ferc.gov/industries-data/electric/electric-transmission/order-no-1000-transmission-planning-and-cost

Existing Guidance, Resources, and Examples

- **Key commission decisions regarding an [Integrated Distribution Planning] IDP proceeding; stakeholder involvement**. Mid-Atlantic Distributed Resources Initiative. Integrated Distribution Planning for Electric Utilities: Guidance for Public Utility Commissions. October 2019. pp. 6–9, 421.
- **Planning objectives and criteria**. NARUC-NASEO Task Force on Comprehensive Electricity Planning. Planning Criteria Metrics for Distribution System Planning. September 25, 2019. Webinar slides and recording.
- **Establishing planning assumptions for multiple planning processes**. Alignment of Key Infrastructure Planning Processes by CPUC, CEC and CAISO Staff. December 23, 2014, pp. 3–4.
- **Integrated resource planning**. NARUC–IRP Basics. October 14–16, 2013.
- **Integration of integrated resource planning and transmission planning**. Colorado PUC Rule 3627 Stakeholder Meeting. Xcel Colorado IRP Overview. August 16, 2019.
- **Integrated resource planning best practices**. RAP and Synapse. Best Practices in Electric Utility Integrated Resource Planning: Examples of State Regulations and Recent Utility Plans. June 2013.
- **Integrated resource planning filing example**. Xcel Energy. Xcel-Minnesota's 2019 IRP Overview. 2020–2034 Upper Midwest Integrated Resource Plan – Public Meeting presentation. Filed with the Minnesota Commission on April 3, 2019.



Phase 2: Forecasting and Scenarios Definition

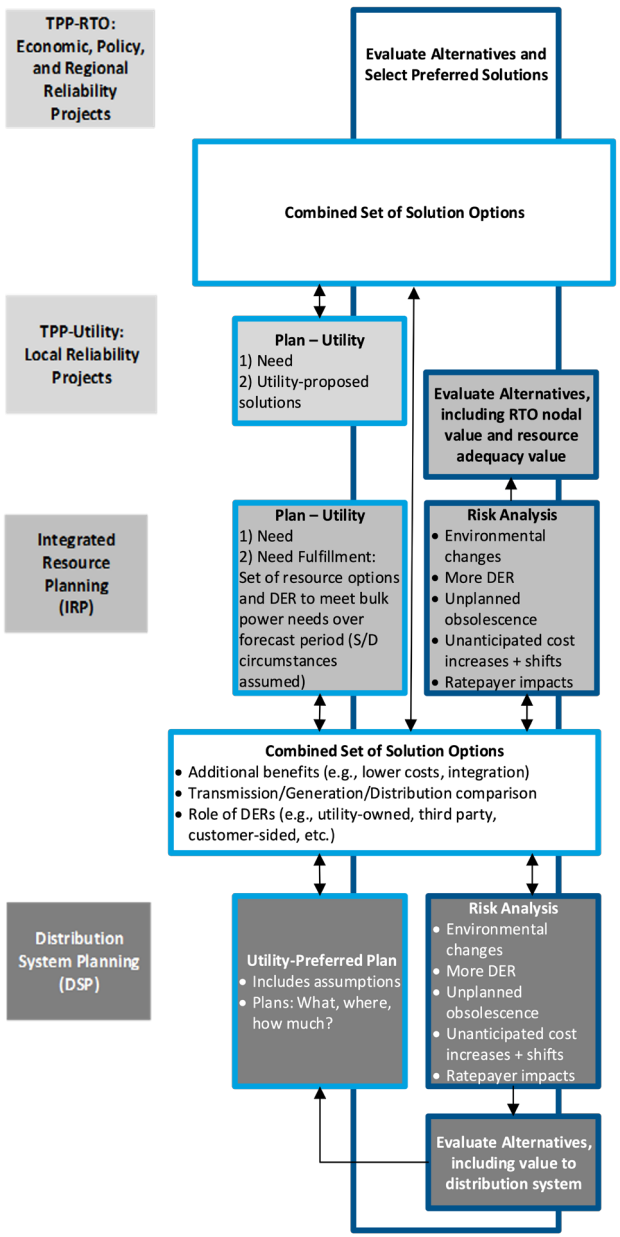
Phase 2 entails identifying the forecast scenarios of interest, taking into account the system assumptions and policy objectives documented in the Guidance Document, and developing the needed forecasts. At the end of phase 2, there is a second regulatory checkpoint to review alignment with the other planning processes before the detailed planning analysis begins.

Goals and objectives are parameterized for each planning process, translating the higher-level state goals into system-level specific scenarios and desired outcomes and milestones.

There is a **regulatory checkpoint for reconciliation and interim review** at the end of Phase 2 that provides an opportunity to check consistency across the forecasts developed in the IRP, DSP, and TPP processes. This checkpoint looks at the forecasts and scenarios developed in Phase 2 and allows for stakeholder input. Due to the nature of the different planning processes, a bottom-up forecast (e.g., for circuit-level distribution planning) might differ from a top-down forecast (e.g., for system-level resource planning), and those differences are highlighted and documented at this review step. Phase 2 ends with a written record of the forecasting results and summarizes all information developed in Phase 1 and Phase 2. There may or may not be a formal adoption of the checkpoint documentation by the state commission.

Existing Guidance, Resources, and Examples

- **Distribution system planning objectives**. Michigan Public Service Commission Staff. Electric Distribution Planning Stakeholder Process: MPSC Staff Report. April 1, 2020. pp. 27–29.
- **Integrating processes over different time horizons**. LTPP, TPP and IEPR Process Alignment for CPUC, CAISO and CEC. 2014.
- **Incorporating resilience in planning objectives**. NARUC-NASEO Task Force on Comprehensive Electricity Planning. Integrated Distribution Resilience Planning. May 26, 2020. Webinar recording.
- **Planning objectives, stakeholder engagement**. Hawaiian Electric Company's Integrated Grid Planning Process. Planning Hawaii's Grid for Future Generations: Integrated Grid Planning Report. March 1, 2018. pp. 5, 12–18.
- **Aligning planning forecasts with state energy policy**. California Integrated Energy Policy Report Process. 2020 Integrated Energy Policy Report Update. California Energy Commission. March 2020.
- **Forecasting**. Mills, Andrew D. Forecasting load on the distribution and transmission system with distributed energy resources. Lawrence Berkeley National Laboratory, Distribution Systems and Planning Training for Midwest Public Utility Commissions. January 16–17, 2018. Presentation.
- **Load forecasting**. Lawrence Berkeley National Laboratory. Load Forecasting in Electricity Utility Integrated Resource Planning. October 2016.



Phase 3: Detailed Planning

Identify System Needs
Driven by future policy objectives or business as usual based on anticipated growth

In Phase 3 the planners perform the planning studies and analyses to identify infrastructure needs that will arise during the planning horizon. Next, there must be processes for identifying potential solutions to meet the needs, followed by procedures for evaluating the options and determining the preferred set of solutions to meet all needs. At the culmination of Phase 3, draft plans incorporating the preferred solutions will be provided for review and comment by stakeholders prior to submission of the plans for formal commission review and action.

Based on anticipated growth and other relevant forecasts, policy objectives, and other factors identified in the Phase 1 Guidance Document, the planners identify **system needs**. Typically, the state's utilities will offer their plans to address needs in the IRP, TPP, and DSP **utility plans**. In addition, there may be opportunities for other parties to offer solutions for consideration by the planners in order to have a wider range of options, including, for example, distribution-level resources and facilities that may offset the need for a transmission or distribution upgrade.

The **Combined Set of Solution Options** represents the idea of assembling a complete set of potential solution options for review in a holistic manner for meeting the needs identified in each of the planning processes. The Combined Set of Solution Options and the tall vertical **Evaluate Alternatives and Select Preferred Solutions** box comprise a major focus of how planning will work in the future with more participants and a greater range of solution options across processes than in the past. For distribution planning, the set of solution options has traditionally been entirely internal to the utility; however, as we transition into systems with higher DER penetration and possibilities for non-wires alternatives, there's a desire for more third-party solutions to be considered. A combined set of options is a good way to look at touchpoints between the systems. Once solutions have been identified in separate processes, then **solutions can be evaluated** across processes to see how solutions identified in one process can contribute to needs identified through another process.

Risks are identified throughout the processes but become especially important in evaluating options where unconventional solutions may involve new and evolving technologies. Analysis of the risks helps determine which solutions to move forward within the plans by considering risks regarding performance, cybersecurity, environmental changes, obsolescence due to rapid technology change, or unanticipated costs.

In the transition between Phases 3 and 4, the preferred solutions identified in Phase 3 are compiled into a **Pre-filing Draft Plan**, which is published for stakeholder review and comment. The input from stakeholders on the draft plan flows back into the process steps of Phase 3 outlined above and may result in modifications to the plans prior to final submissions for formal regulatory review in Phase 4. Developing a pre-filing draft plan in Phase 3 for stakeholder review is a substantial change from the way things are currently done, particularly for the DSP. This allows planners to ensure buy-in and work out the challenges in advance of formally filing a plan.

Existing Guidance, Resources, and Examples

- **Describing clear and concise planning criteria early in the process**. NARUC-NASEO Task Force on Comprehensive Electricity Planning. Planning Criteria Metrics for Distribution System Planning. September 25, 2019. Webinar recording.
- **Stakeholder involvement**. Public Service Commission of the District of Columbia. DC MEDSIS Stakeholder Working Group Report. Prepared by Smart Electric Power Alliance. May 31, 2019.
- **Needs assessment and evaluation; stakeholder involvement**. California Public Utilities Commission. Decision on Track 3 Policy Issues, Sub-Track 1 (Growth Scenarios) and Sub-Track 3 (Distribution Investment and Deferral Process). Decision 18-02-004. February 8, 2018.
- **Non-wires solutions implementation.** Rocky Mountain Institute. The Non-Wires Solutions Implementation Playbook: A Practical Guide for Regulators, Utilities, and Developers. 2018.
- **Identifying system needs and sourcing solutions**. Joint Utilities of New York NWA Identification and Sourcing Process and Notification Practices. Supplemental Information on the Non-Wires Alternatives Identification and Sourcing Process and Notification Practices. Filed with the New York Public Service Commission on May 8, 2017.
- **DER aggregation and dual participation**. FERC's filing on DER aggregation in New York Independent System Operator, Inc. Order Accepting Tariff Revisions and Directing Compliance Filing and Informational Report. January 23, 2020.
- **Evaluation of non-traditional solutions**. Strategen Consulting. MN Energy Storage Use Case Analysis: Peaker Substitution. Presentation provided on July 11, 2017.

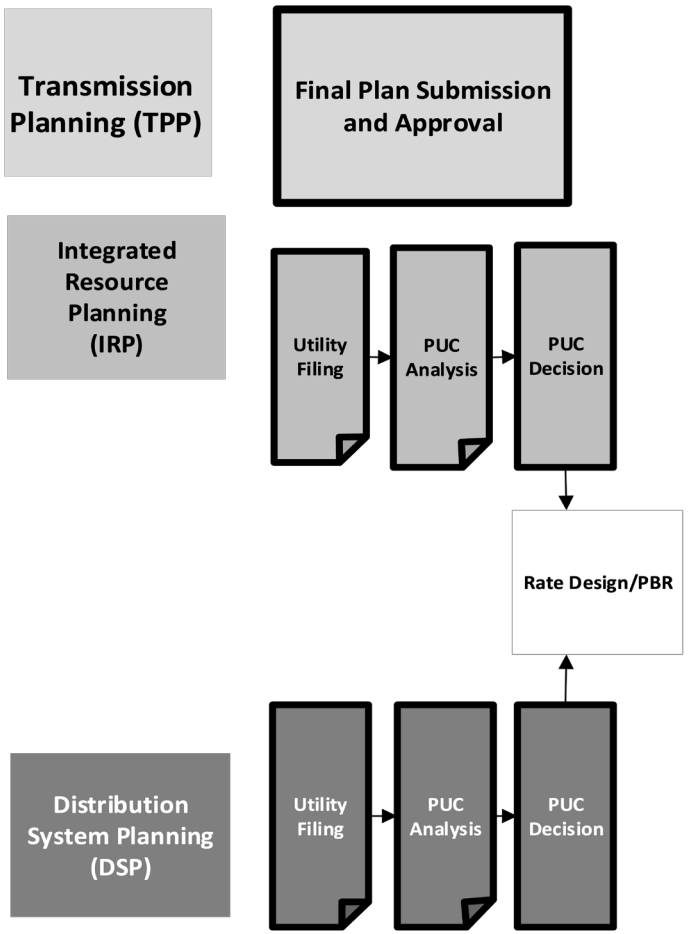
Phase 4: Utility Filing and Regulatory Review

After the analysis is completed in Phase 3 and stakeholder comments on the draft plans are received and considered, the information is formalized into a utility plan that is submitted for regulators to review and rule on. In the case of the RTO TPP, the plan would typically be submitted to the RTO's governing board for approval. Once plans are formally approved for implementation, the outcomes of the planning cycles up to this point become input into the next planning cycles and state scoping objectives.

In Phase 4, after the needs have been identified and preferred solutions have been determined, the utility finalizes their plan, which undergoes **analysis by the Public Utilities Commission (PUC or Commission)**. There is also a formal comment period for stakeholders to provide inputs to the Commission regarding the utility plan, before the **PUC issues a formal decision**. The cohort expects that the volume of stakeholder intervention in the Commission proceedings will be less than in the past due to the opportunity stakeholders had to review and comment on the pre-filing draft plans. As part of the formal process, the Commission or stakeholders may seek **independent expert input to help** inform their analysis, if needed.

The decision of the PUC within each planning cycle may result in the introduction of other types of solutions besides new infrastructure. For example, new **rate designs and performance incentives could be offered**, particularly in the IRP and DSP processes, to promote energy efficiency and demand response program participation. This could result in the deployment of more DERs, such as wind or solar generating facilities and electric vehicles, which all feed into future planning cycles.

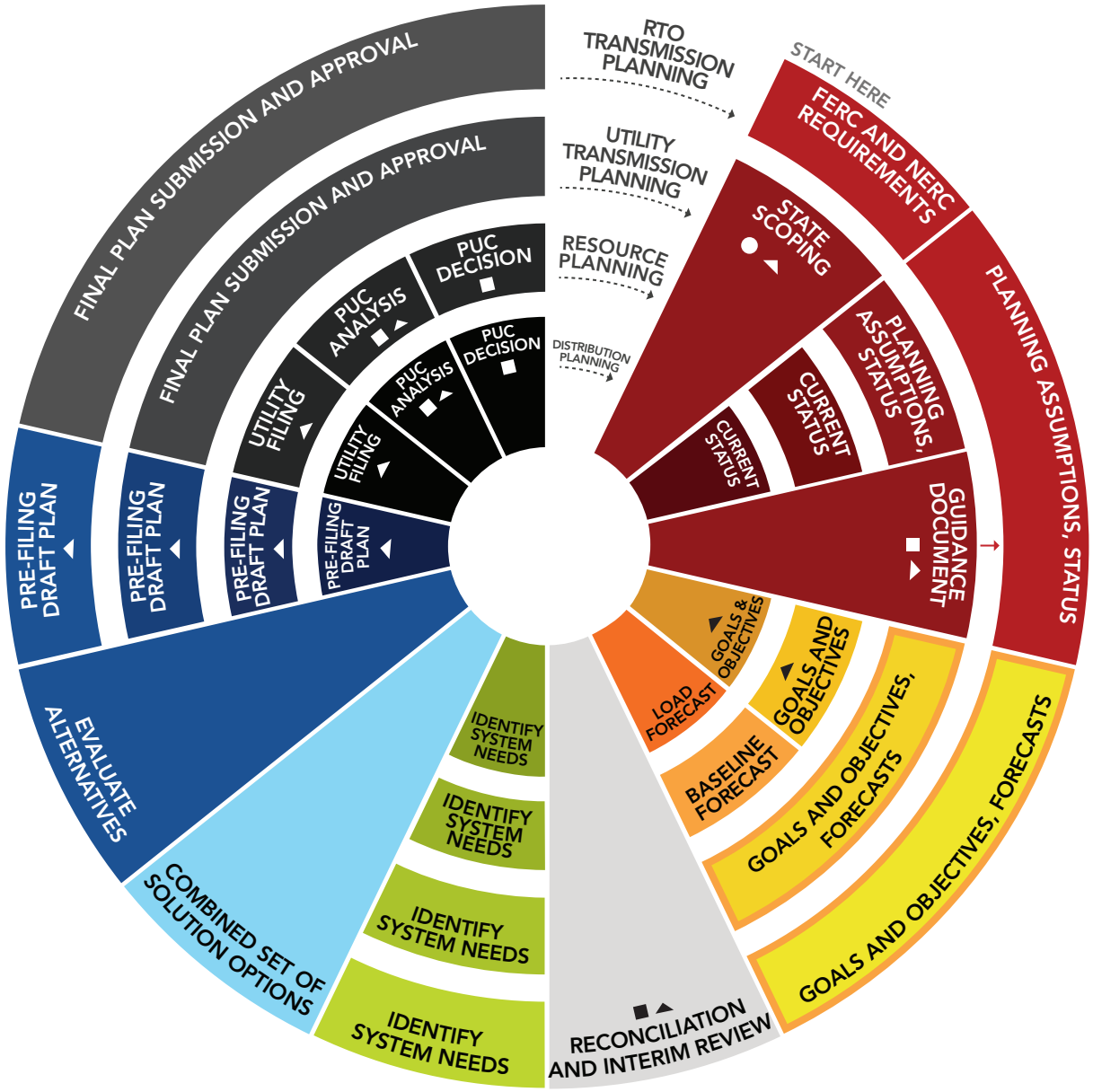
It is important to note that while the pre-filing draft plans in Phase 3 will include information regarding both the IRP and DSP processes, there may be separate final IRP and DSP plans that will be submitted for regulatory review. For TPP, there may be one plan for the utility's local reliability upgrades, and another plan by the RTO, or a combined TPP that incorporates all transmission system upgrades.



Existing Guidance, Resources, and Examples

- **Stakeholder engagement in integrated planning efforts**. Hawaiian Electric Company's Integrated Grid Planning. Stakeholder Engagement.
- **Stakeholder engagement on ISO Transmission Plan**. CAISO TPP. CAISO 2019–2020 Transmission Planning Process. Website.
- **Stakeholder presentation of DRAFT CAISO Transmission Plan**. Draft 2019–2020 Transmission Plan.
- **Developing action plans that incorporate stakeholder engagement**. Mid-Atlantic Distributed Resources Initiative. Integrated Distribution Planning for Electric Utilities: Guidance for Public Utility Commissions. October 2019. p. 42.

Vision Summary



This circular diagram is a representation of the Amber cohort's vision for aligned electricity planning, highlighting the vision and emphasizing the touchpoints and opportunities for greater alignment of electricity planning processes. The diagram serves two purposes: it is the executive summary of the cohort's roadmap and is designed in a way to facilitate comparison with other cohorts' visions.

To structure their roadmap, the cohort relied on eight foundational categories of planning, indicated by the color of each step. The sequence of the categories in this diagram is specific to the Amber cohort vision for aligned planning.

Planning Categories

- Establish Planning Assumptions
- Develop Forecasts
- Describe the Future Trajectory
- Identify System Needs
- Identify Solutions to Address Needs
- Evaluate and Apply Criteria to Determine Preferred Solutions
- Finalize Solutions, Approve and Publish Plan
- Integrated Process Steps

- State Policy Inputs to Planning
- State Regulatory Role in Planning
- Stakeholder Engagement

The Amber diagram shows four concentric rings that represent distribution, resource, and two types of transmission planning. Starting at the top and proceeding clockwise around the planning cycle, the wedges represent sequential steps. The Amber diagram includes five steps where wedges stretch across multiple rings. The cohort envisions an integrated approach to completing each of these steps:

- A state scoping step integrated across distribution, resource, and utility transmission planning
- Development of a guidance document that addresses distribution, resource, and utility transmission planning
- Reconciliation and interim review of goals, objectives, and forecasts across distribution, resource, utility transmission, and RTO transmission planning
- A combined set of solution options across distribution, resource, utility transmission, and RTO transmission planning
- Evaluation of alternatives across distribution, resource, utility transmission, and RTO transmission planning

Where the red arrow connects one step to another, the Amber cohort envisions information flowing from the guidance document for distribution, resource, and utility transmission planning to the RTO transmission planning step of establishing planning assumptions and status.

This roadmap document explains the Amber cohort vision in greater detail, expanding upon the vision summary diagram to include a flowchart of the entire integrated or aligned planning process, brief descriptions and explanations of each section of the flowchart, and points of evidence for innovative planning steps that appear in the vision.

NARUC-NASEO Task Force on Comprehensive Electricity Planning Resources Available

Through the Task Force on Comprehensive Electricity Planning, Task Force members, NARUC and NASEO staff, technical and subject matter experts, and others have developed a robust set of resources to support state decision makers in advancing aligned electricity system planning processes. Task Force materials are now available on the Task Force website: www.naruc.org/taskforce.

Task Force Resources

- Factsheet provides a synopsis of the Task Force goals, members, and resources.
- Blueprint for State Action supports states seeking to further align electricity system planning processes in ways that meet their own goals and objectives. The Blueprint provides a step-by-step approach for states to develop and implement a plan or series of actions to better align planning processes, based on the experience of Task Force member states.
- Task Force Cohort Roadmaps describe five distinct visions for an ideal comprehensive electricity planning process created by Task Force members. The process is viewed from the state perspective on how to align or integrate distinct planning processes that, historically, have not significantly informed one another. Each roadmap explains one vision for aligned planning, including both procedural and analytical steps, alongside points of evidence for innovative approaches that appear in the vision.
- Opportunities to Improve Analytical Capabilities towards Comprehensive Electricity System Planning outlines potential data, tools, and methods for conducting integrated analyses across key points in electricity planning processes that could help achieve the visions of the Task Force. This scoping study will be used to conduct a gap analysis and develop a research agenda for approaches and capabilities in areas such as load forecasting, solution evaluation, and system optimization within planning.
- Standard Building Blocks of Electricity System Planning Processes shares information about the color-coded framework cohorts used to describe their vision for aligned planning processes in consistent terms.
- Comprehensive Electricity Planning Library enables further learning about important issues related to comprehensive electricity planning by linking to existing publications and webinars. The library is organized across 15 key topical areas.
- Member State Summary Information includes a 2018 snapshot of each of the 15 member state's electricity system profile, organizational responsibilities, policy goals, and existing planning processes.

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About NARUC

NARUC is a non-profit organization founded in 1889 whose members include the governmental agencies that are engaged in the regulation of utilities and carriers in the fifty states, the District of Columbia, Puerto Rico and the Virgin Islands. NARUC's member agencies regulate telecommunications, energy, and water utilities. NARUC represents the interests of state public utility commissions before the three branches of the federal government. www.naruc.org.

About NASEO

NASEO is the only national non-profit association for the governor-designated State Energy Directors and the over 3,000 staff of their offices from each of the 56 states and territories. Formed by the states in 1986, NASEO facilitates peer learning among state energy officials, serves as a resource for and about state energy policy, and advocates the interests of the state energy offices to Congress and federal agencies. www.naseo.org.

NARUC-NASEO Task Force on Comprehensive Electricity Planning