



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

Overview

At the April 2019 workshop in Denver, each cohort of 3 or 4 participating state commissions and energy agencies developed first drafts of “process maps” (flow-chart diagrams) of IRP and DSP processes and their possible alignment. That effort revealed that there can be different ways to diagram the same planning process depending on the level of detail or process granularity to be depicted, and that major sub-sections of a given planning process may be diagrammed with more or less granularity depending on the cohort’s choice of emphasis and its familiarity with that sub-section of the process. Thus the various cohort diagrams ranged in complexity from having just over a dozen process steps to around 80, which makes it challenging to compare across cohorts and across individual states and processes within cohorts.

This paper is intended to help simplify further development of the process maps by offering a framework to manage multiple levels of process granularity. The strategy is to identify a small set of standard or generic major building blocks (BB) or process elements — i.e., activities and deliverables essential to any electricity system planning process — and use these as a common language to represent each planning process at a coarse level of granularity. The underlying hypothesis is that there is a common logic to electricity system planning which these BB can represent, and that key differences between processes and jurisdictions can be captured most effectively by filling out the more granular process details.

Standard Planning Building Blocks

The following are suggested as the major BB that characterize electric power system planning processes. BB 1-6 are analytic/technical in nature and focus on the results needed for an effective planning process, i.e., the “what.” As such they do not talk about specific methods or tools to accomplish the results (the “how”), nor do they identify the entities responsible for each of the steps or mention points of stakeholder engagement or regulatory action. All of these other elements would be specified as we describe the more granular details of the major BB. (Color designations refer to how the BB are represented on the process maps.)

Planning Categories

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

1. **Establish planning assumptions (red).** Planning assumptions generally include future system changes that are known with high confidence, such as scheduled in-service dates of new grid infrastructure additions or supply resources, as well as scheduled retirement dates. Red building blocks should reflect model inputs, descriptions of the current system, asset inventories, additions, retirements and other input assumptions that drive the planning process.

2. **Develop load forecasts (orange).** Build from gross demand, impacts of demand modifiers (such as energy efficiency), production of variable renewable resources, etc., for each year or key milestone years of the planning horizon. Forecasts typically include both energy (total MWh consumed per year) and peak power (peak load per year), but in the future may include load-profile characteristics such as fast-ramping needs over certain hours. These forecasts could be considered to describe a business-as-usual (BAU) trajectory, where the system is headed if we continue on the current path.
3. **Describe the desired future trajectory (yellow),** including targets and milestones derived from policy goals or mandates. Yellow building blocks represent processes focused on setting planning goals, objectives, scenarios or future milestones that the planning process should aim to achieve.
4. **Identify needs (green).** These may derive from gaps between the desired (BB 3) and the BAU (BB 2) trajectories that can be affected by targeted actions, or simply as requirements to achieve BAU forecast trajectory. At a more detailed level of granularity this building block could include different types of engineering studies such as hosting capacity analysis and methods to quantify locational value of DER deployment.
5. **Identify a range of possible solutions to address the needs (light blue),** considering factors such as rapidly evolving technologies and concerns about resilience. At a more detailed granularity level this building block could include opportunities for stakeholders to propose solutions to meet identified needs.
6. **Evaluate and apply criteria (dark blue) to determine the preferred solutions for the needs.**
7. **Finalize (black) the preferred solutions and publish the overall plan,** typically as part of a regulatory or governing board process.
8. Initiate actions to **implement (aquamarine) the preferred solution** (may include competitive solicitations, retail rate structures, programs, etc.).

Some observations on the building blocks listed above:

- They are arranged in a logical sequence in terms of an overall process flow, though there may be cases where this sequence is different. E.g., some jurisdictions may combine BB 6 and 8, so that the preferred solution is discovered in implementation through an RFP process, while others may keep these blocks separate, deciding on the preferred solution first through engineering and benefit-cost analysis (BB 6), and then narrowing the RFP to elicit only proposals to implement the preferred solution (BB 8).
- They focus on “what” needs to be done within each block; they do not consider “who” will perform each block and “how” they do it. Also they do not get into lower-level specifics, e.g., to what extent a building block can and should include broader stakeholder participation or collaboration between specific entities.
- They generally assume that all planning processes recur on regular cycles, but do not yet try to capture information flows between successive cycles of a process or between different processes running in parallel. For example, solutions adopted in BB 7 will be inputs to the planning assumptions (BB 1) for a subsequent planning cycle. This building block structure should allow these relationships to be added as this initiative proceeds.