Analytical Capabilities to Support Comprehensive Electricity Planning

National Council on Electricity Policy Annual Meeting

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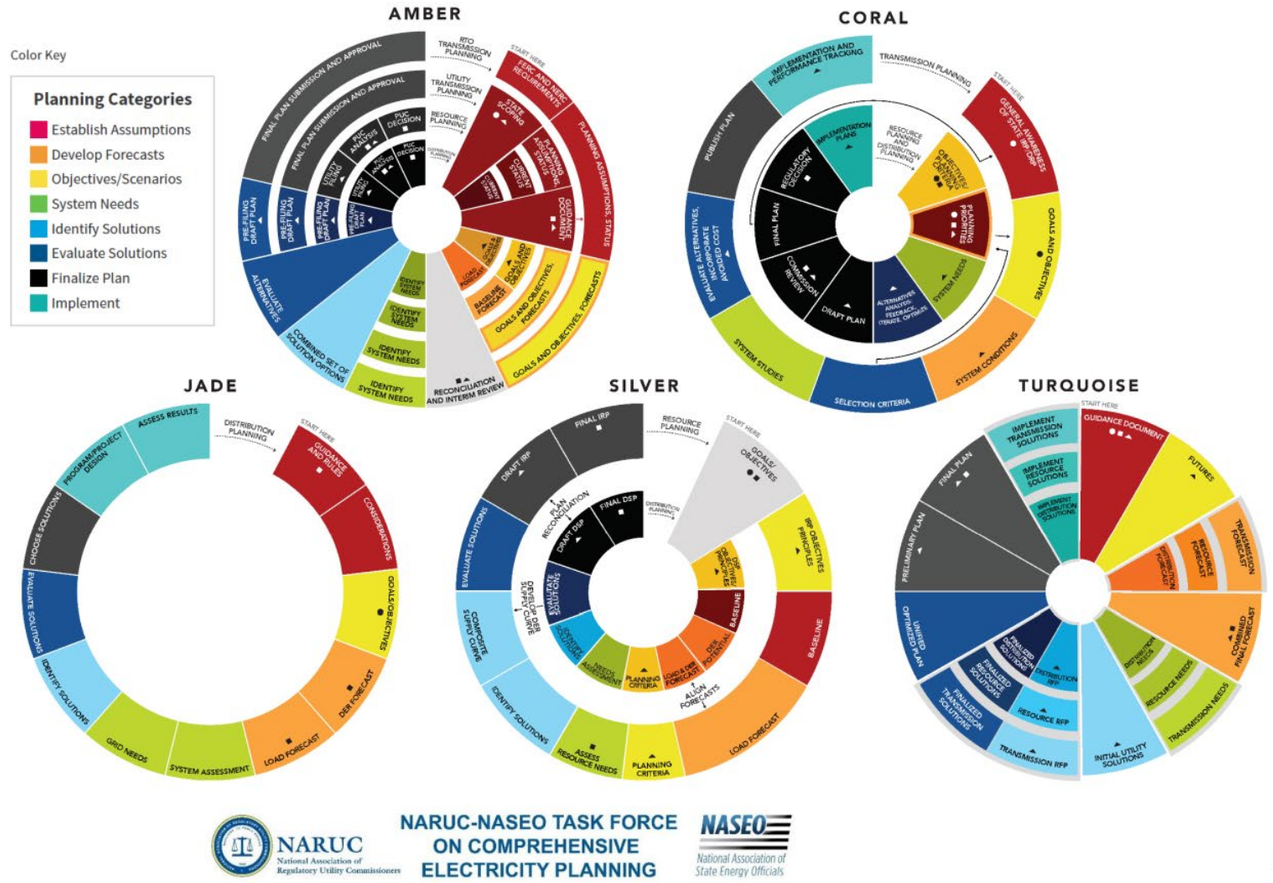
Key Takeaways

There are some commonalities in the cohort visions

Analytical capabilities can support their realization

Improved planning can enable better outcomes

I like Venn diagrams. A lot.



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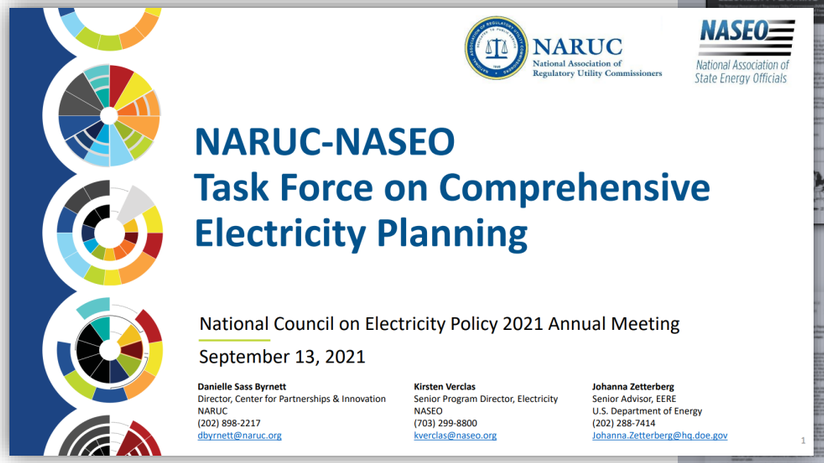
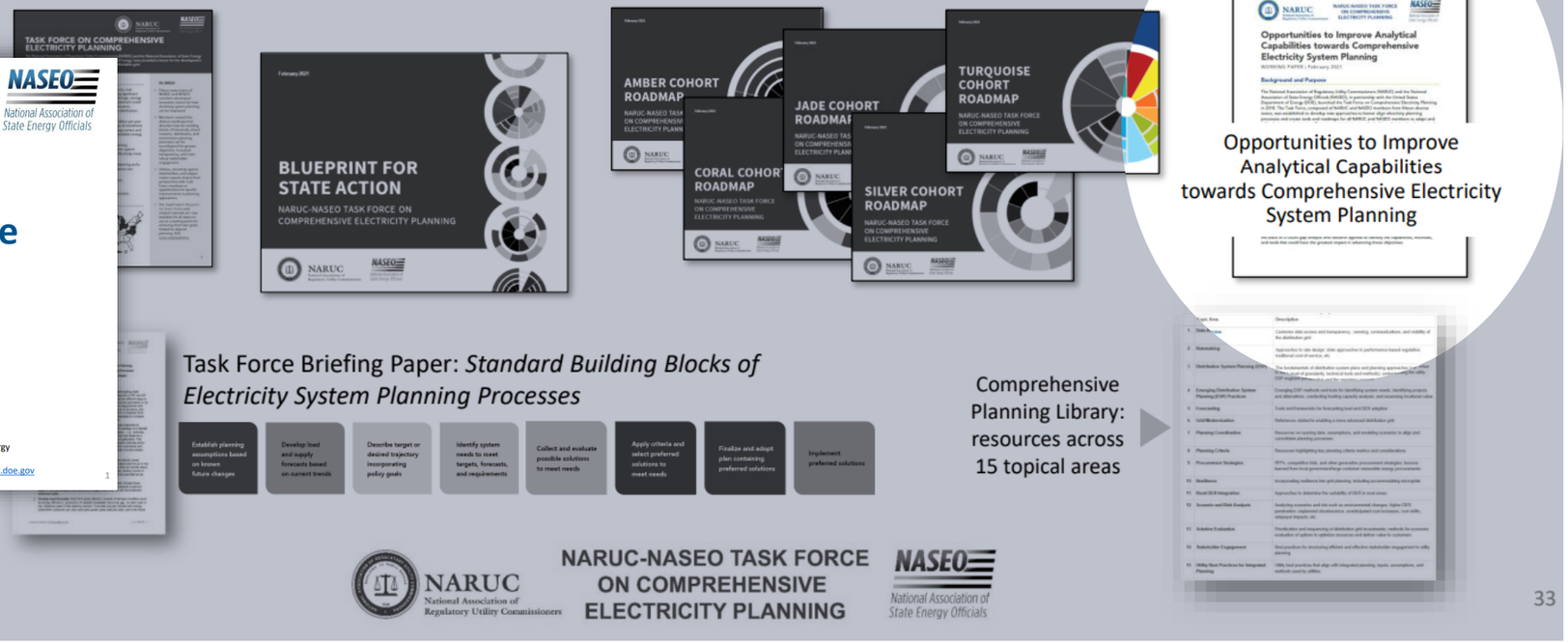
Building on the NARUC-NASEO Task Force on Comprehensive Electricity Planning (see day one plenary)



Task Force Resources

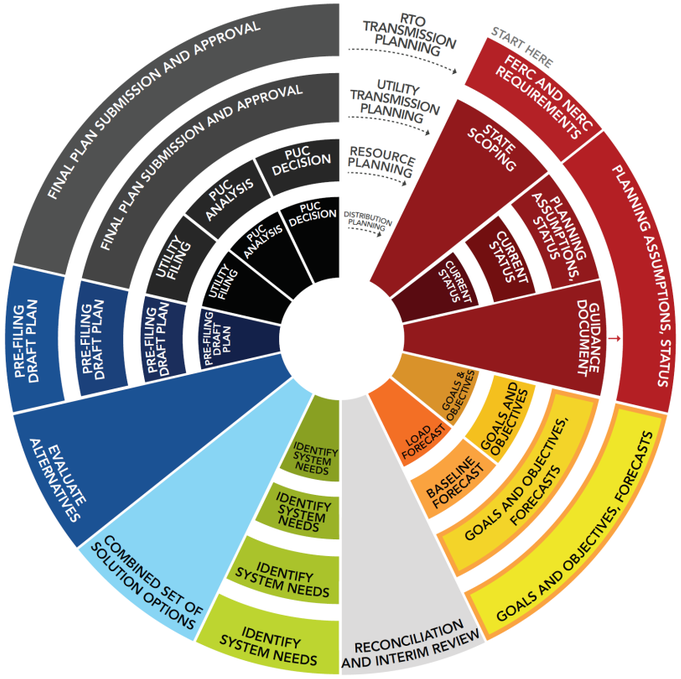
All Task Force materials are now available: www.naruc.org/taskforce

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.



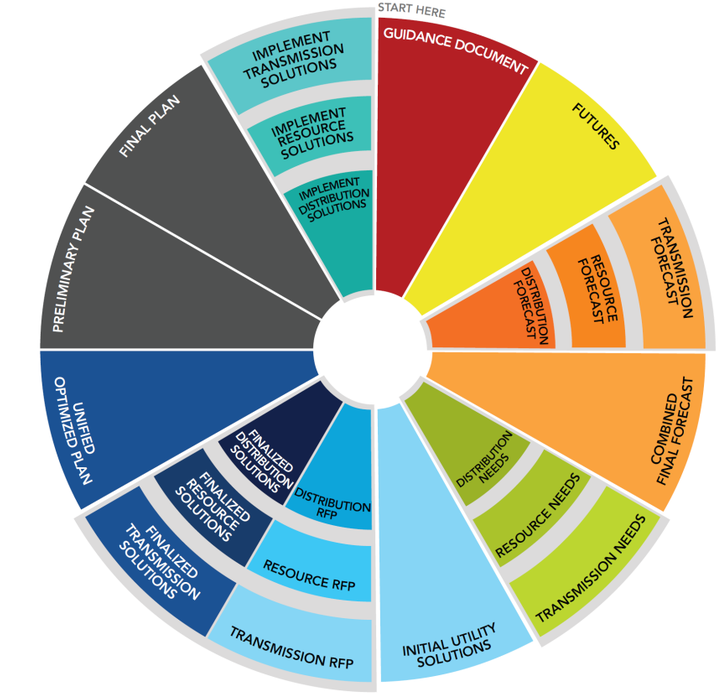
→ “Opportunities to Improve Analytical Capabilities”

AMBER



- 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

TURQUOISE



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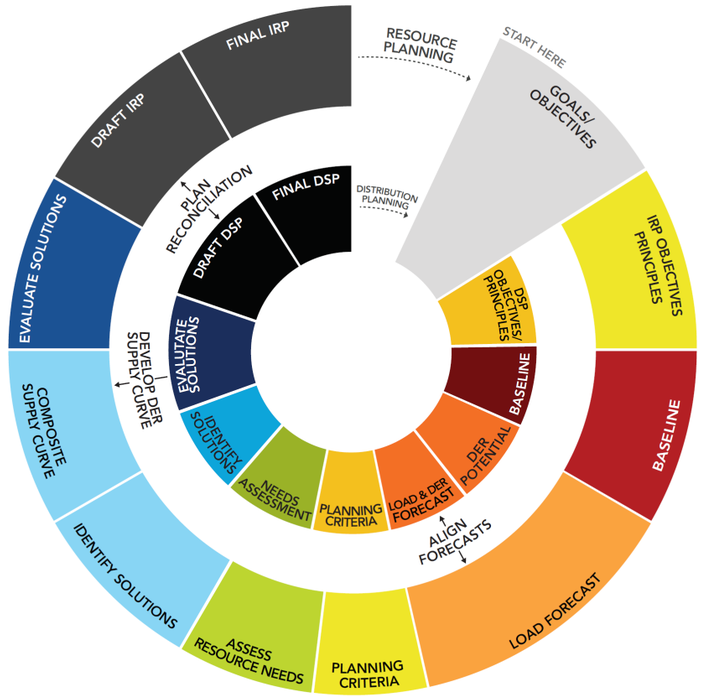
- Identify Solutions to Address Needs
- Evaluate and Apply Criteria to Determine Preferred Solutions
- Finalize Solutions, Approve and Publish Plan
- Implement

SILVER



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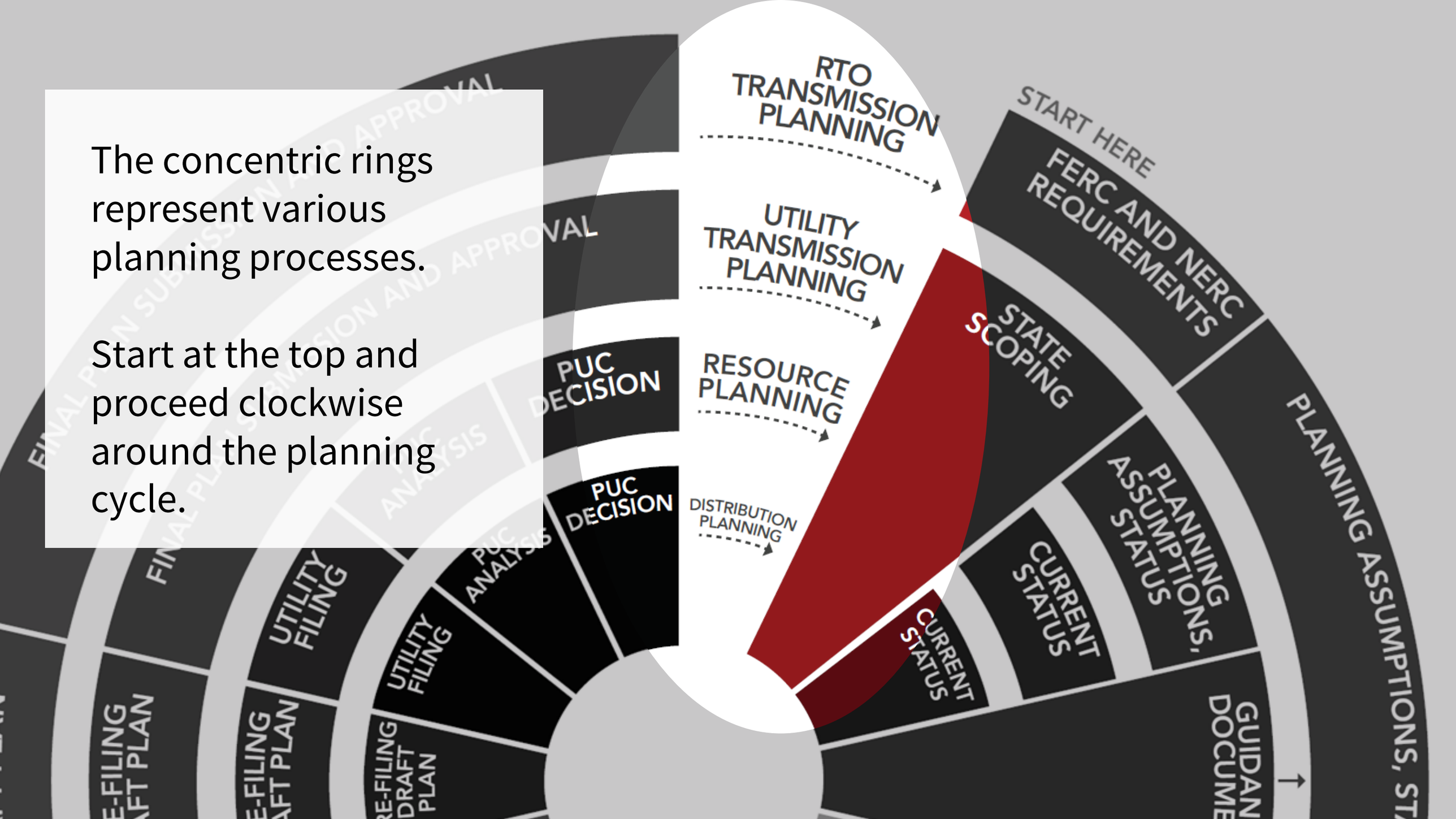
Different visions for comprehensive planning


The concentric rings represent various planning processes.
Start at the top and proceed clockwise around the planning cycle.
RTO TRANSMISSION PLANNING
UTILITY TRANSMISSION PLANNING
RESOURCE PLANNING
DISTRIBUTION PLANNING
START HERE
FERC AND NERC REQUIREMENTS
STATE SCOPING
PLANNING ASSUMPTIONS, STATUS
PLANNING ASSUMPTIONS, CURRENT STATUS
CURRENT STATUS
GUIDANCE DOCUMENT
PUC DECISION
PUC ANALYSIS
UTILITY FILING
PRE-FILING DRAFT PLAN
PUC DECISION
PUC ANALYSIS
UTILITY FILING
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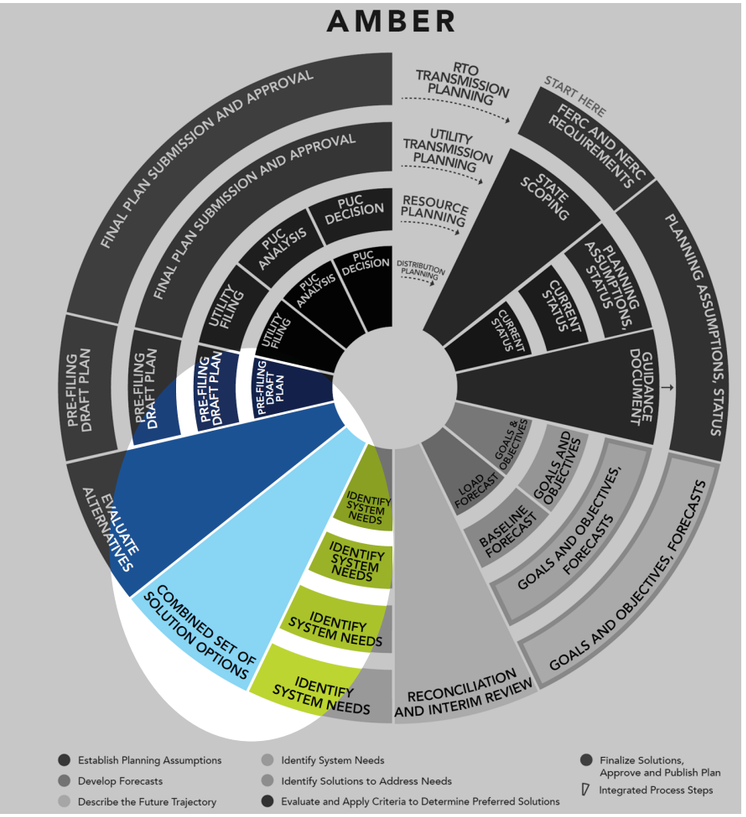
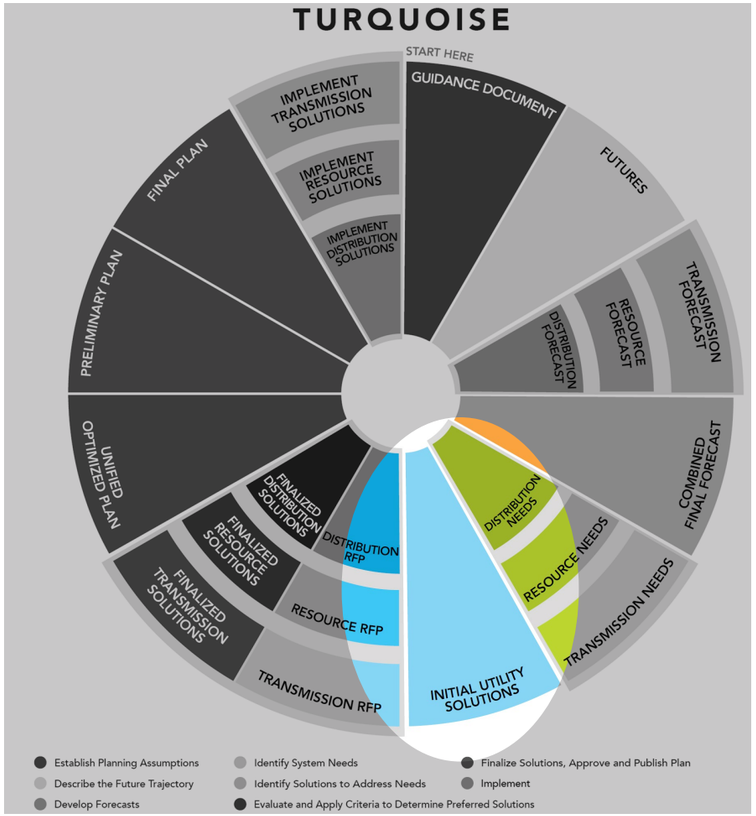
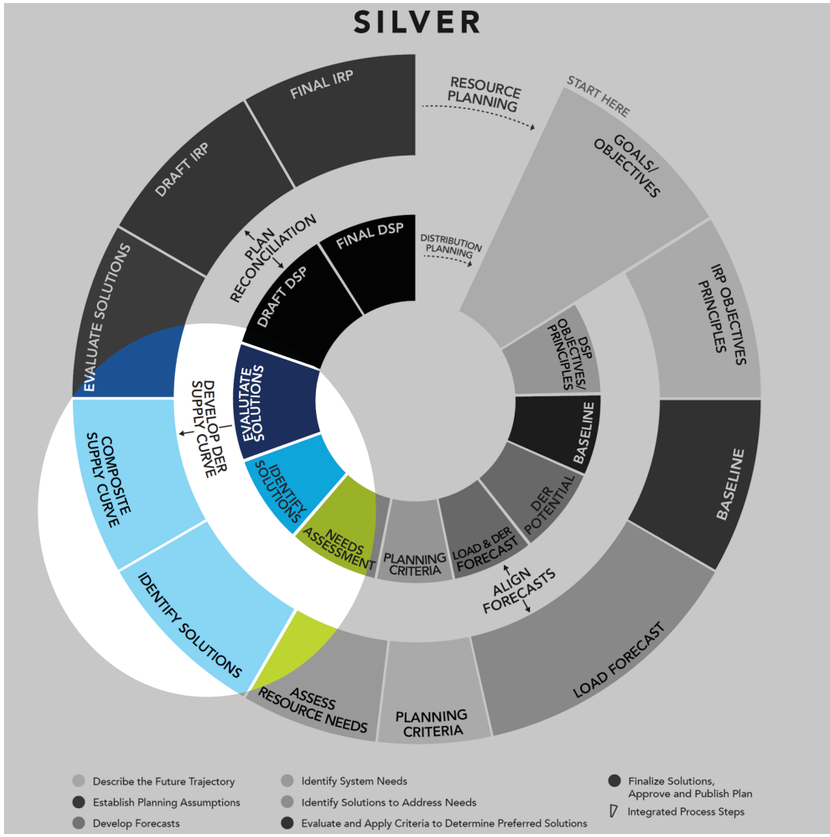
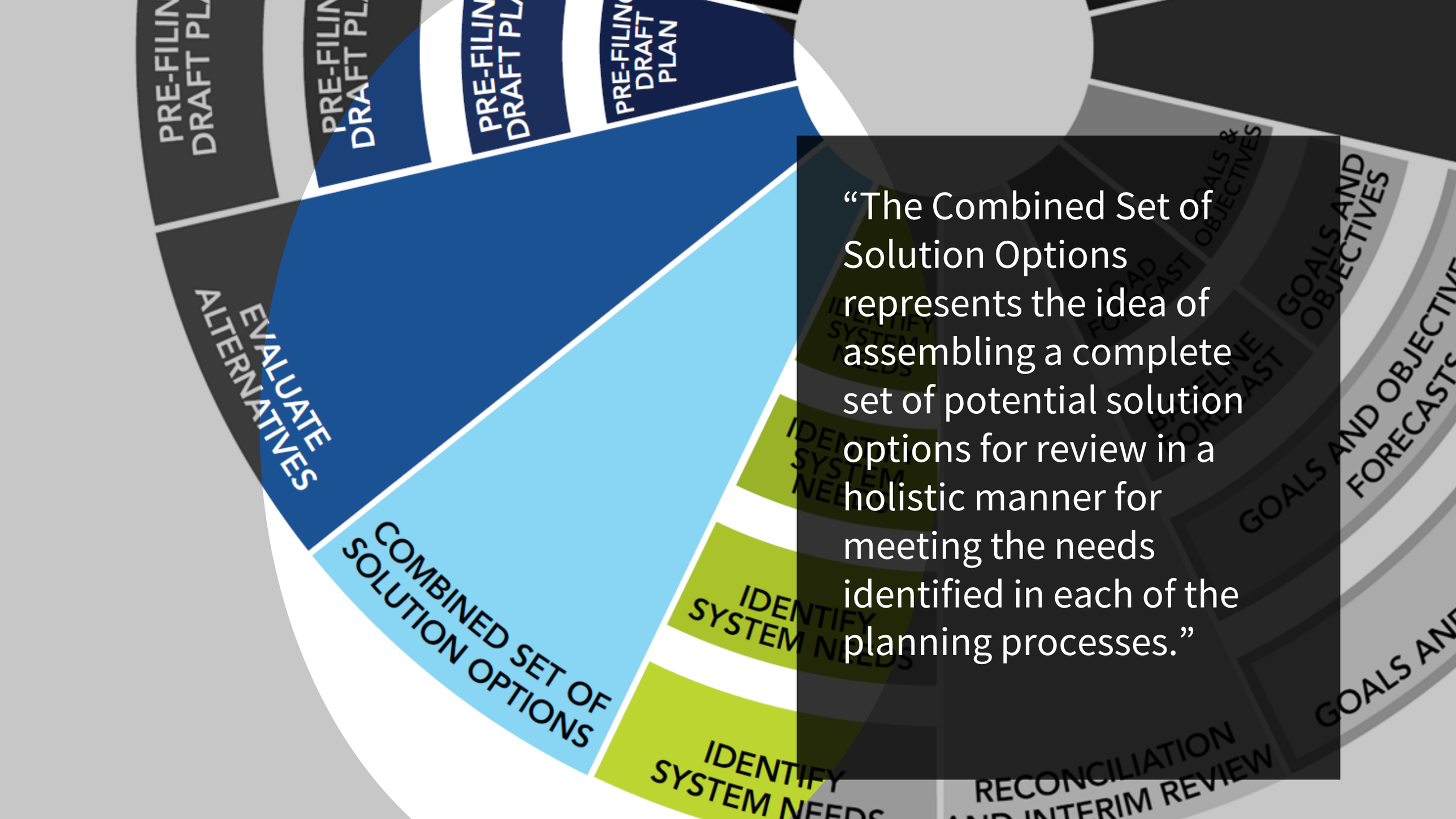
FINAL PLAN SUBMISSION AND APPROVAL



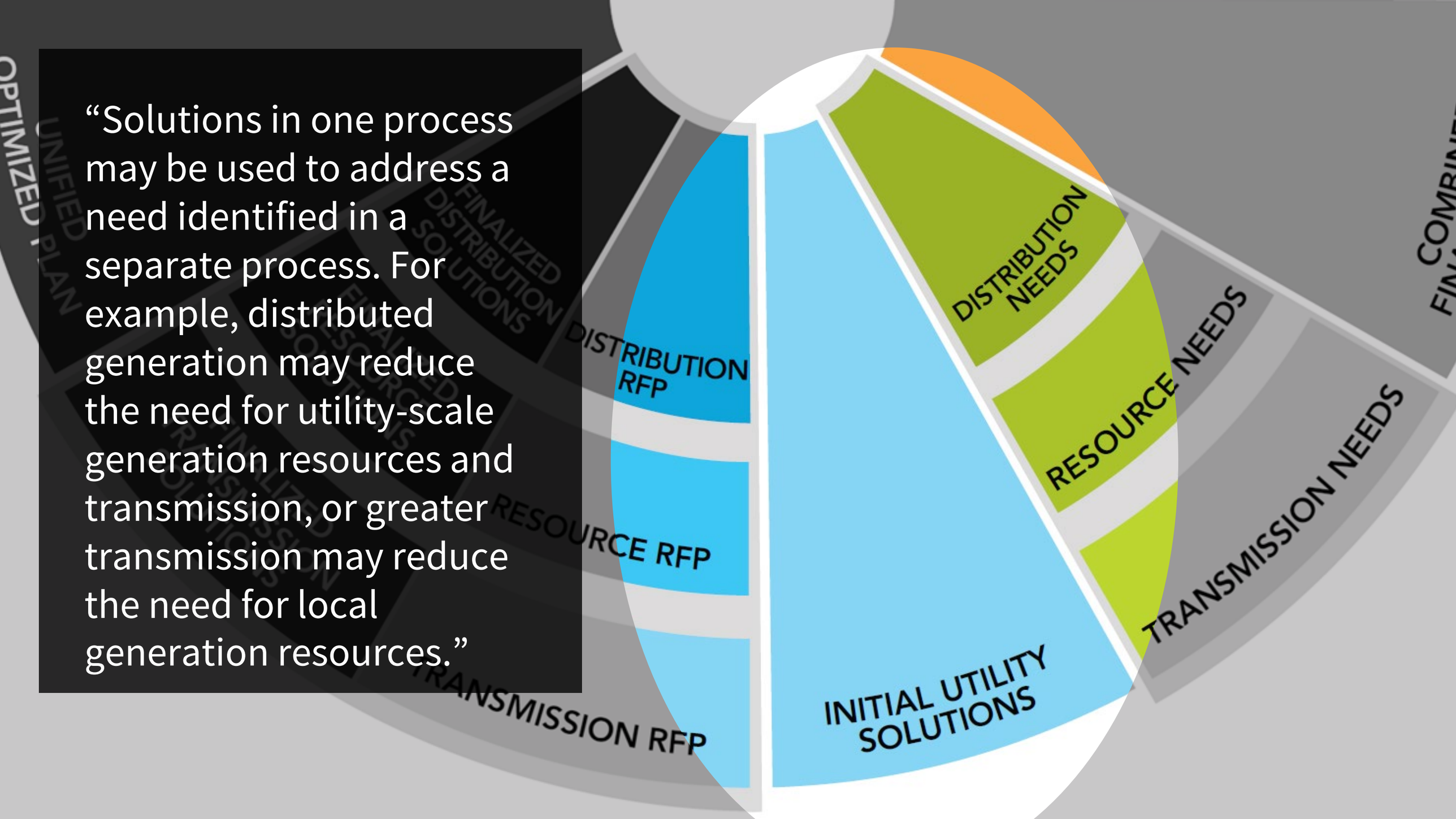




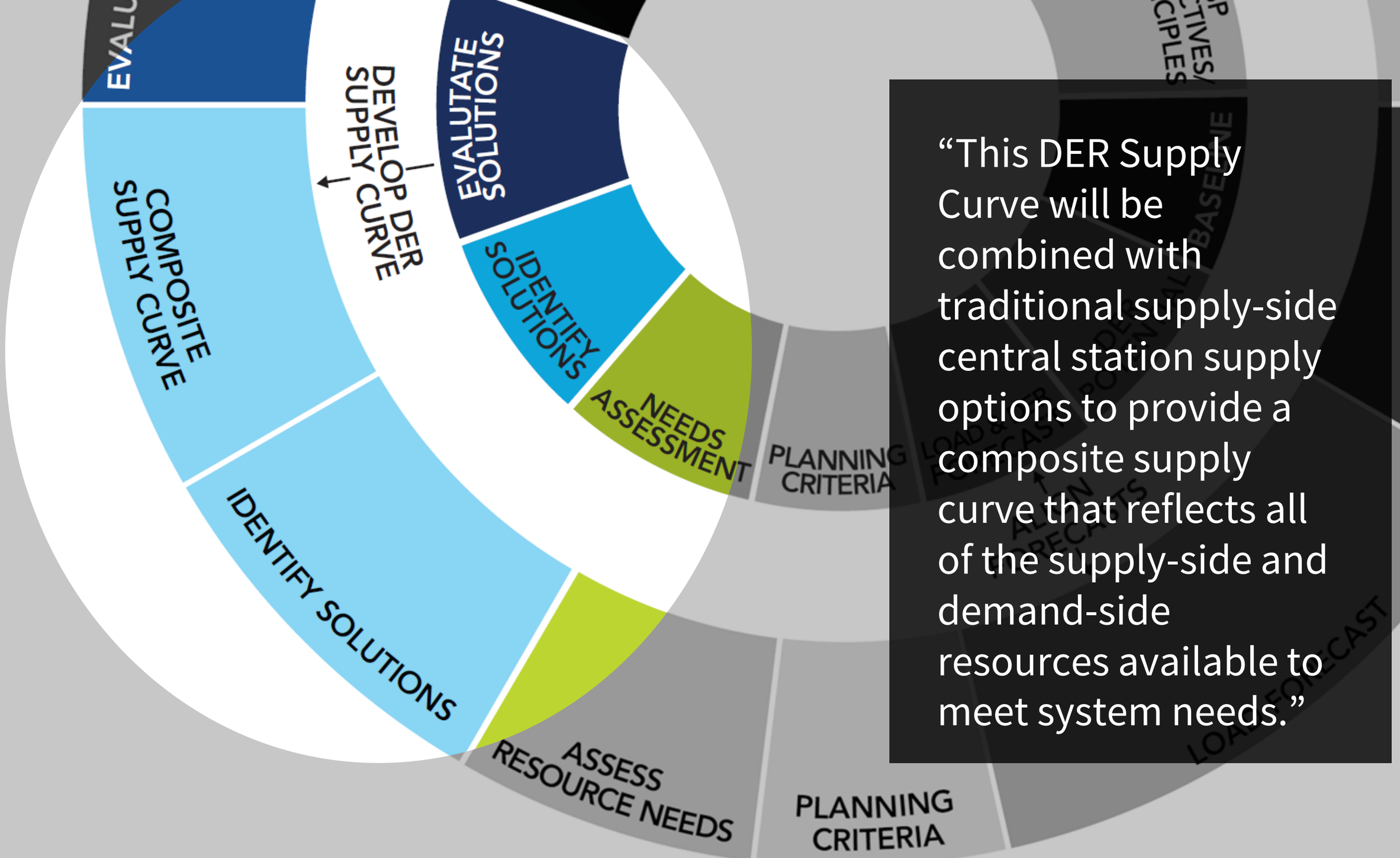
But we see commonalities across these visions



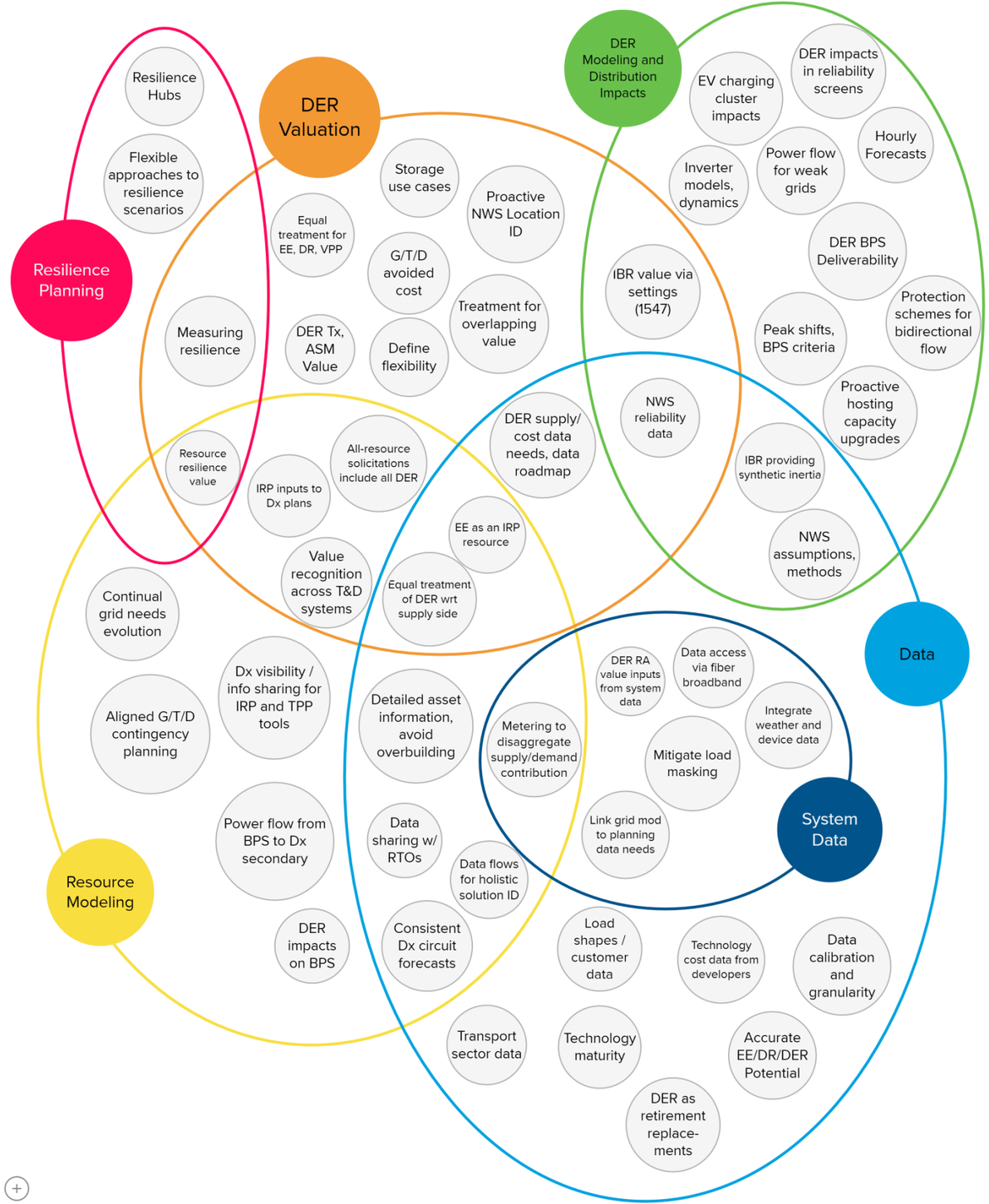
"The Combined Set of Solution Options represents the idea of assembling a complete set of potential solution options for review in a holistic manner for meeting the needs identified in each of the planning processes."



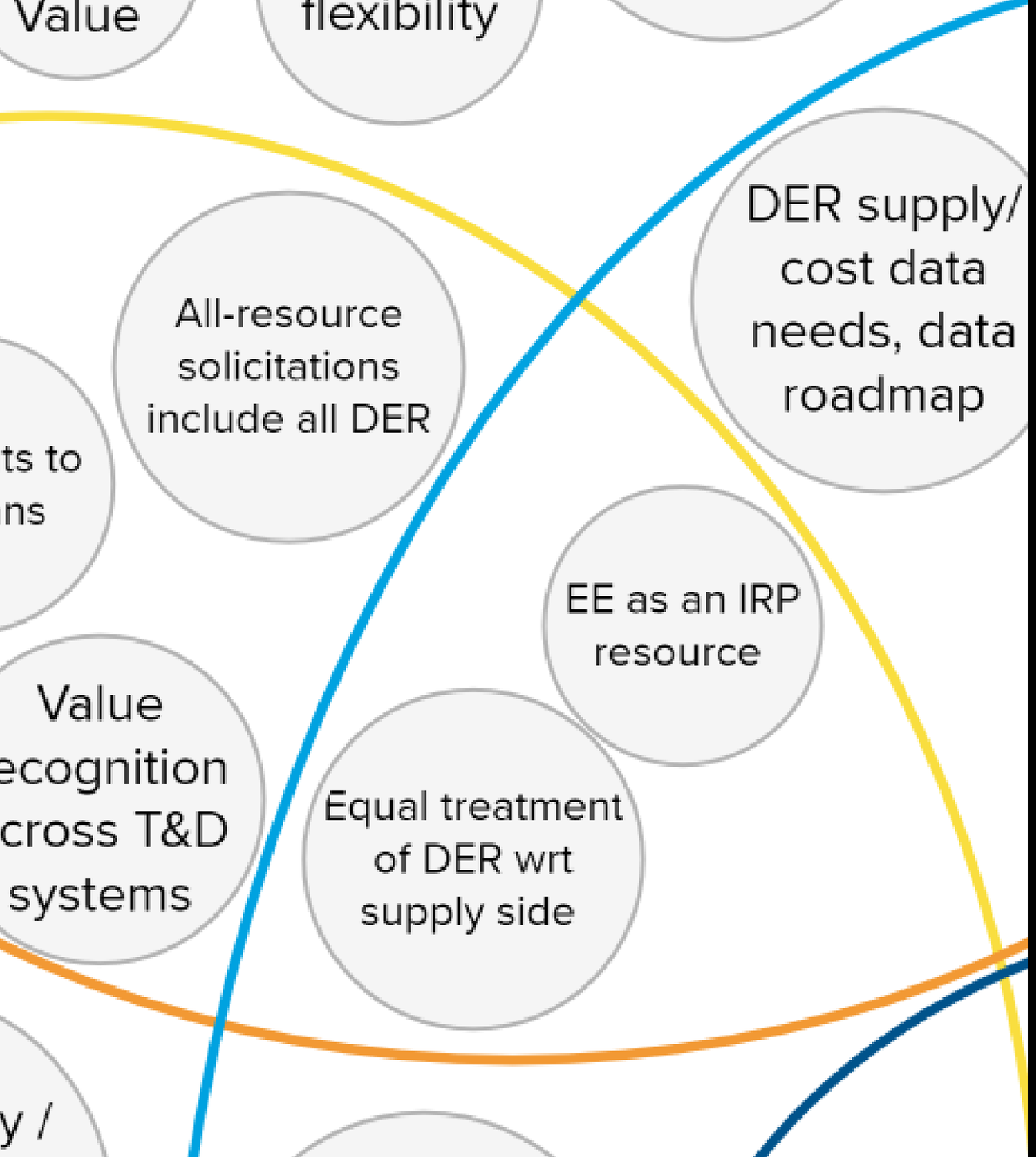
"Solutions in one process may be used to address a need identified in a separate process. For example, distributed generation may reduce the need for utility-scale generation resources and transmission, or greater transmission may reduce the need for local generation resources."



"This DER Supply Curve will be combined with traditional supply-side central station supply options to provide a composite supply curve that reflects all of the supply-side and demand-side resources available to meet system needs."



"What data, modeling, tools, or research could help fill gaps between the vision and what's currently feasible? If a Genie gave you three wishes to spend on improving planning processes, what would you wish for?"



Some of the feedback we received:

Models need to advance to enable evaluation of DER aggregation with supply side resources

[We] need new modeling approaches to evaluate DER in the same way they evaluate supply central station generation

…not just feeding the IRP process from DSP, but also providing input to the DSP

Building a DER supply curve to enable that interface requires an understanding of the data needed to do that analysis and a data roadmap

Treatment DER in an apples-to-apples in a way that's similar to supply-side resources in IRP requires granular resource information about quantity/cost of resources available

Some of the feedback we received:

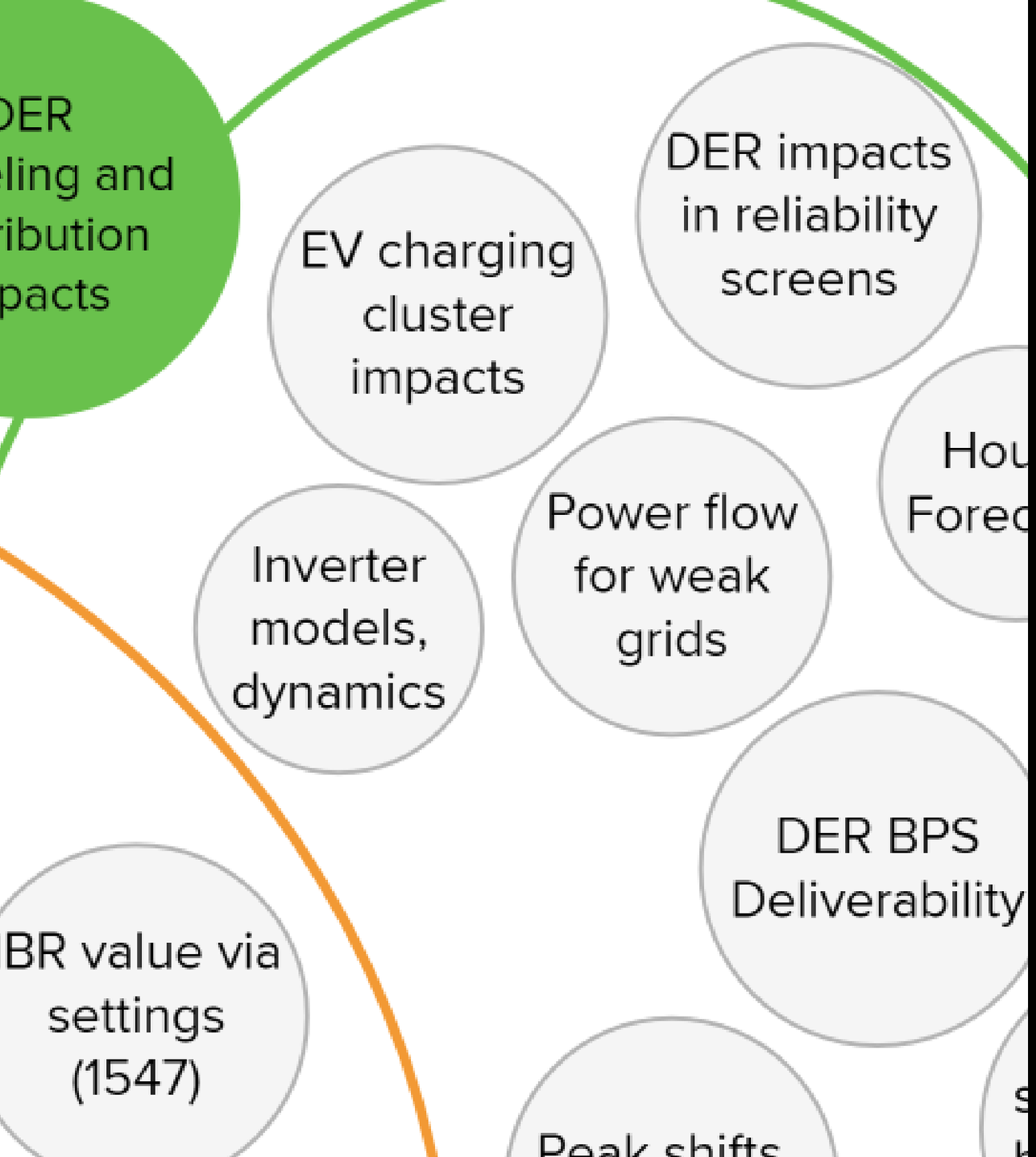
How do you measure the resiliency of the system and how is that reflected in planning tools?

Important to recognize the contribution of resources to advancing resilience and how much

We need to integrate microgrids into the planning more broadly

The risk reduction benefits of grid mod and microgrid deployment are not being quantified

Incorporation of risk assessment and resilience into distribution planning is needed



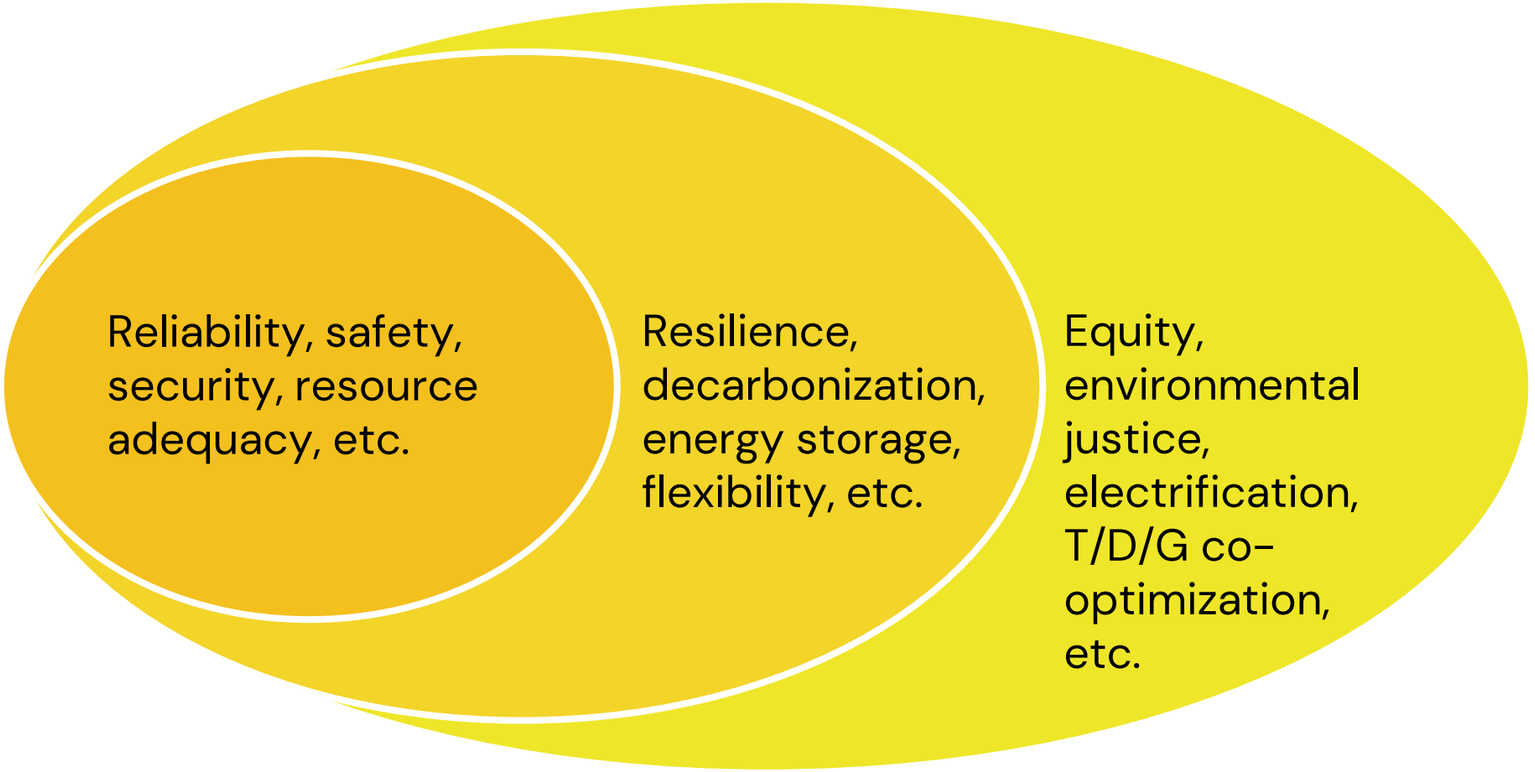
Some of the feedback we recevied:

Representation of inverter-based resources in system dynamics modelling is important, inverter models will inform planning criteria

Data quality: need to capture actual inverter data sheet vs "typical" , reflect software updates that impact characteristics, harmonics

Impact of high penetrations of DER on bulk system reliability not-fully-understood/studied, hampers planning.

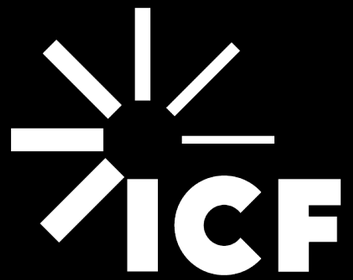
Managing high penetrations of inverter-based resources under weak grid conditions will require new approaches to power flow modeling



What are we planning for?

Next Steps

- Revised working paper
- Tool inventory
- Gap analysis and recommendations



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