Multi-State Compliance and CP3T

A Presentation for NASUCA

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Webinar Logistics

Slides have been posted online at www.synapse-energy.com/nasuca_webinar_slides.

Please dial in at (650) 479-3208. You can access the webinar via WebEx at https://nasuca.webex.com/nasuca/j.php?MTID=m09825dd3c57ed444ddf886098f57f508

The webinar will begin with a 30-40 minute presentation, which will be followed by a Q&A period. Please mute all phones during the presentation. We will take questions on the conference call line during the Q&A period only.

During the webinar, please submit any questions via email to CP3T@synapse-energy.com

- We will be monitoring this email during the course of the webinar. We'll any questions directly after the presentation.
- If you think of any more questions once the webinar is completed, please email CP3T@synapse-energy.com

Synapse Energy Economics

- Founded in 1996 by CEO Bruce Biewald
- Leader for public interest and government clients in providing rigorous analysis of the electric power sector
- Staff of 30 includes experts in energy and environmental economics and environmental compliance

What is the Clean Power Plan?

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- EPA issued a proposed "Clean Power Plan" in June 2014. Issued under section 111(d) of the Clean Air Act, this proposed rule aims to cut carbon emissions by 30 percent below 2005 levels by 2030.
- The Clean Power Plan sets emission rate targets for each state for the years 2020-2030.
- Emission rate targets are constructed using "building blocks" – reduced emissions from coal heat rate improvements, natural gas combined cycle redispatch, generation from new and "at-risk" nuclear units, renewable generation, and energy efficiency.
- Generation and emissions used in the Clean Power Plan emission rate formula include existing coal, existing and under construction NGCC, existing oil and gas steam units, under construction and "at-risk" nuclear generation, energy efficiency, and renewables.

Multi-State Compliance

States are likely to achieve efficiencies towards compliance by grouping together.

Important issues to analyze include:

- Rate- versus mass-based compliance
- Level of integration
- Energy efficiency “leakage”

Multi-State Compliance

Region- or “combination”-specific issues

- Dissimilar renewable technical potentials
- Dissimilar existing resources
- Similar existing resources
- Possible nuclear retirements
- Different growth rates (economic or load)
- Utilities that cross state boundaries
- Vertically integrated utilities vs. RTOs
- Existing mechanisms for compliance or cooperation

What does a multi-state combination look like?

"Solo compliance" means that a state will file its compliance plan singly with the EPA.

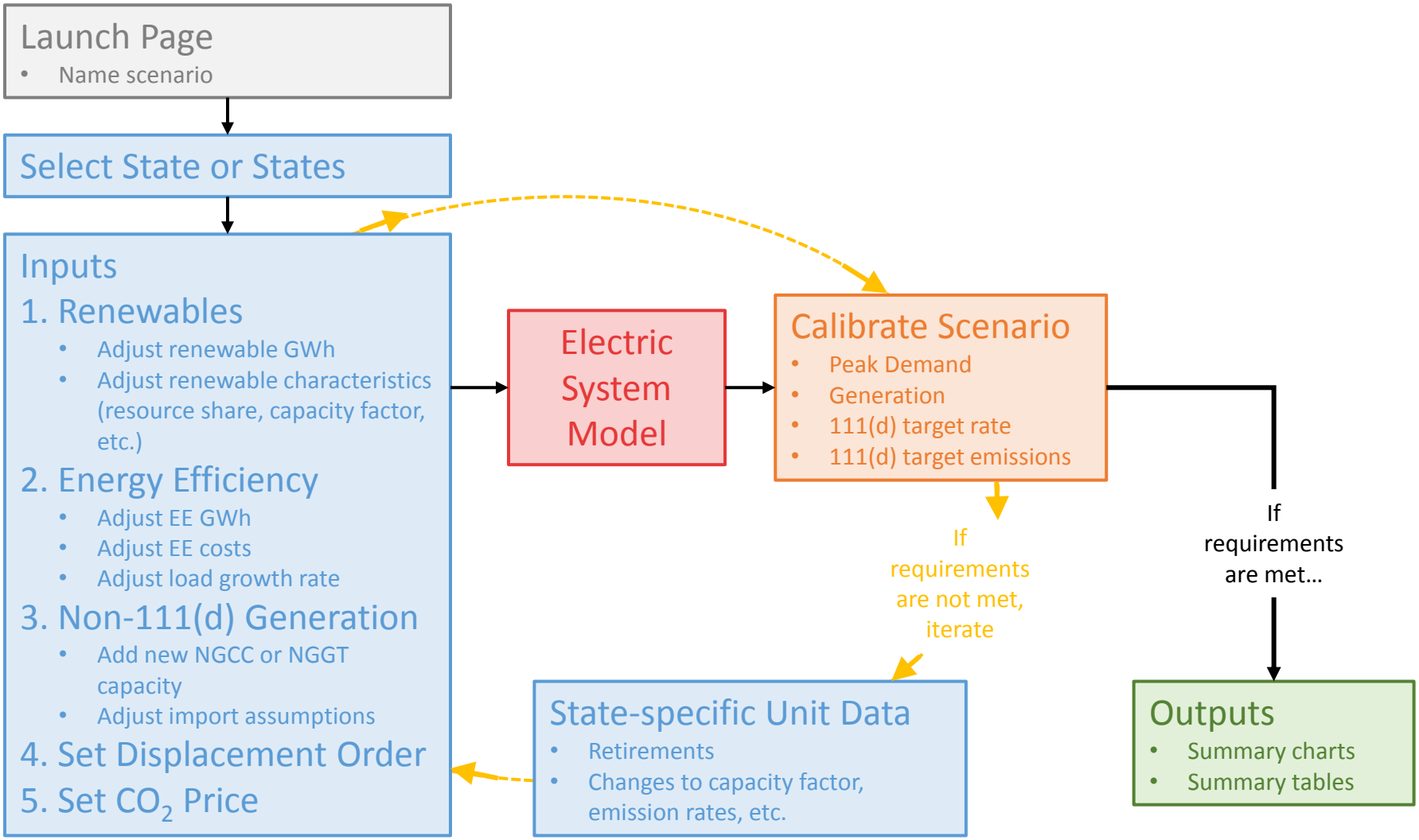
"Trading" means that a state will participate in interstate trading mechanisms to share resources or other commodities with other states.

"Joint compliance" means that a state will join with one more other states to file a single compliance plan with the EPA.

Overview of Clean Power Plan Planning Tool (CP3T)

- Synapse has developed a user-friendly Excel-based spreadsheet tool based on the unit-specific data assembled by EPA to create their 111(d) building blocks.
- You can adjust fossil unit capacity factors, renewable energy and energy efficiency projections, unit retirements, and 111(b) unit additions for each state. You can compare the differences in generation, capacity, emissions, emission rates, and costs between their created scenarios and the EPA base case.
- Users may analyze a single state or a combination of states
- CP3T is released as a free, open-source model using a Creative Commons "share" and "adapt" license. This allows anyone to obtain a copy of CP3T and use it within the framework and caveats Synapse provides.
- CP3T is available at www.synapse-energy.com/cp3t or www.cp3t.com

CP3T Schematic



CP3T Multi-state Walkthrough

Combinations vs. Scenarios

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Combination:
Grouping of states

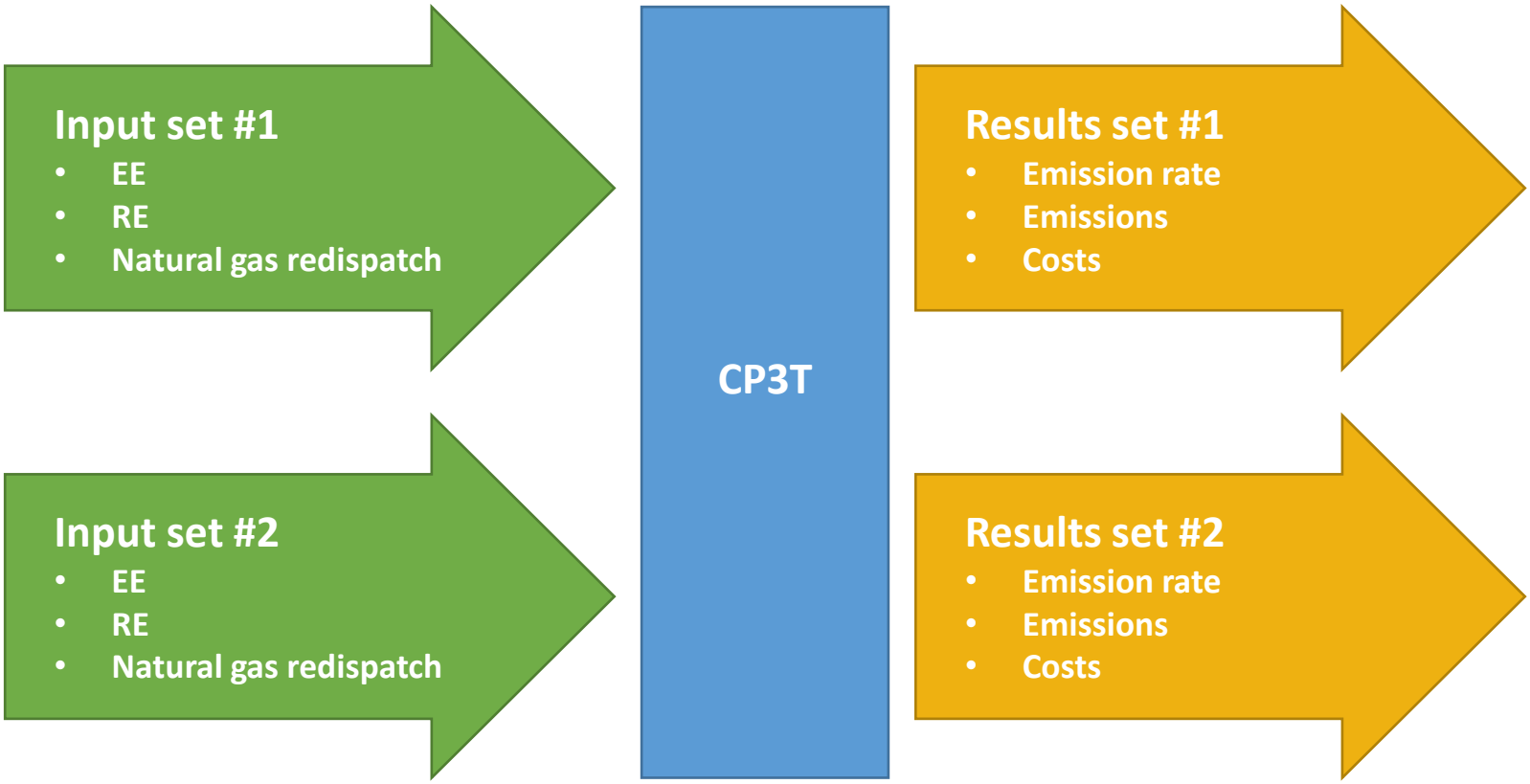
- Examples of combinations might be…
  - California and Nevada
  - PacifiCorp states
  - Illinois and Missouri
  - RGGI states

Scenario:
Approach to compliance

- Examples of approaches might be…
  - New NGCC construction
  - High levels of energy efficiency
  - Bundled or unbundled REC purchases (pairing with a state that has high renewable potential)

Scenario Analysis

- Strength of CP3T is its ability to easily set up different scenarios
- These allow you to compare the impact on results of choosing different inputs



Thoughts for discussion

- There are many different issues to consider when thinking about multi-state compliance – some specific to a set of states, some applicable to all combinations
- Scenario analysis allows you to quickly understand the implications of one plan versus another
- It allows you to make subtle or significant tweaks to your inputs and evaluate the impact on emission rates and emissions
- It allows you to understand and find possible “least cost” approaches to compliance
- Choosing rate-based or mass-based compliance affects which scenarios are least-cost
- Changes to final targets could have big impacts on current scenarios
- Actual system performance could affect plans significantly

Questions?

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Next Steps

Milestone	Description
April 8: April stakeholder meeting in Dallas, 10am-3pm CDT	Discussion on Multi-state Modeling memo and draft Best Practices report
May 6: May stakeholder meeting in Portland, 9am-2pm PDT	Discussion on draft Multi-state Modeling report and final Best Practices report
June 7: 2015 Mid-Year NASUCA Meeting	Multi-state Modeling Discussion panel
June 9: 2015 Mid-Year NASUCA Meeting	Second draft Multi-state Modeling report presentation
July 12-15	Present reports at NARUC meeting