

Scenario Best Practices

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Goals

1. Enhance PJM's transmission planning process to plan on a forward-looking basis for known determinants and produce actionable, cost-effective plans.
2. Ensure:
 3. Reliability
 4. Efficient interconnection of new resources
 5. Efficient markets

Scenarios are crucial to identify least-regrets transmission solutions.



Creating Scenarios

Transmission planners should create realistic scenarios that **incorporate 7 factors**, and are plausible and diverse.

Order 1920 Requirements: Scenario Inputs

- At least three plausible and diverse Long-Term Scenarios based upon best available data
- Seven required factors. Factors 1-3 cannot be discounted, factors 4-7 must be considered

Scenario Inputs

Required Factor Categories

1. Laws and regulations affecting future resource mix and demand
2. Laws and regulations on decarbonization and electrification
3. Integrated Resource Plans and expected supply obligations for LSEs
4. Trends in technology and fuel costs within and outside of the electricity supply industry, including shifts toward electrification of buildings and transportation
5. Retirements
6. Generation interconnection requests and withdrawals
7. Utility and corporate commitments and other public policy goals

Must be included.

Vary based on probability weighting

Scenario Inputs

Factors 4-7 can vary across scenarios based on probabilistic weighting.

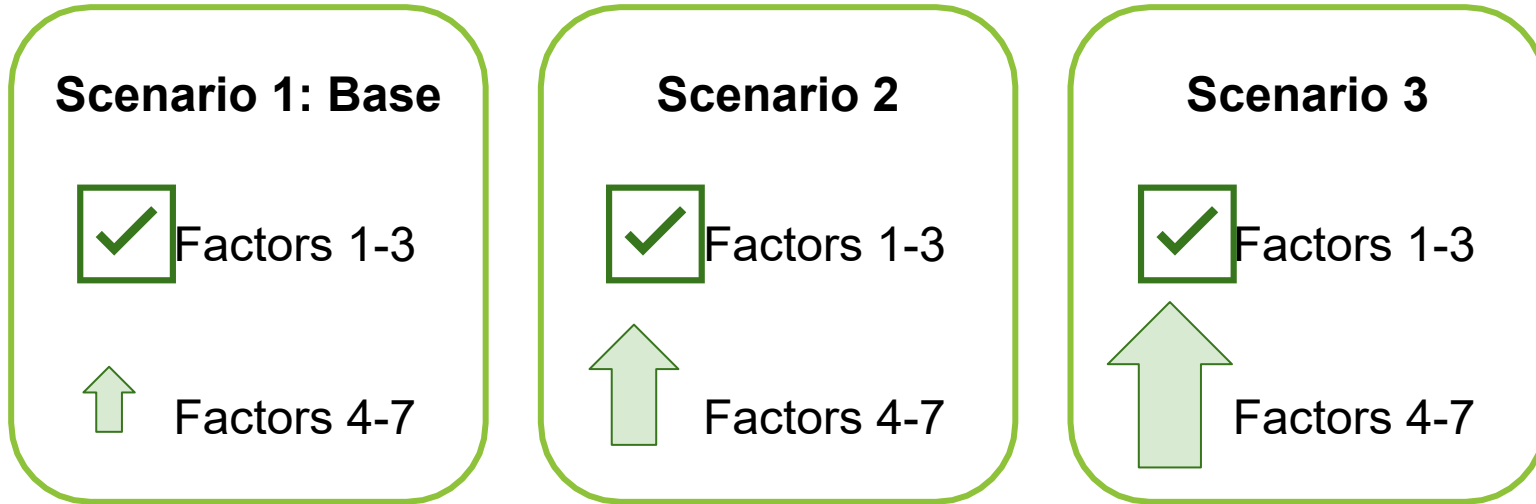
- Probability of Factors 4-7 must be based on best available data*
- Justification for probability weighting must be transparent and developed with stakeholder input.
- A reasonable amount of Factors 4-7 must be in the minimum scenario. “No change” is not a plausible future.
- Highest scenario must be approaching fully decarbonized system.

Scenarios must be diverse enough to represent different visions of the future, but also each must be premised on a sound reasoning to produce useful findings with which to identify least regrets transmission projects.

* See presentation by Nick Lawton from Earthjustice.

Scenario Inputs

Base Scenario should be realistic based on inputs. Additional scenarios should explore major risk variations that impact the future system.



Using Scenarios

Transmission planners should use scenarios to **identify needs** and **evaluate transmission solutions**.

Scenarios have Two Functions:

Need Identification:

Identify transmission needs
for the future electricity
system

Benefits and Selection:*

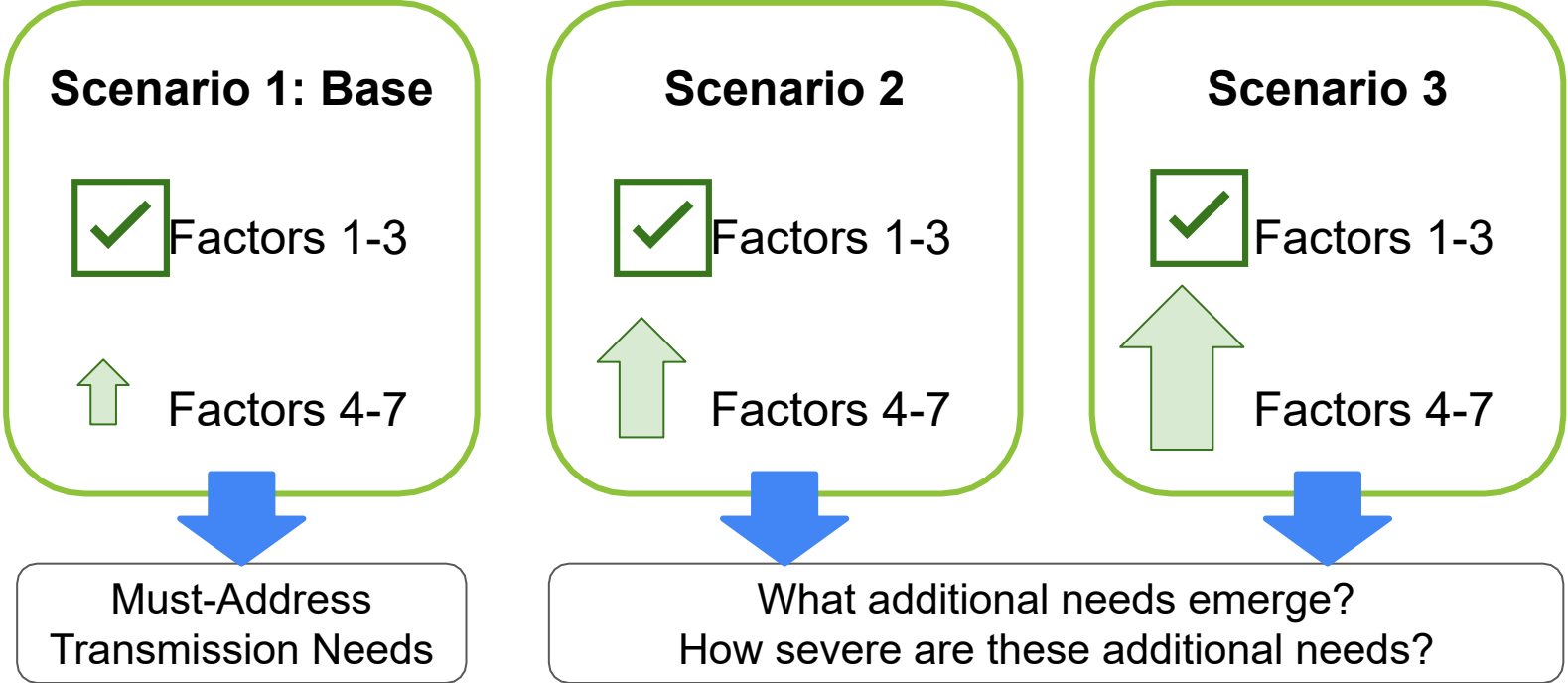
Evaluate solutions for
benefits and cost
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minimizing risk across
variables

* See presentation by Tom Rutigliano from NRDC.

Scenario Use for Need Identification

- Use base scenario to identify likely reliability violations caused by the future electricity system.
- Use scenarios 2 and 3 to look at additional risks that might materialize due to increases in Factors 4-7.
- Use sensitivities to evaluate low probability, high risk events.

Scenario Use for Need Identification



Sensitivities

Scenarios should capture major variables in the future, but sensitivities can adjust for tail-end events: low probability, high impact. Extreme weather needs to be part of each scenario, but there might be additional scenarios that PJM experts wish to use.

Guiding questions:

- What is a 1-in-10 event in the 2040s?
- Are we planning to 1-in-10, or something more robust?
- What is the interaction between weather and reliability? Might be non-linear.

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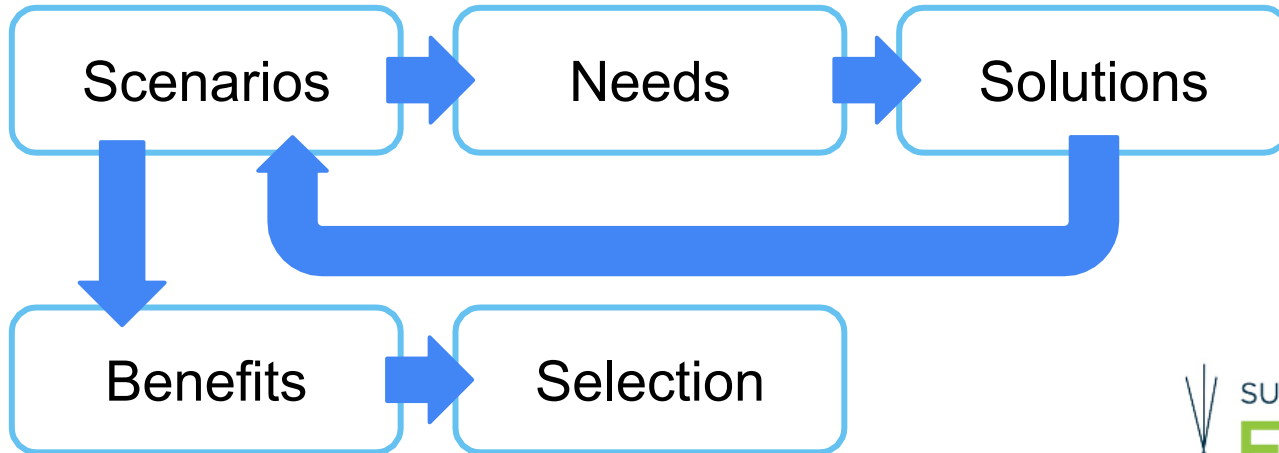
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* See presentation by Tom Rutigliano from NRDC.

Scenario Use for Benefits and Selection

Solutions should be evaluated in all scenarios to quantify benefits for each one.

More holistic solutions might show additional benefits in scenarios 2 and 3. All solutions must solve the needs in the base scenario.



Other Considerations

- Significant PJM staff time, effort, and judgement will be required to make this a reality.
- NRDC and partners stand ready to support PJM to make this process functional and efficient.



Thank you!

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