NARUC-NASEO Task Force on Comprehensive Electricity Planning

National Council on Electricity Policy 2021 Annual Meeting

September 13, 2021

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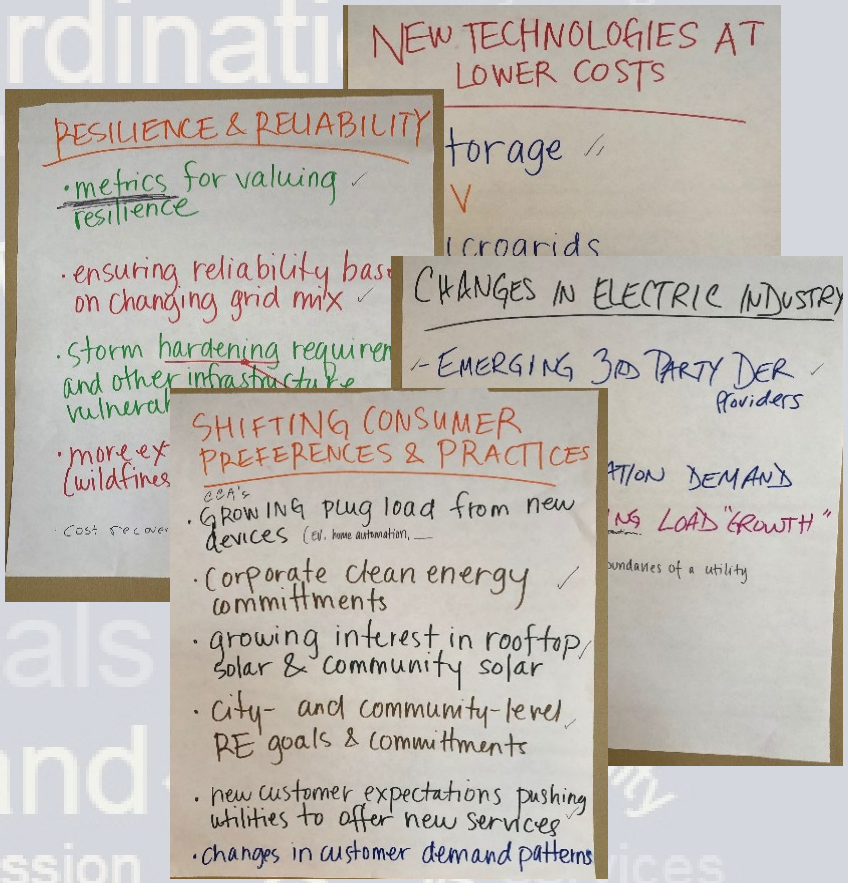
Outline

- Task Force participants and process – in brief
- Planning process building blocks
- Cohort roadmaps – five unique visions for aligned planning
- Resources
- Anticipated implementation challenges

Key Trends Driving Need for Change

- **Resilience and reliability**
- **Regulatory trends**
- **Coordination needs and benefits**
- **Policy/legislative interests**
- **Fuel price and other cost uncertainties**
- **Shifting consumer preferences / practices**
- **Changes in electric industry**
- **New technologies at lower costs**



15 States & Territories Participated

Arizona

Arkansas

California
(co-vice chair)

Colorado
(co-chair)

Hawaii

Indiana
(co-chair)

Maryland

Michigan

Minnesota

North Carolina

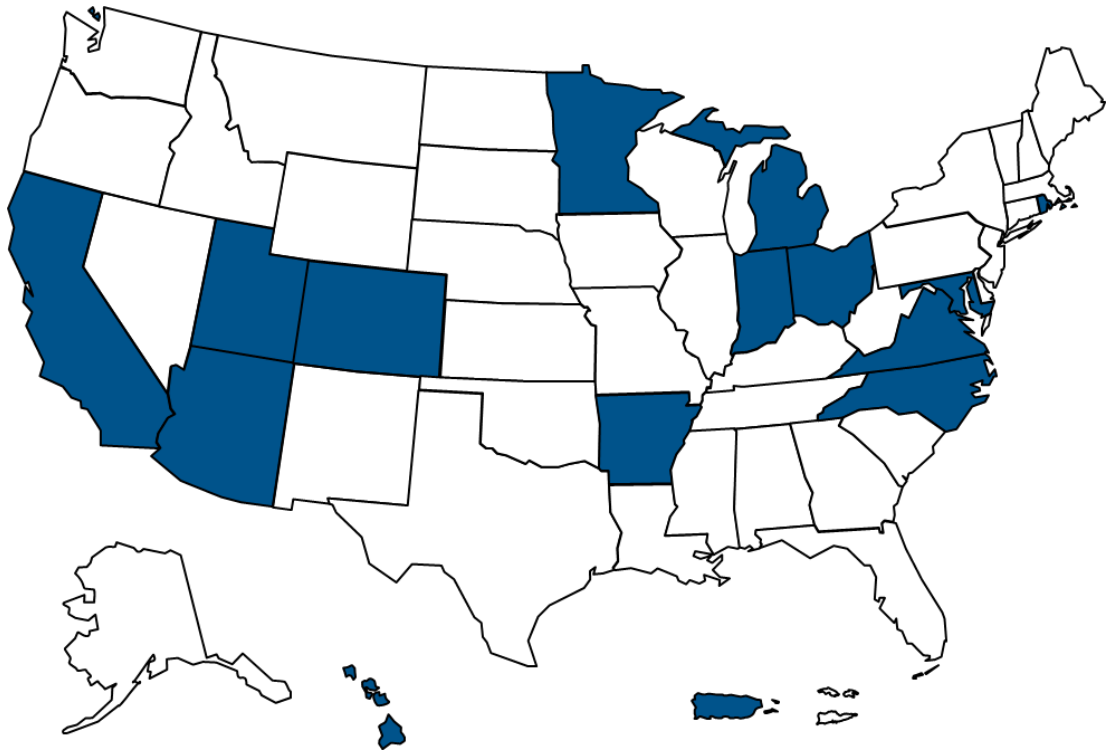
Ohio
(co-vice chair)

Puerto Rico

Rhode Island

Utah

Virginia



Diverse:

- Geography
- Market models (e.g., retail competition, wholesale market)
- Planning approaches (e.g., state energy office roles, distribution system planning)
- State goals (e.g., grid mod, resilience, climate, clean energy, economic development)

Highly Collaborative Two-Year Process

Feb 2019 – Feb 2021
4 workshops

Identify key trends, form cohorts, articulate guiding principles, map status quo planning, begin identifying alignment needs

April 2019

Refine opportunities for planning process alignment with support from stakeholders and subject matter experts

"Process Maps"

October 2019

Consider what it takes to operationalize idealized aligned planning processes with utility planners

"Roadmaps"

September 2020

Support state action planning to build on the work of the Task Force

November 2020

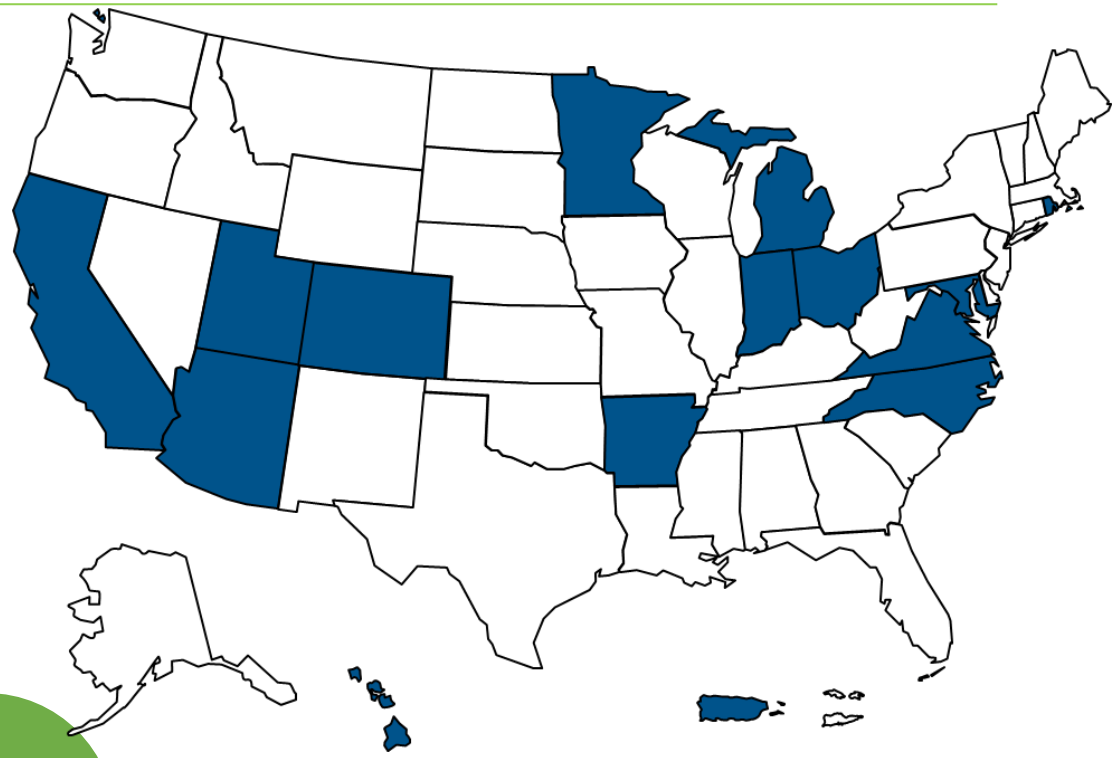
States Are Taking Action Steps

Arizona, California, Hawaii, North Carolina, Puerto Rico

More holistic analysis of distribution & resource needs & possible solutions

California, Colorado, Hawaii, Michigan, Minnesota, North Carolina, Rhode Island, Virginia

Align planning with state priorities (e.g., resilience, decarbonization, RE targets)



Arkansas, California, Hawaii, Minnesota, Puerto Rico, Rhode Island

Expand availability of data for distribution planning

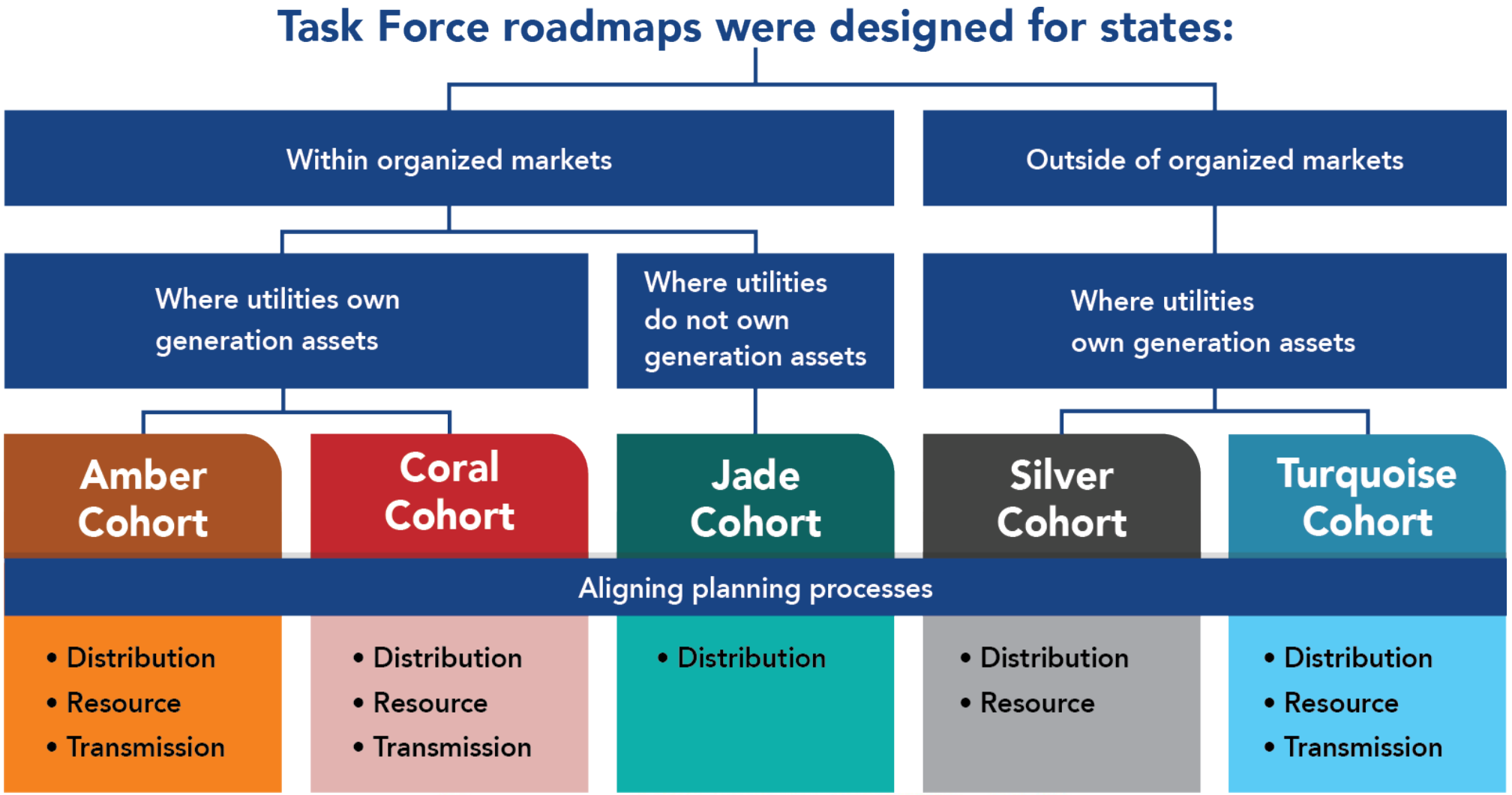
Hawaii, Maryland, Minnesota, North Carolina

Technical conferences / briefings on Task Force to support state road-mapping

Arizona, Hawaii, Maryland

Create or expand dedicated forums for stakeholder input into planning

Teams of 3 States Each Developed Visions & Roadmaps



Source: NARUC-NASEO Task Force Blueprint for State Action

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Standard Building Blocks of Electricity System Planning Processes

Source: Aligning Integrated Resource Planning and Distribution Planning—Standard Building Blocks of Electricity Planning Processes

Visions for Aligned Planning

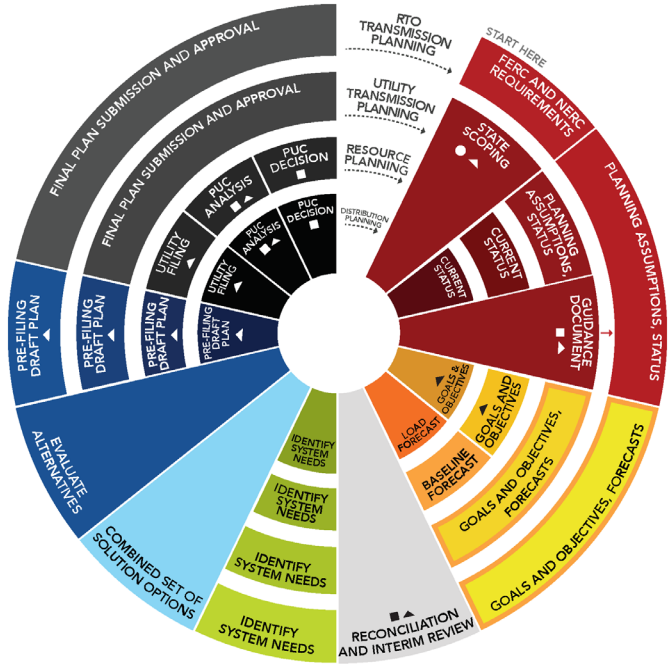
- State policy inputs to planning
- State regulatory role in planning
- Stakeholder engagement

Color Key

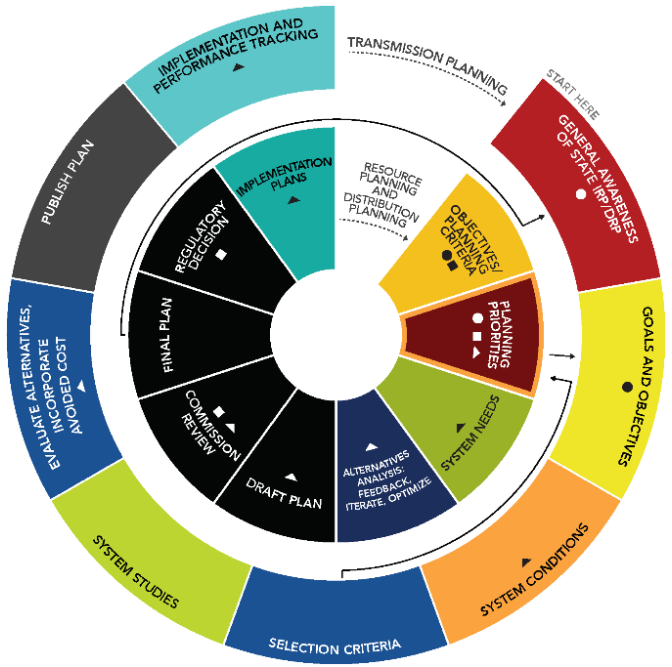
Planning Categories

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

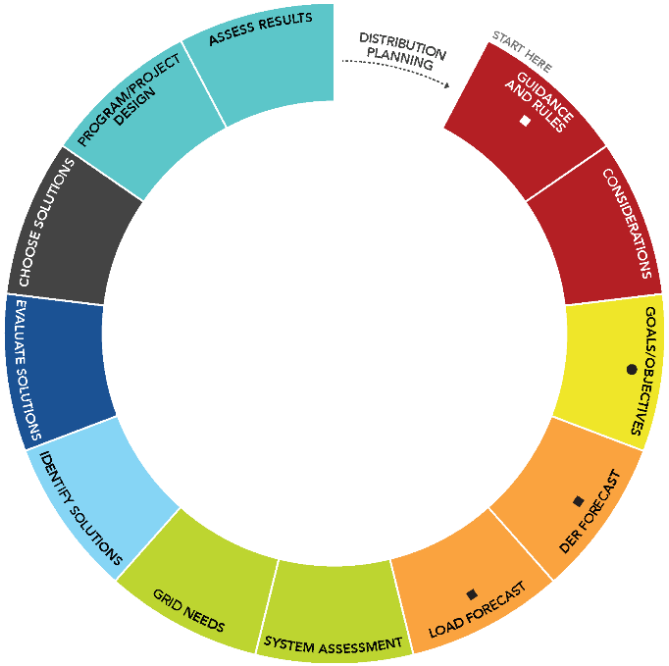
AMBER



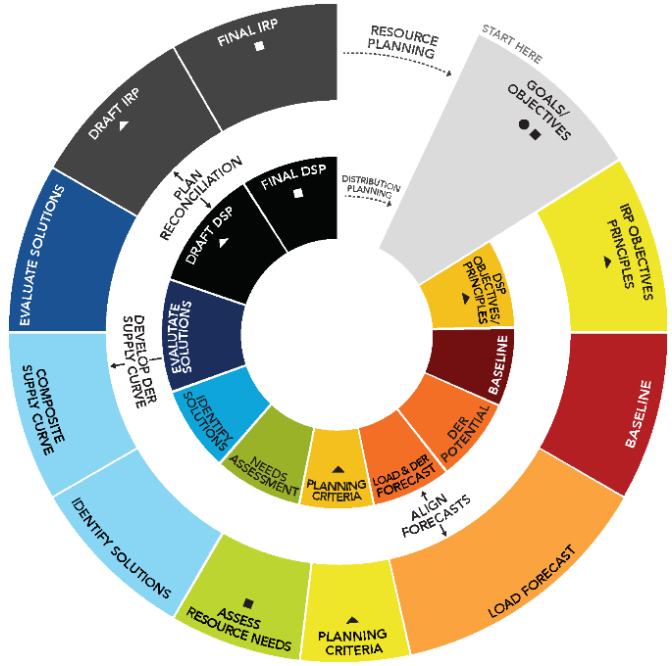
CORAL



JADE



SILVER



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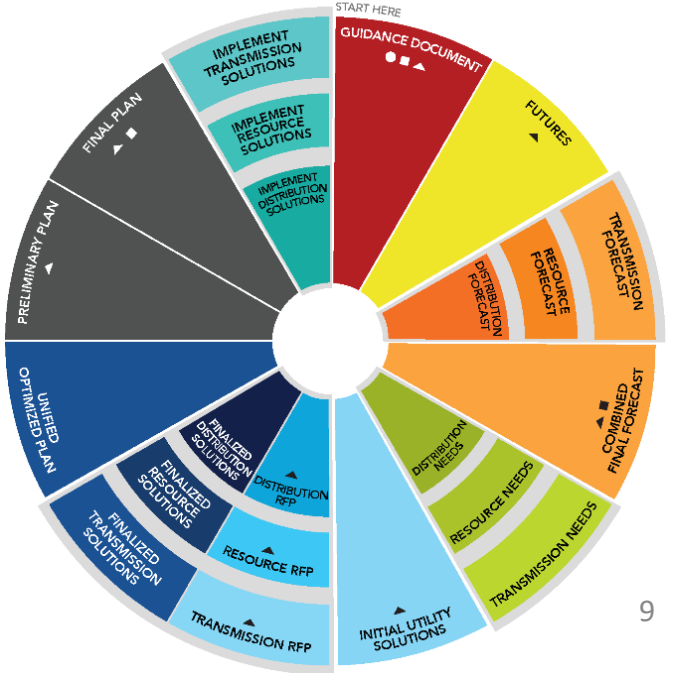
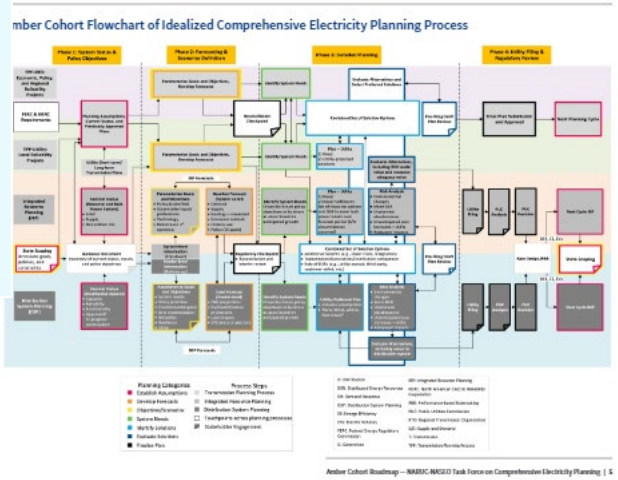


Roadmap Example

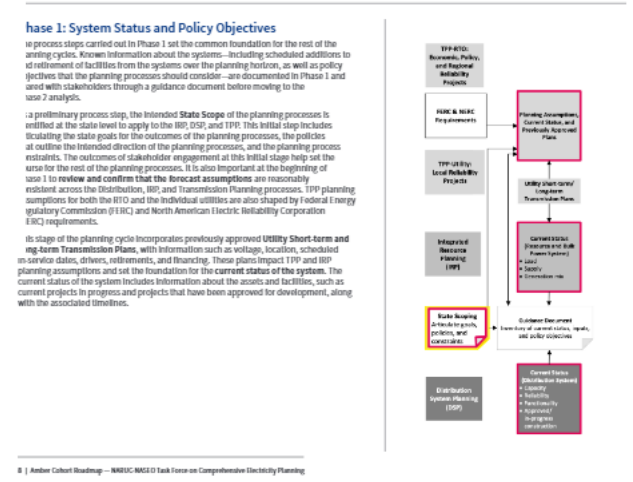


Guidance, resources, and examples are accompanied by this symbol:

Color Key

Planning Categories

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



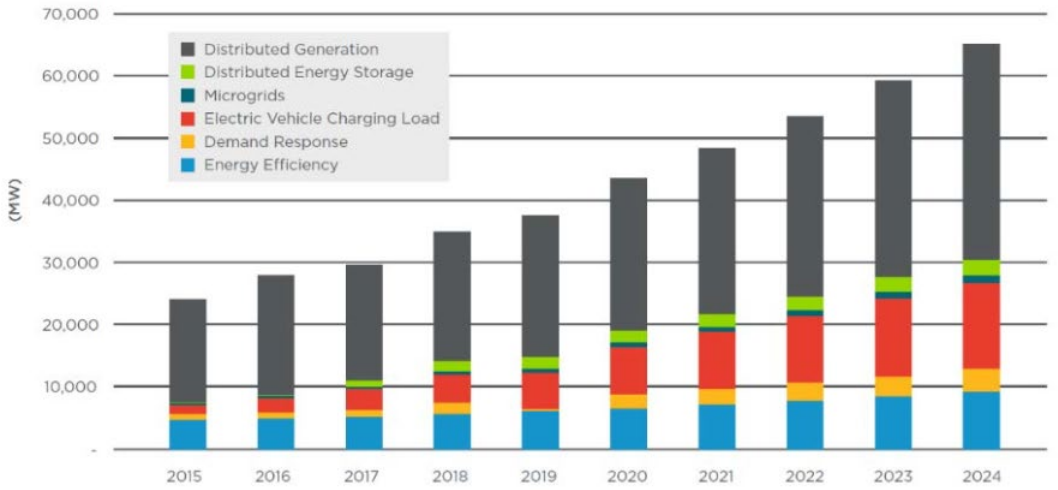
Amber Cohort – Profile

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

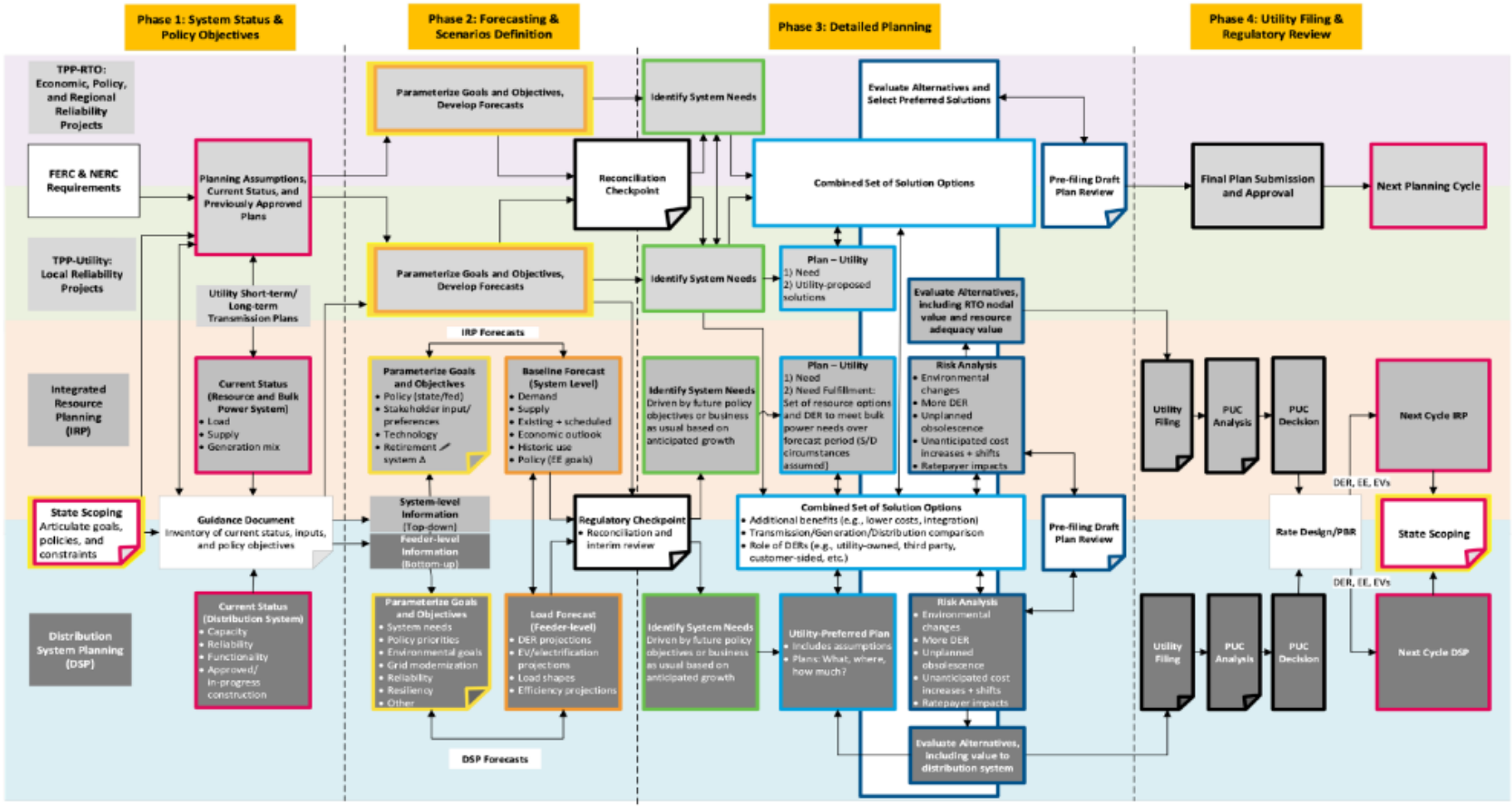
Figure 2 – U.S. Annual Installed DER Power Capacity Additions by DER Technology, 2015-2024



https://www.ferc.gov/sites/default/files/2020-05/der-report_0.pdf

Amber Flowchart

Amber Cohort Flowchart of Idealized Comprehensive Electricity Planning Process



Acronyms

D: Distribution	EE: Energy Efficiency
DER: Distributed Energy Resources	ESS: Energy Storage Systems
DHS: Department of Homeland Security	EVs: Electric Vehicles
DR: Demand Response	IRP: Integrated Resource Planning
DSP: Distribution System Planning	MW: Megawatts
	PV: Photovoltaics

Key

Planning Categories	Process Steps
Establish Assumptions	Distribution System Planning (DSP)
Develop Forecasts	Integrated Resource Planning (IRP)
Objectives/Scenarios	Touchpoints Across Planning Processes
System Needs	Stakeholder Engagement
Identify Solutions	
Evaluate Solutions	
Finalize Plan	
Implement	

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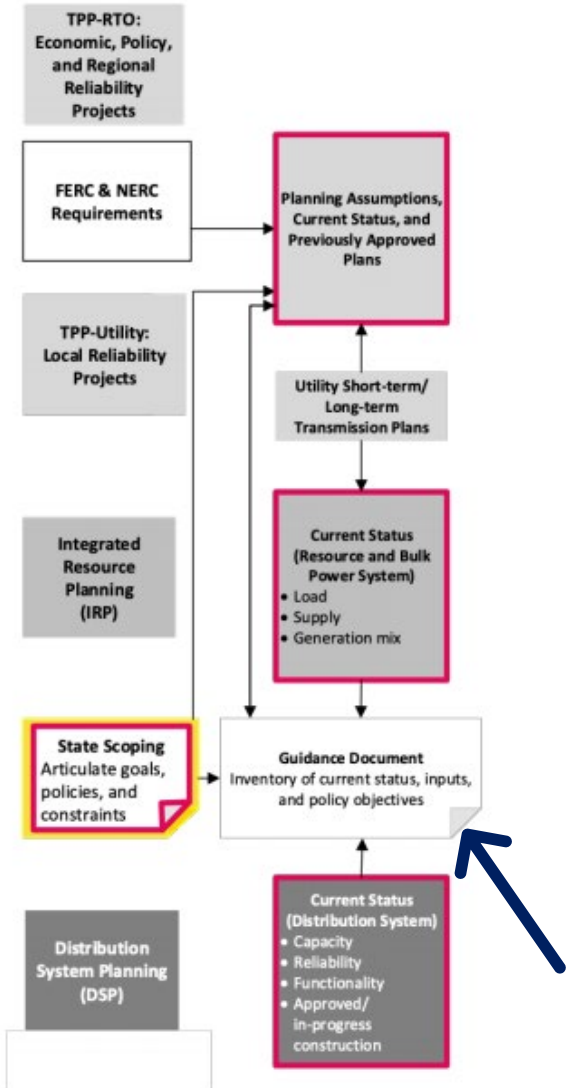
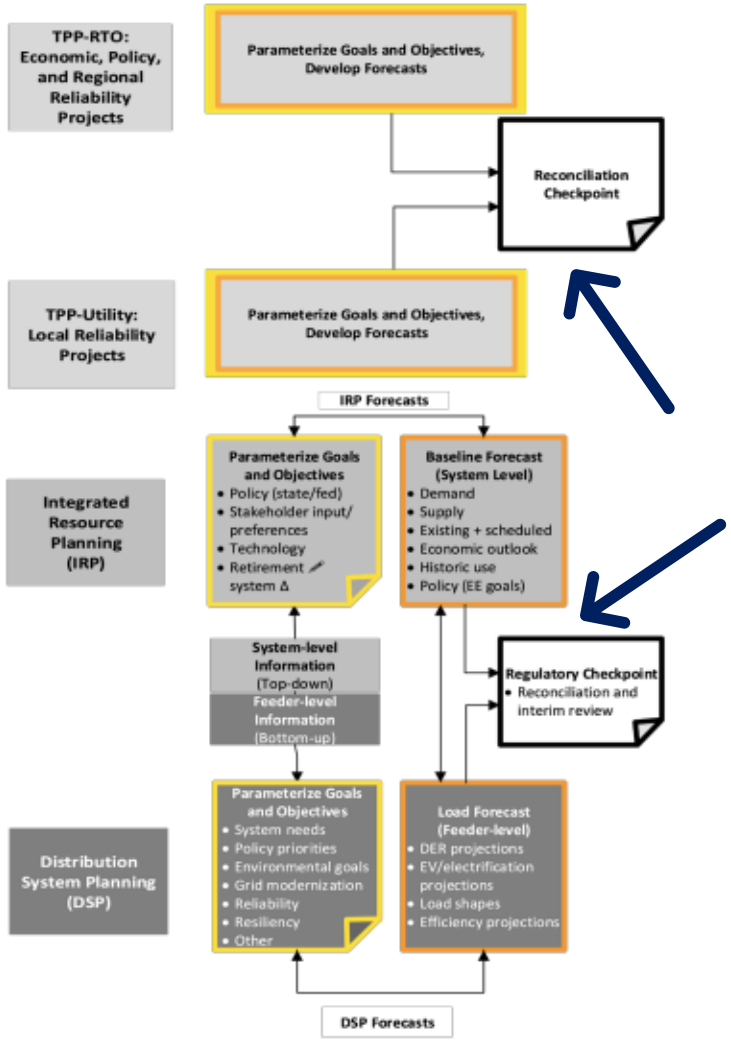
Amber Cohort Innovations

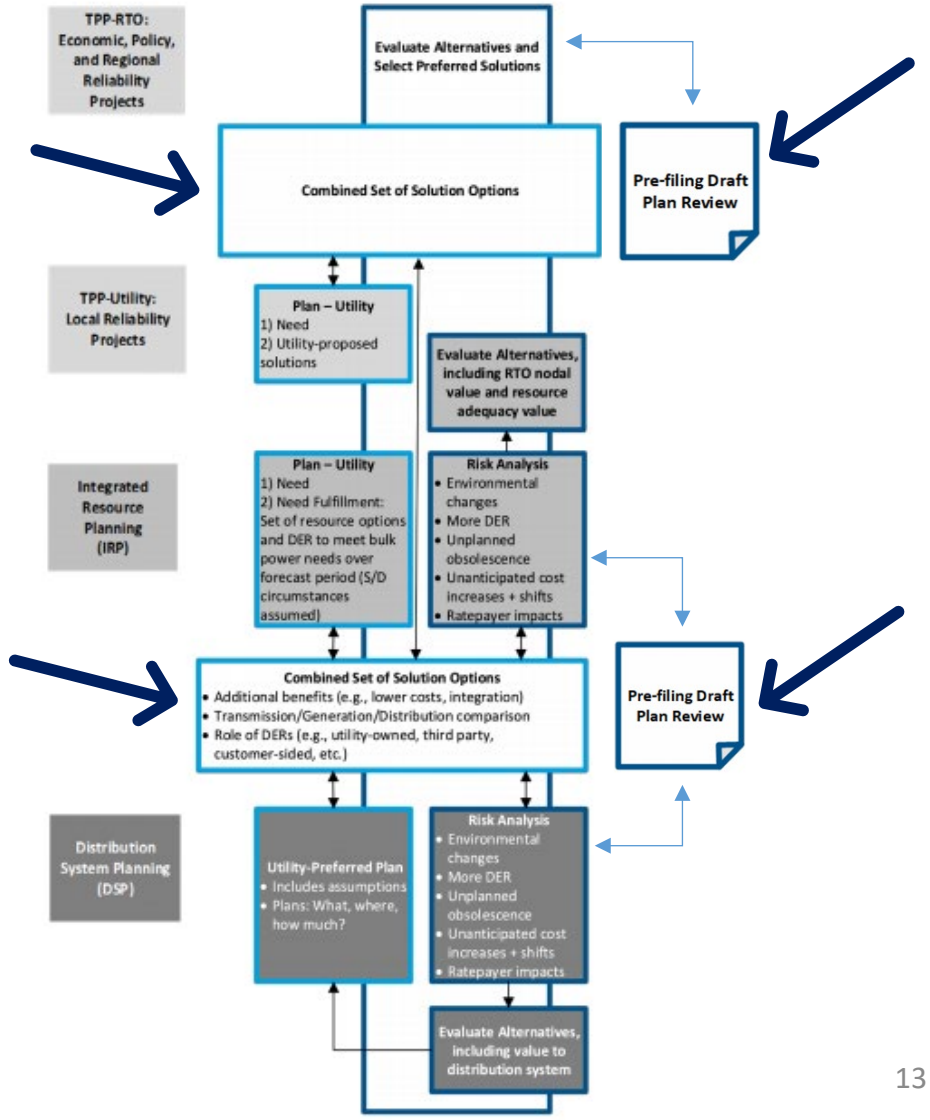
Phase 1: System Status and Policy Objectives



Phase 2: Forecasting and Scenario Definitions



Phase 3: Detailed Planning



Coral Cohort – Profile

About Coral: A Fictional, Representative State

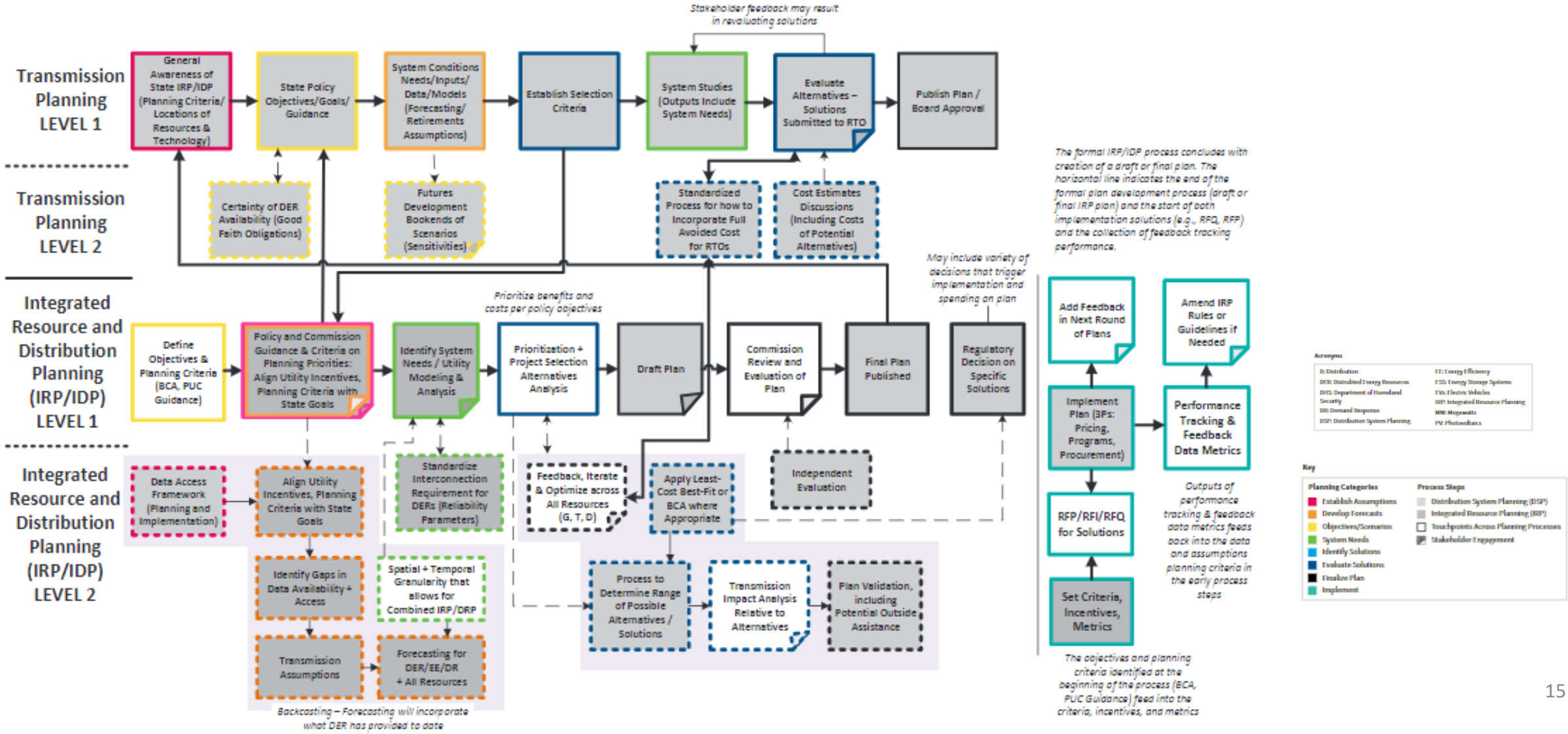
Structure	
Regulatory	**Our state's investor-owned utilities** are vertically integrated and own generation assets
Market	**Our state is located** within an RTO/ISO market
Planning Processes	**Our state is seeking to align** distribution, resource, and transmission planning processes

Additional Characteristics		
A few other characteristics you should know	• We are pragmatic, but take calculated risks • We are collaborative across our region • We are in two RTOs with ability to benefit from their experts and resources	
We are doing this because we want to accomplish	• Affordability/cost effectiveness • Core regulatory requirements • Leadership guided by public interest • Visibility into system needs • Holistic view of alternatives	• Continuous improvements • Adaptive to technology change • Risk mitigation • Access to data
While keeping in mind	• Market dynamics • Limitations on regulatory authority	• Potential for a theoretical federal policy • Improvements of planning and modeling tools
And trying to be responsive to	• Market developments and technology change • Customer engagement/customer preferences	• Political realities • Concerns over cost shifting • Concerns over evolving utility role

https://www.ferc.gov/electric-power-markets

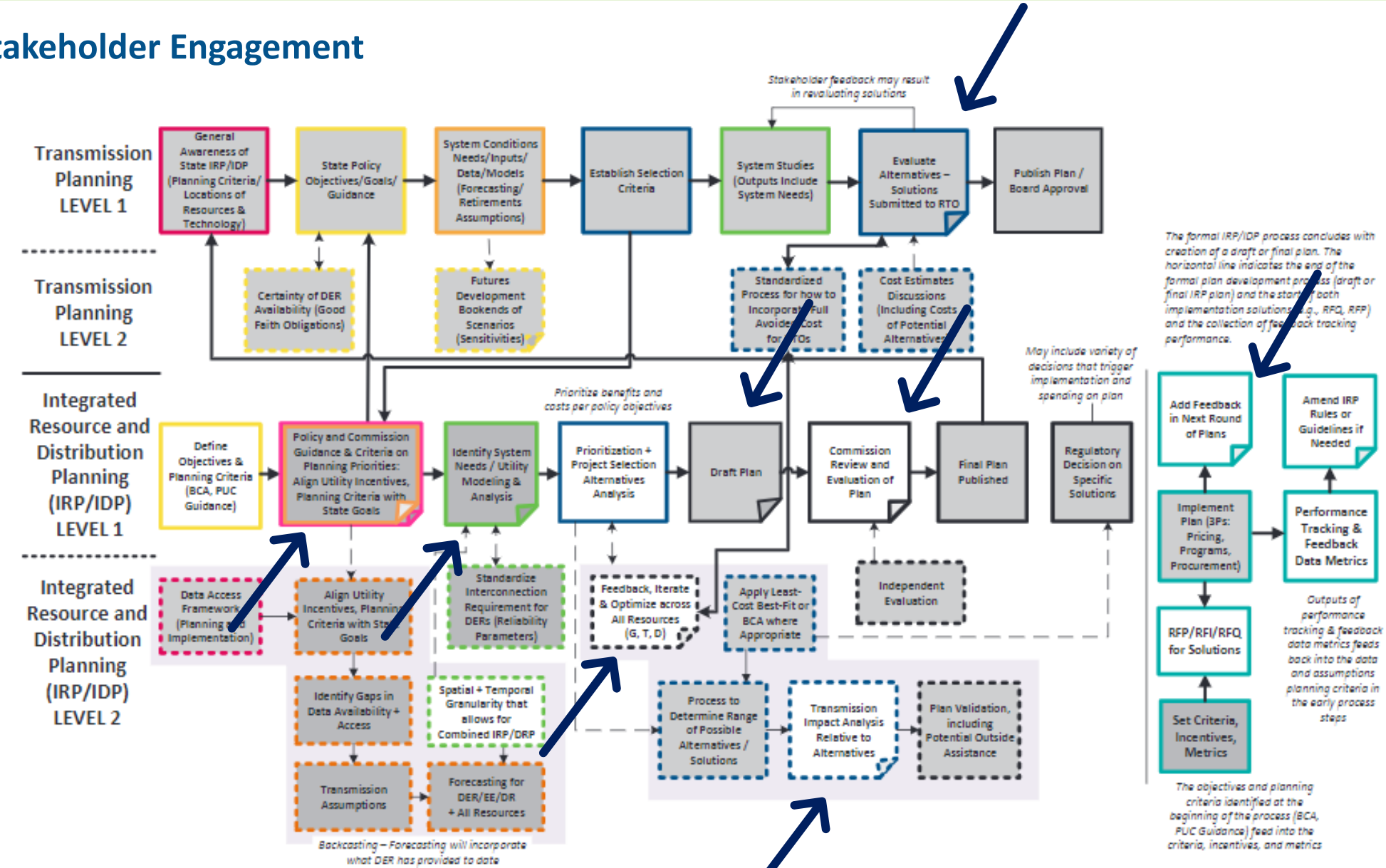
Coral Flowchart

Coral Cohort Flowchart of Idealized Comprehensive Electricity Planning Process



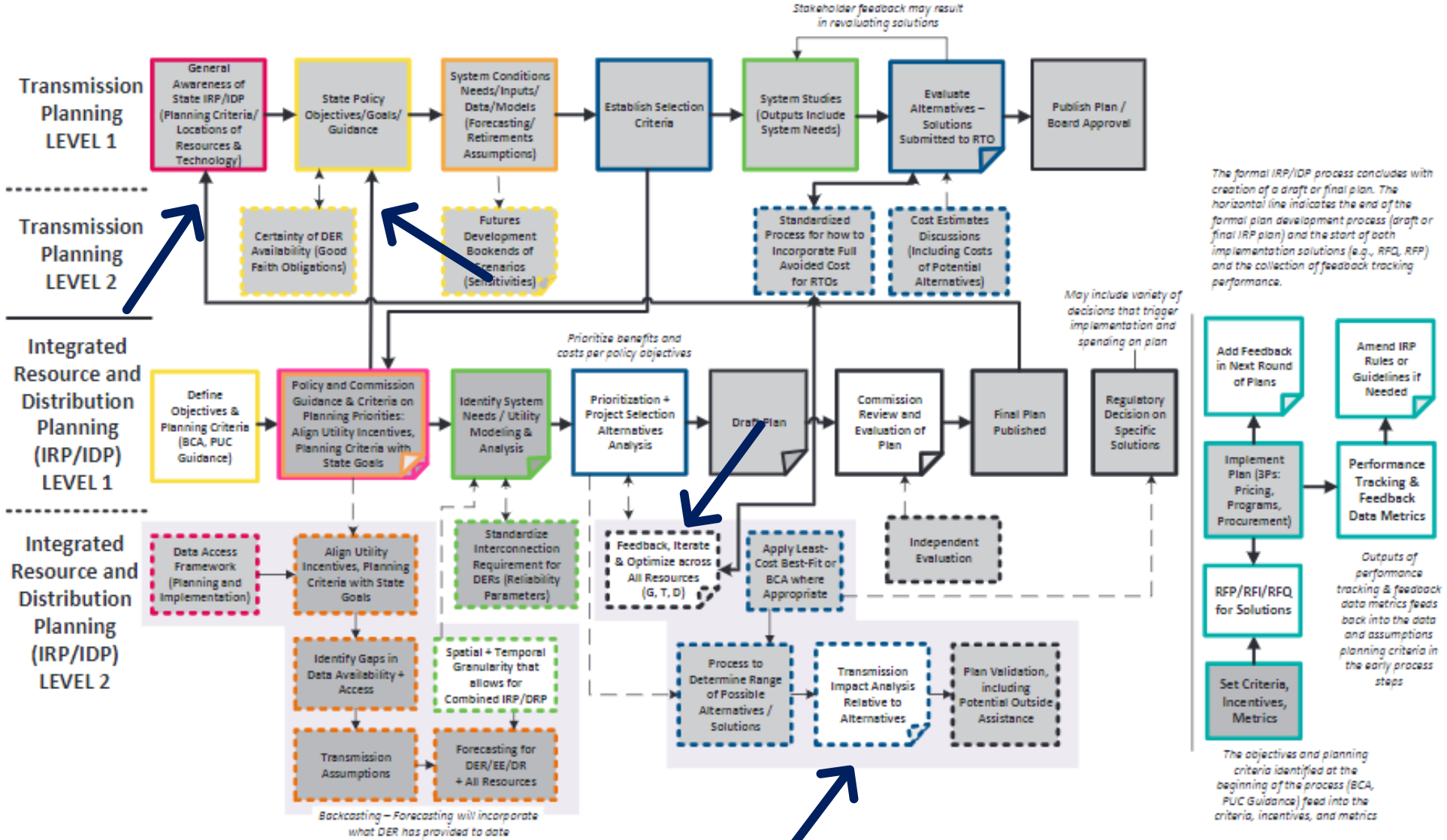
Coral Cohort Innovations

Stakeholder Engagement



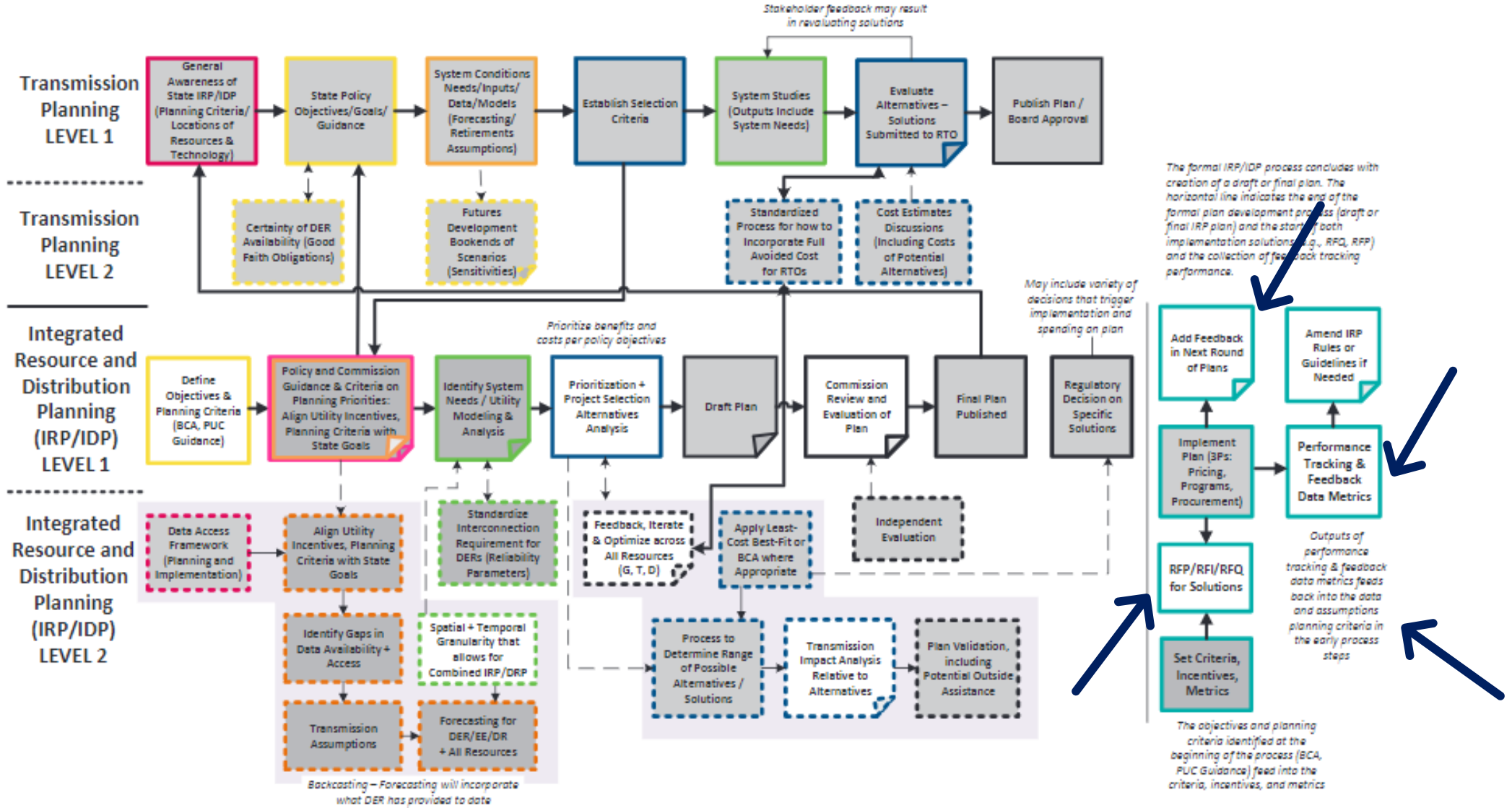
Coral Cohort Innovations

Linkages between IRP/IDP and transmission plans

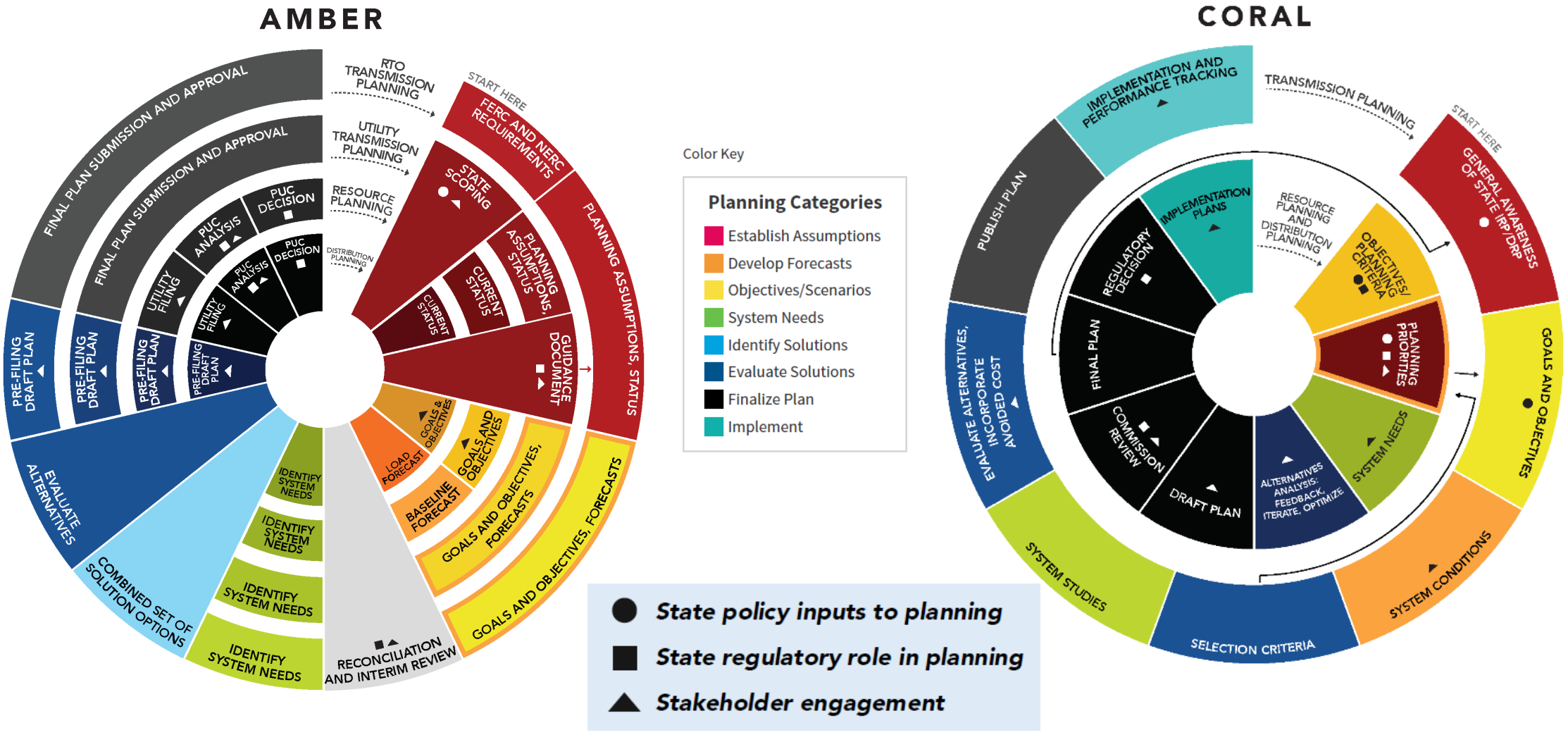


Coral Cohort Innovations

Feedback Loops



Summary of Two Different Vision Options



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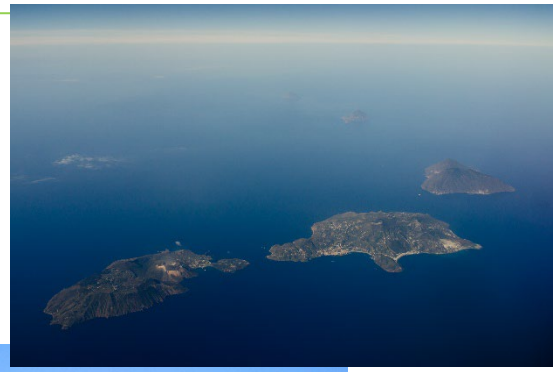
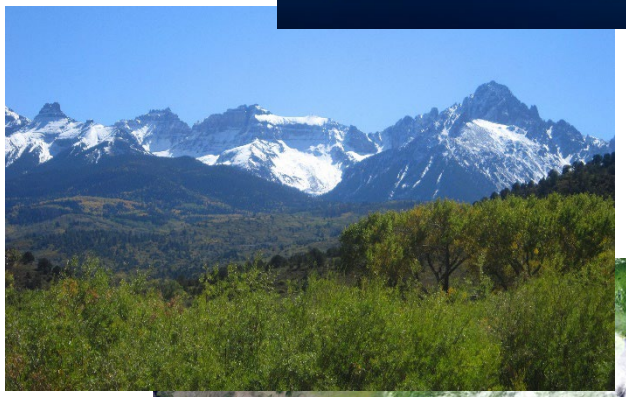
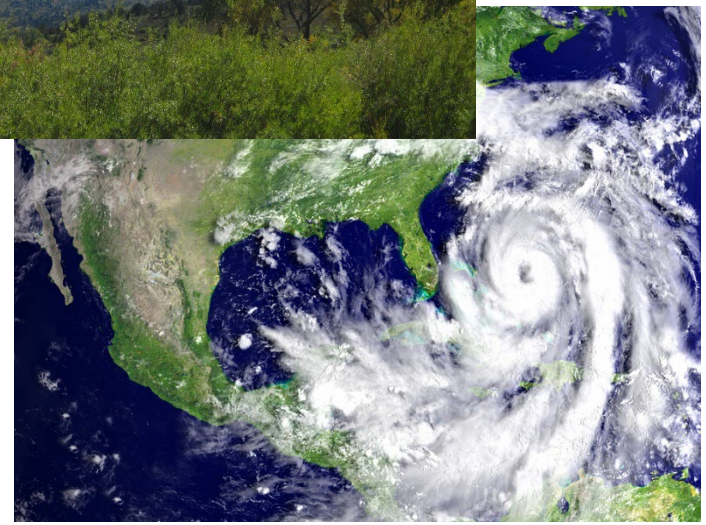
Silver Cohort – Profile

About Silver: A Fictional, Representative State

Structure	
Regulatory	**Our state's investor-owned utilities** own generation assets
Market	**Our state is located** outside of an RTO/ISO market
Planning Processes	**Our state is seeking to align** distribution and resource planning processes
Additional Characteristics	
A few other characteristics you should know	• We have unique geography and are vulnerable to particular weather events and natural disasters • There is no retail competition • We have flat or declining load
We are doing this because we want to accomplish	• Achieving a functional, comprehensive planning process that integrates all of the components of the electricity system
While keeping in mind	• Environmental needs • Technical requirements • Affordability
And trying to be responsive to	• New customer needs and the capability of integrating new technology

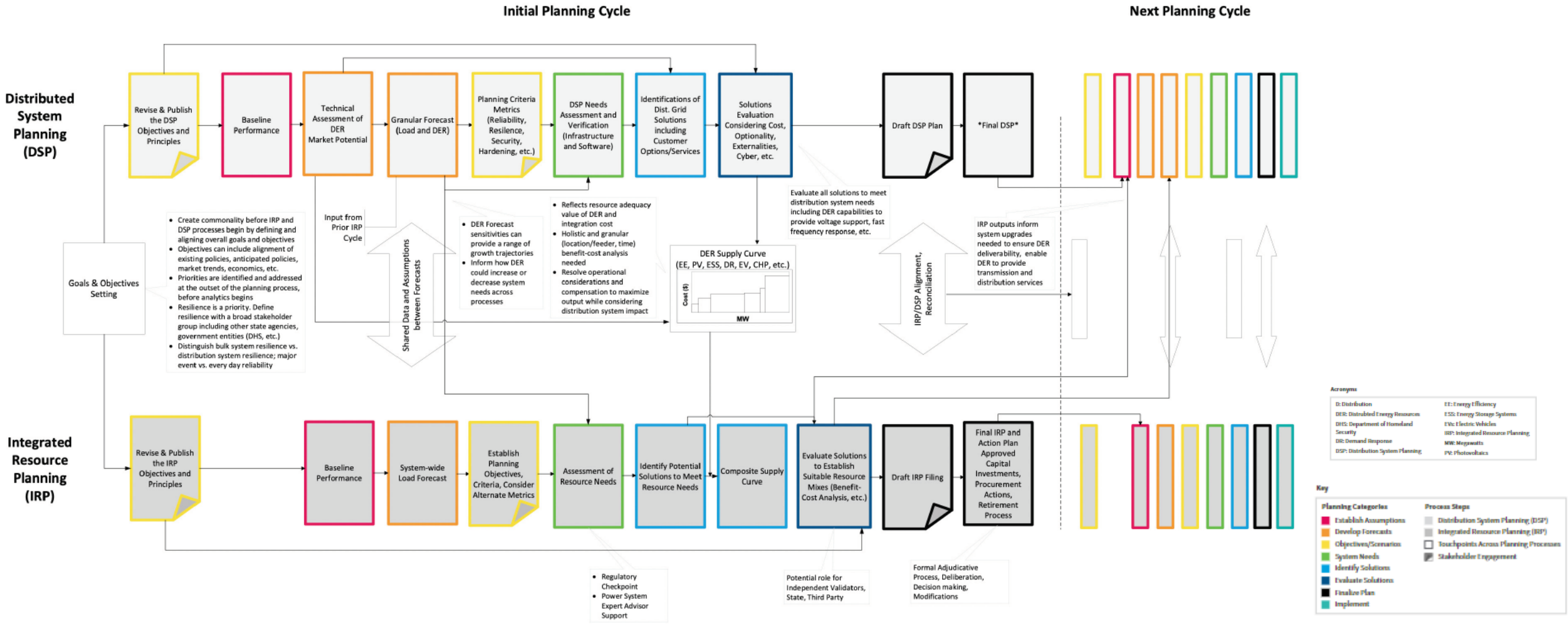






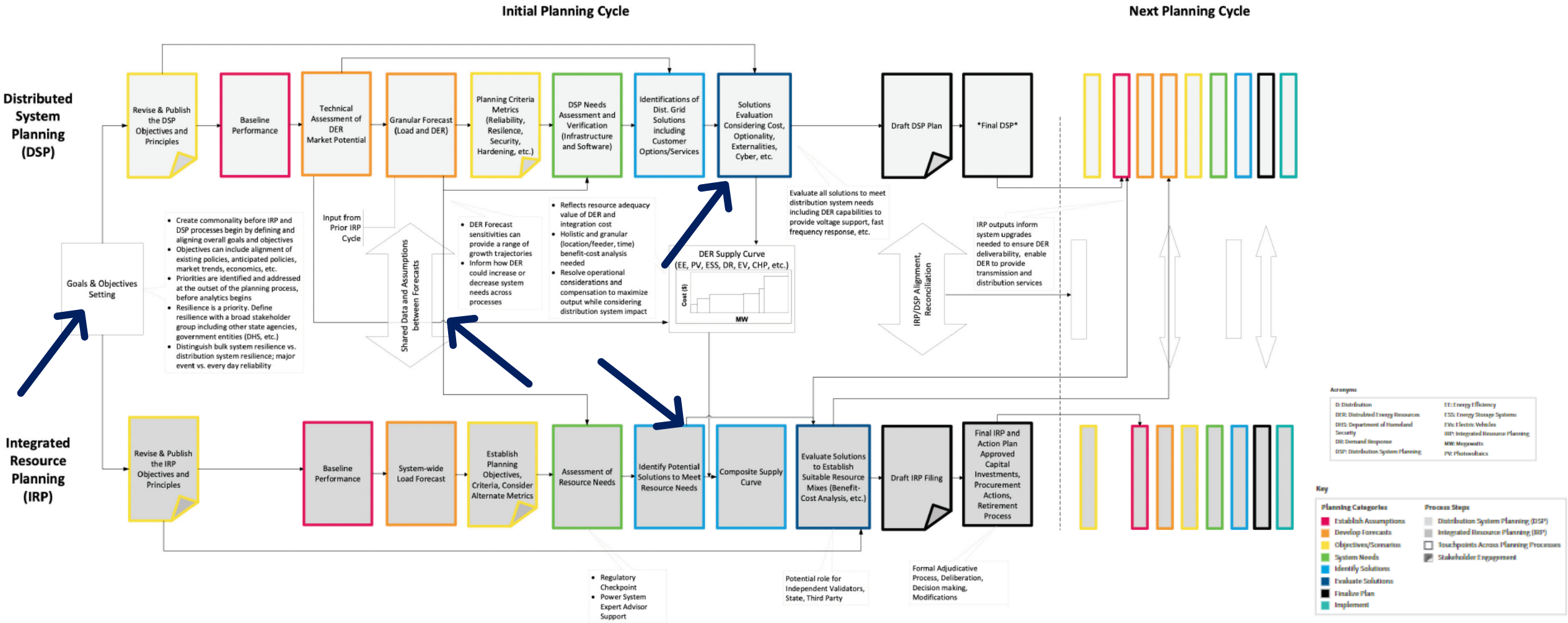
Silver Flowchart

Silver Cohort Flowchart of Idealized Comprehensive Electricity Planning Process



Silver Cohort Innovations

Silver Cohort Flowchart of Idealized Comprehensive Electricity Planning Process



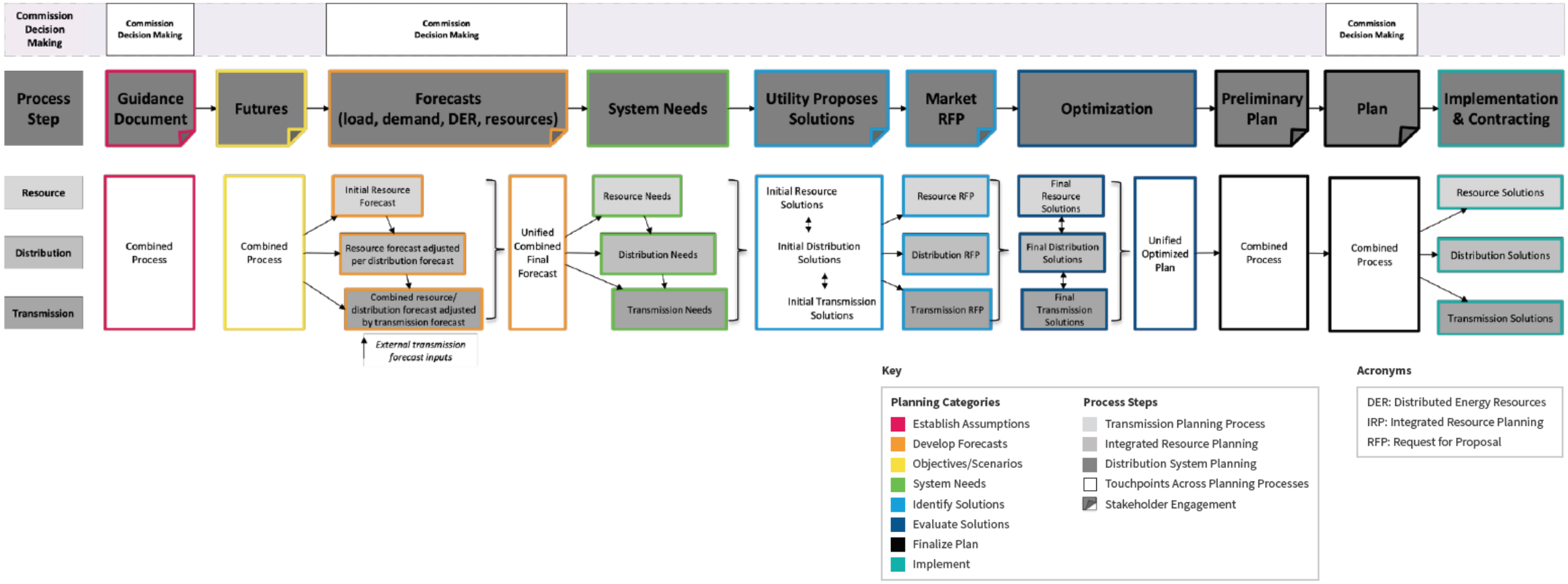
Turquoise Cohort – Profile

About Turquoise: A Fictional, Representative State

Structure	
Regulatory	**Our state's investor-owned utilities** own generation assets
Market	**Our state is located** outside of 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	• Competing energy policies • Large amounts of space between load centers, which requires a unique approach to transmission planning
We are doing this because we want to accomplish	• Pathways for innovation and customer options that preserve the robustness of system planning & fairness of cost causation and allocation • A holistic planning approach that focuses on maintaining a flexible system that can respond to a changing generation mix • Transparency of planning processes • Pathways for allowing DERs the opportunity to compete fairly in the system planning process and provide cost-effective outcomes
While keeping in mind	• Preserving the value proposition of the utility-driven system (reliability, affordability, security)
And trying to be responsive to	• Promoting data-driven results that are verifiable

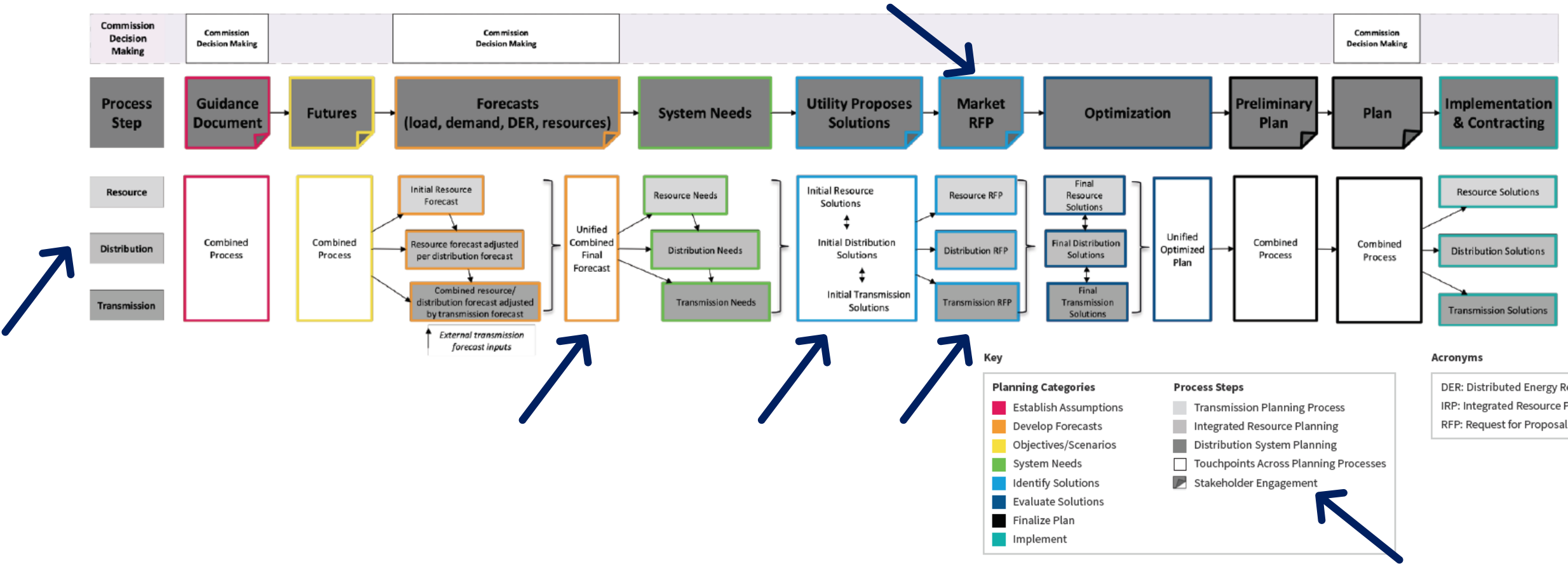
Turquoise Flowchart

Turquoise Cohort Flowchart of Idealized Comprehensive Electricity Planning Process



Turquoise Flowchart

Turquoise Cohort Flowchart of Idealized Comprehensive Electricity Planning Process



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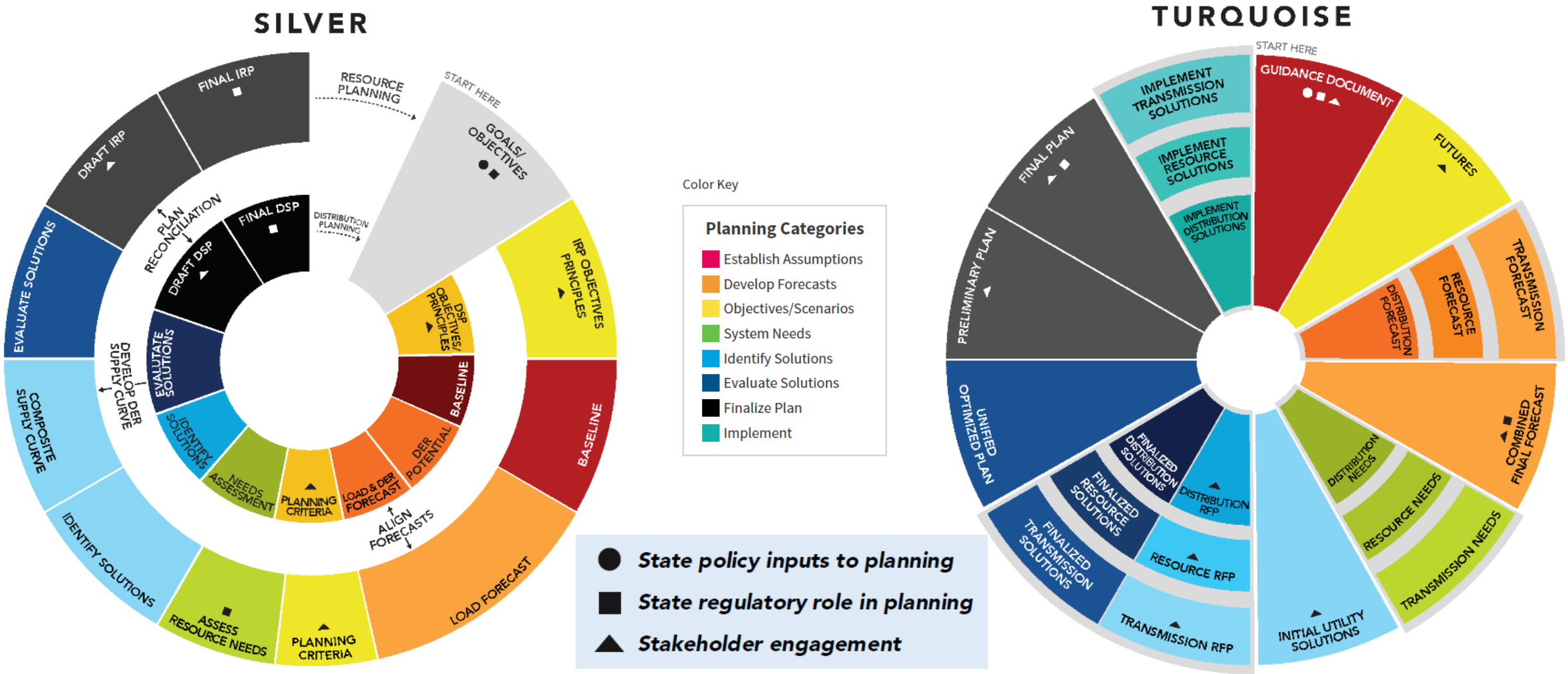
Summary of Two Different Vision Options



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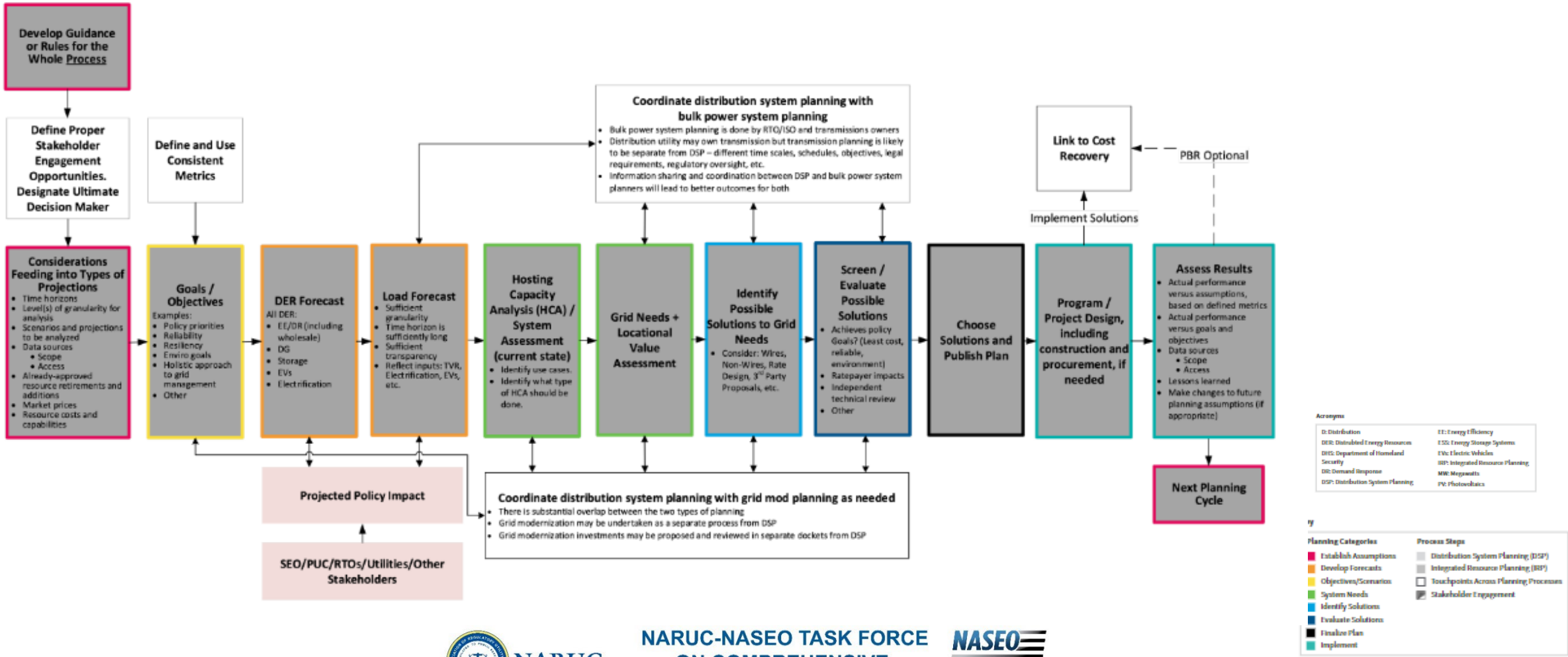
Jade Cohort – Profile

About Jade: A Fictional, Representative State

Structure	
Regulatory	**Our state's investor-owned utilities** do not own generation assets
Market	**Our state is located** within an RTO/ISO market
Planning Processes	**Our state is seeking to align** distribution planning processes
Additional Characteristics	
A few other characteristics you should know	• We have retail competition • The policy path in our state could be volatile/may not be locked in • Cold and ice can be high-impact resilience events
We are doing this because we want to	• Optimize utility investments and the integration of customer and third-party resources to achieve cost efficiency • Enhance operations and maintenance through increased visibility into the system and better utilization of data analytics • Increase transparency around distribution system planning, including capital investment strategy
While keeping in mind	• Generation assets and connections to G & T • Availability of resource and transmission assets, storage, and combinations of resources • Rate structures and beneficial values • Regulatory jurisdiction lines can be blurry between transmission and distribution • Effects of plans others make for transmission and generation
And trying to be responsive to	• State policy • Stakeholder interests

Jade Flowchart

Jade Cohort Flowchart of Idealized Comprehensive Electricity Planning Process



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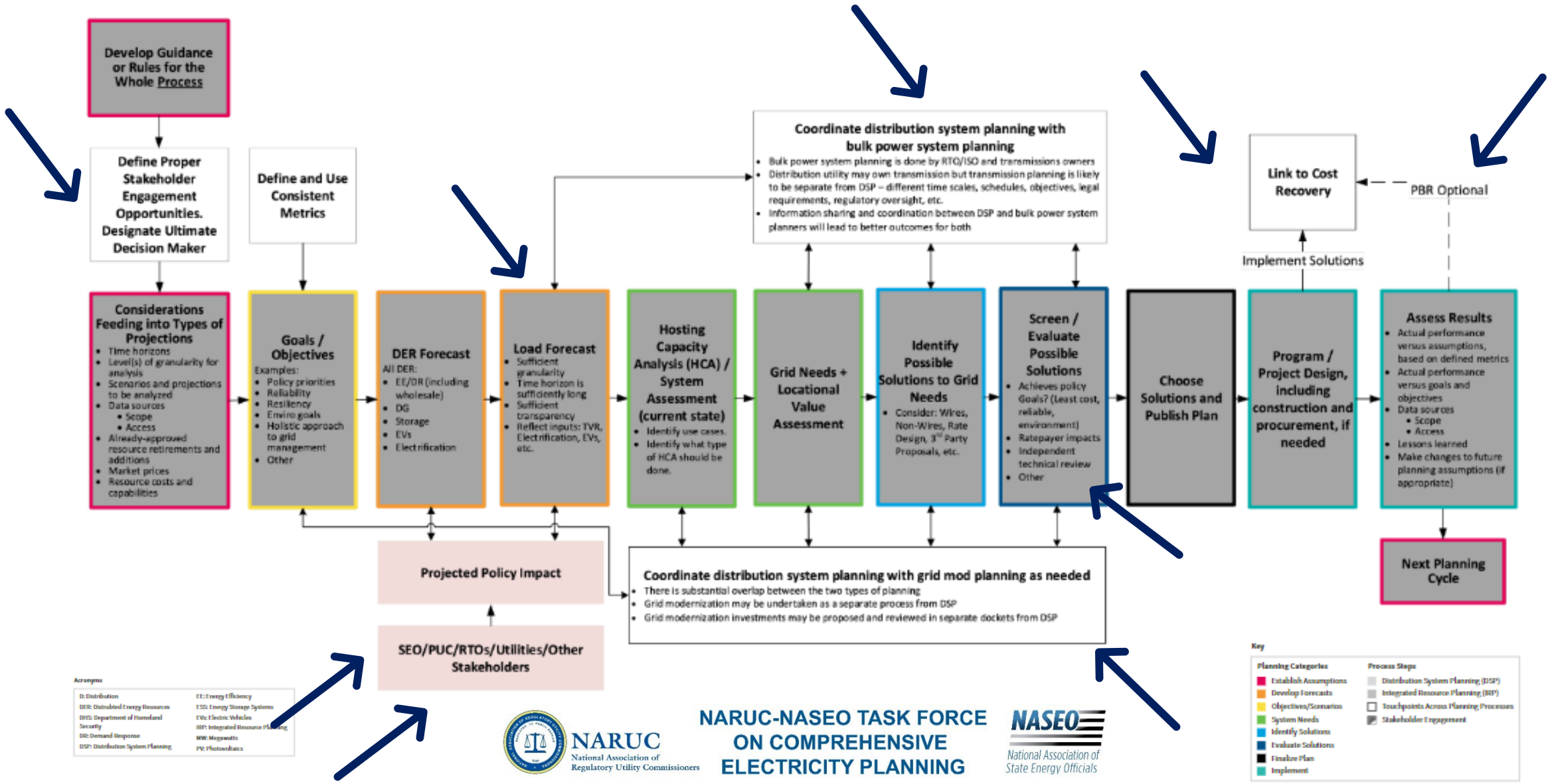
Jade Innovations



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Interpreting Vision Diagrams

Color Key

Planning Categories

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

- ● ***State policy inputs to planning***
- ■ ***State regulatory role in planning***
- ▲ ***Stakeholder engagement***

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Roadmap Questions?

- State policy inputs to planning
- State regulatory role in planning
- Stakeholder engagement

Color Key

Planning Categories

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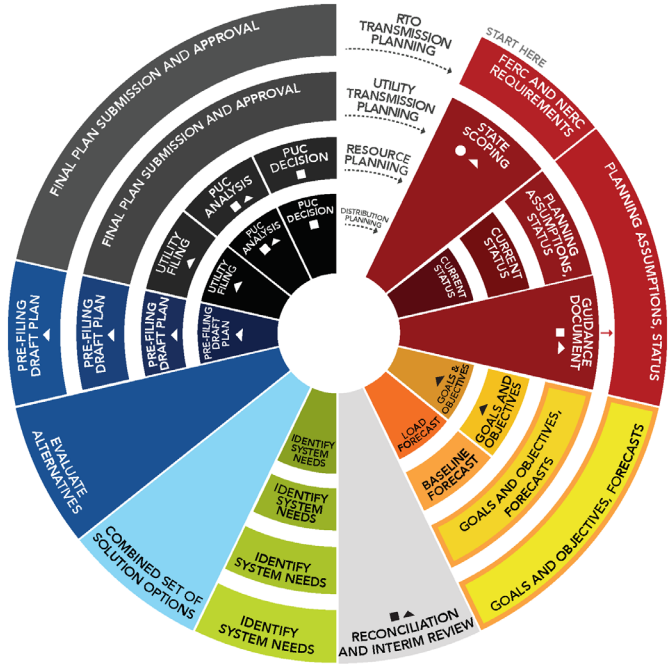
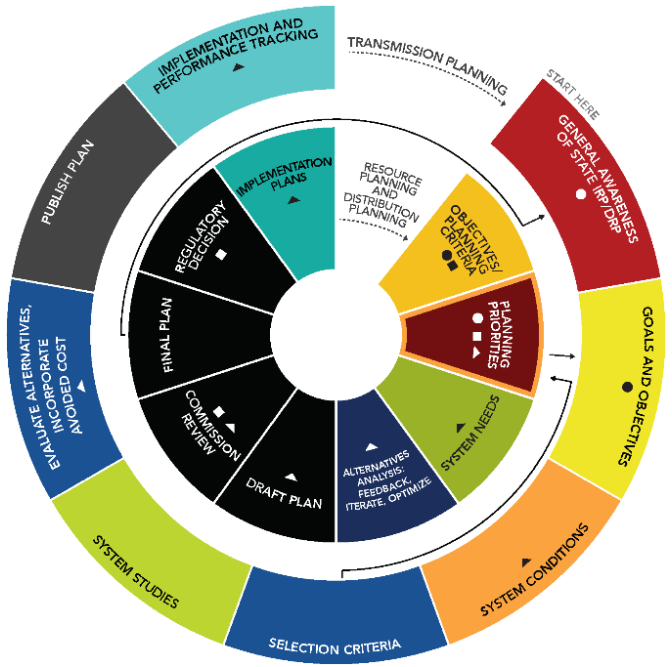
AMBER



CORAL



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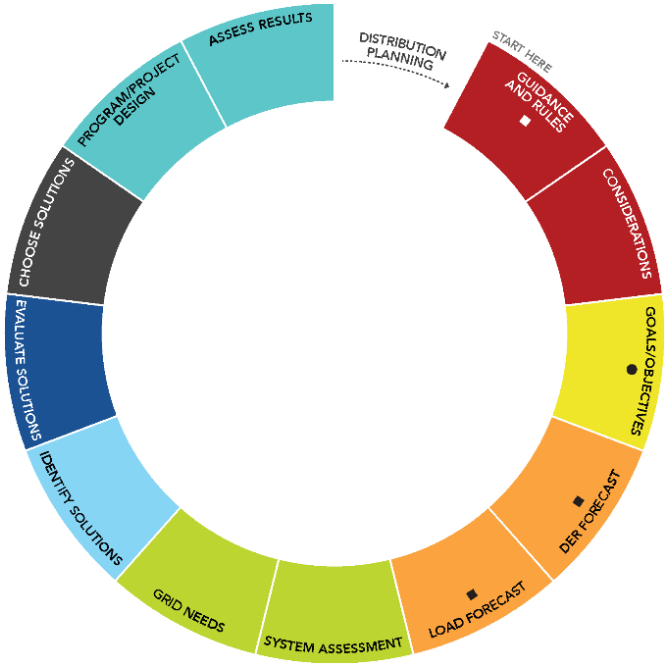
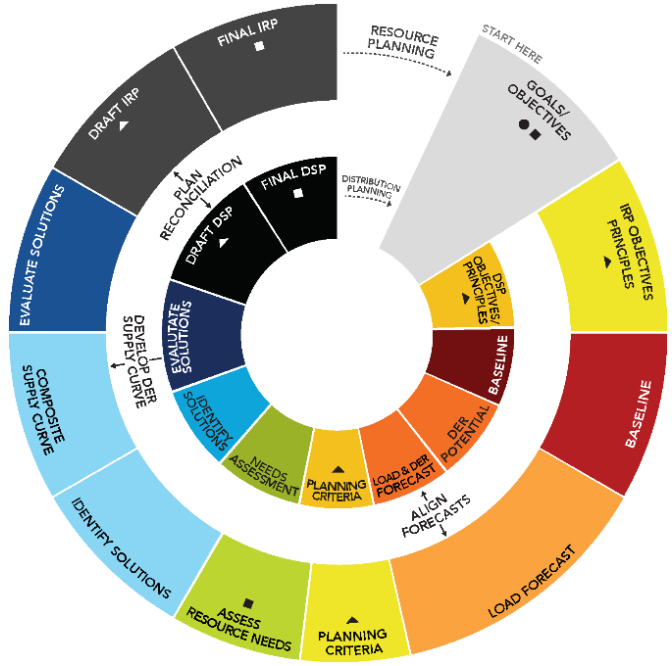
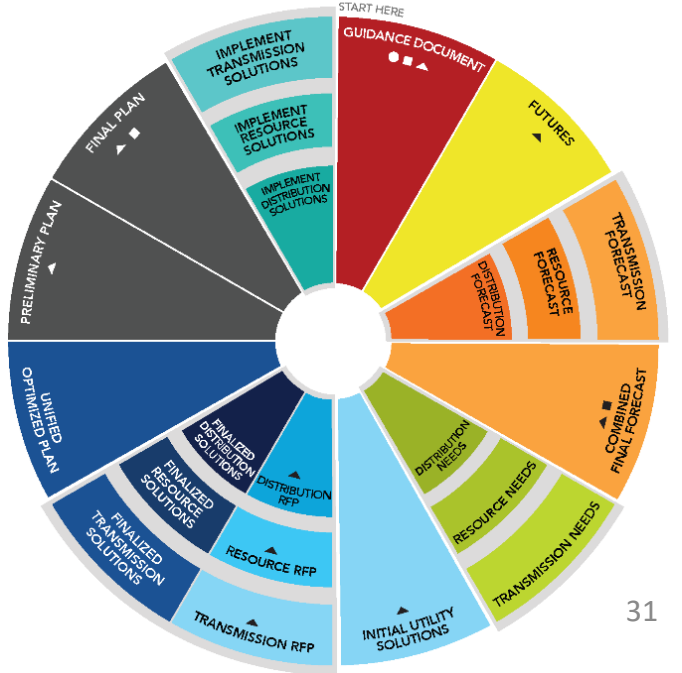


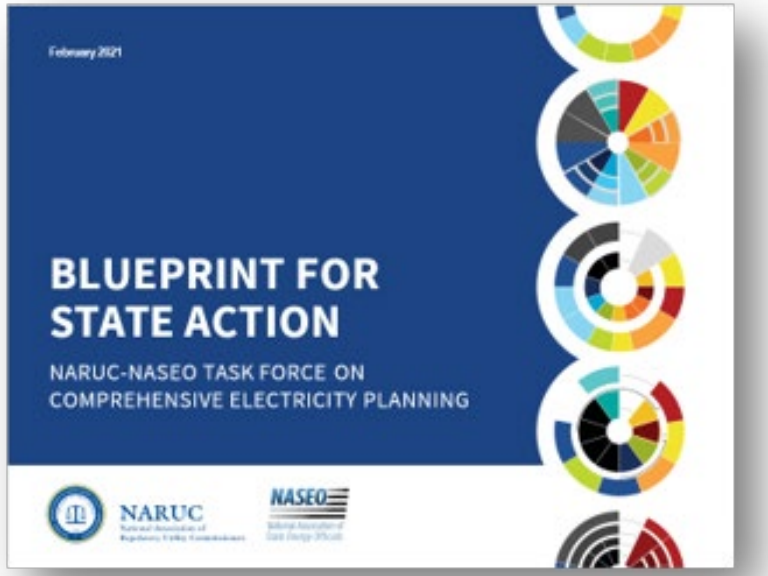
SILVER



TURQUOISE



The Blueprint for State Action offers Question Prompts within Three Steps



Step 1

Identify goals and starting point for electricity system planning

Step 2

Establish vision for better aligned planning

Step 3

Develop an action plan for achieving the vision

Comprehensive Electricity Planning

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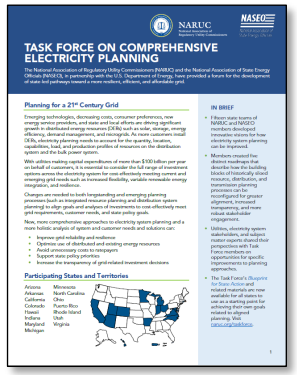
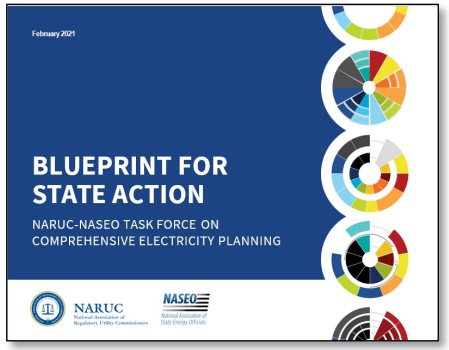
NASEO National Association of State Energy Officials

Task Force Resources

All Task Force materials are now available: www.naruc.org/taskforce

Task Force members, NARUC and NASEO staff, technical and subject matter experts, and others developed a robust set of resources to support state decision makers in advancing aligned electricity system planning processes.

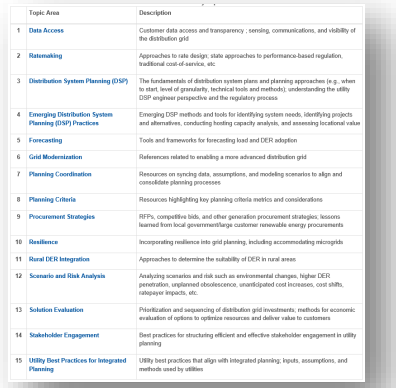




Opportunities to Improve Analytical Capabilities towards Comprehensive Electricity System Planning

Task Force Briefing Paper: *Standard Building Blocks of Electricity System Planning Processes*

Comprehensive Planning Library: resources across 15 topical areas



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Anticipated Challenges and Potential Solutions to Implementing Aligned Planning

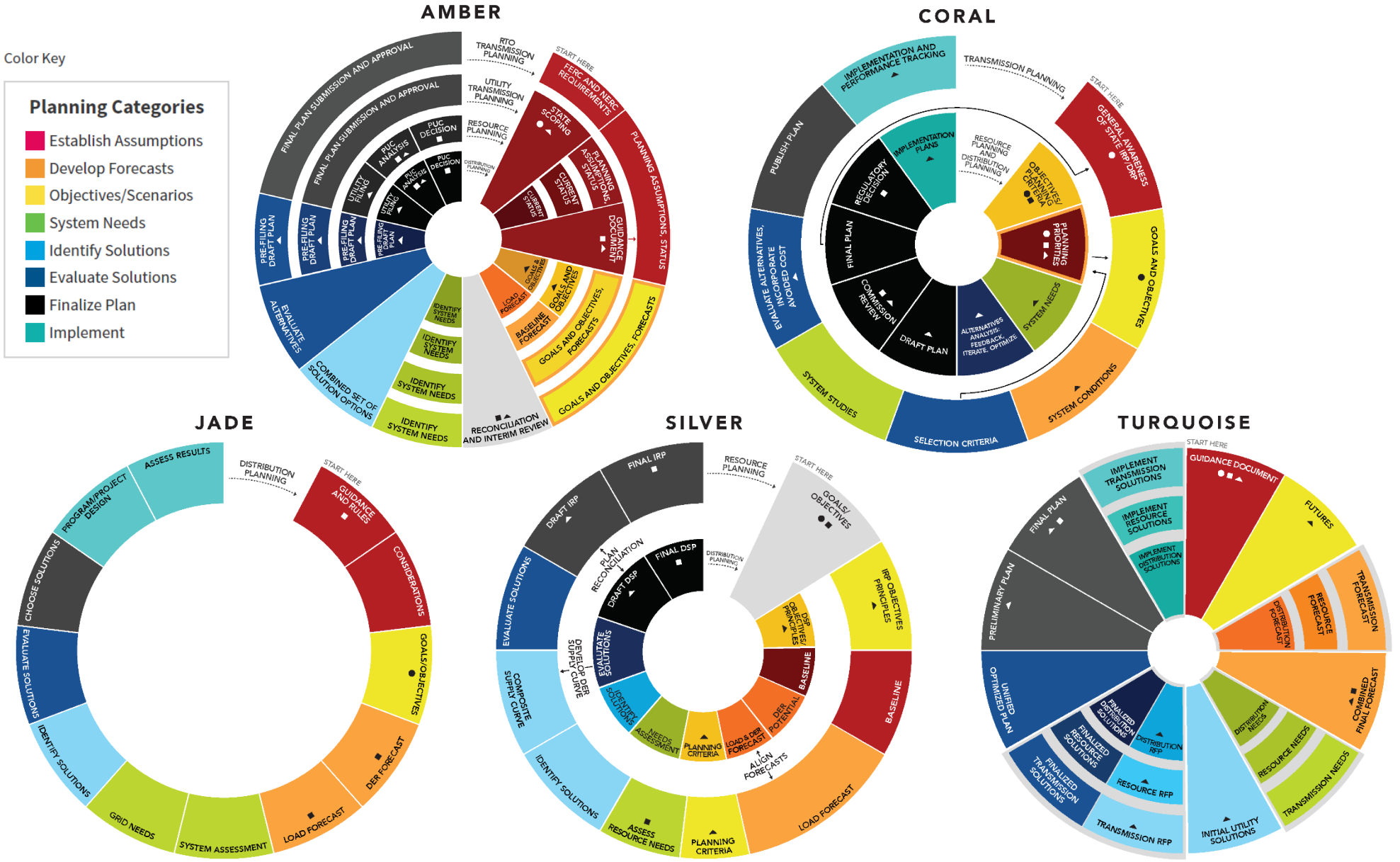
Actions for State Decision-Makers

Likely Challenges	Possible Solutions
Overcoming institutional inertia and resistance to beginning distribution system planning or integrated planning processes	• Support s • Identify o • Develop a • Establish • Focus on • Require a • Provide a • Require g • Direct the • Provide in • Seek and • Identify a • Formally • Ask utiliti
Ensuring new planning processes add value, are not overly burdensome or slow, and connect to other efforts	• Work with • Issue PUC • Specify rc • Review st • Encourag • Leverage • Incentiviz • Establish orders • Provide a • Clearly sig

Actions for Utilities

Likely Challenges	Possible Solutions
Uncertainty about integrating new technology into power system operations	• Facilitate early consideration of operational impacts from new technologies, and host conversations with impacted utility colleagues at project onset • Expand internal training to lead to more nuanced distribution operation management (e.g., distinguishing between types of DERs) • Stimulate discussion of how DERs present career opportunities for distribution engineers • Encourage distribution engineer/distribution planner participation in DER stakeholder processes • Develop a change management plan; prioritize possible actions; incrementally address highest priorities
Insufficient agreement on attributes of DERs	• Identify functional requirements in a technology-neutral matter, and with sufficient detail to evaluate/choose between alternatives • Conduct targeted local studies on DER attributes • Foster partnerships with stakeholders in applying for technical support from National Laboratories, DOE, and others • Encourage distribution engineer/distribution planner participation in DER stakeholder processes • Leverage utility test beds and pilots; conduct pilot programs to test out different use cases; establish criteria, timeline, and data for evaluation of results
Insufficient tools for conducting integrated analyses	• Collaborate with other utilities or in-state organizations to share costs of developing improved tools for modeling • Expand staff training and capacity building • Conduct open requests for information to identify tools and resources that are available for specific analyses • Seek partnerships to promote data sharing; require vendors to leverage open-source tools • Resist black box modeling: secure support from National Laboratories or universities, disclose data assumptions and inputs, make models public to reduce back-and-forth over assumptions and conclusions, build capacity in state decision-making bodies
Insufficient data availability and transparency for stakeholders; confidentiality of information and data used for analysis and decision-making	• Establish inventory of available data • Establish clear use cases for data to inform data portal design and data requests • Establish clear rules on access to data • Avoid information dump/overload; use publicly available datasets where possible; release relevant and anonymized data to parties in proceedings with nondisclosure agreements • Identify and share minimum list of parameters and inputs used for modeling • Gather best practices from other states regarding nondisclosure agreements • Involve the "right people" who understand the rationale for data requests and can help find solutions if the specific request(s) does not work

Visions for Aligned Planning



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Thank you!

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