Clean Power Plan Final Rule and State Plan Options

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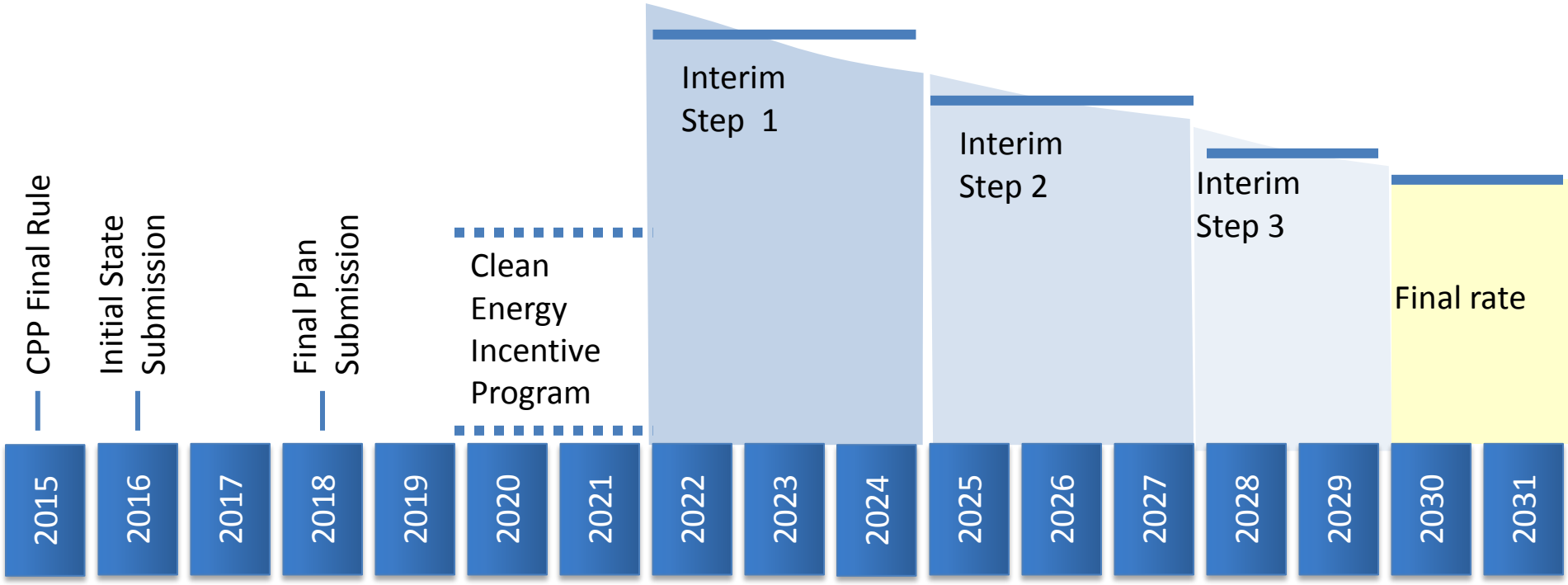
Key Takeaways & Major Changes

- Change in compliance timeline, interim begins 2022
- BSER building blocks applied to interconnections to create category specific performance rates for fossil steam units and NGCC
- EPA also provides alternative blended state rate, mass-based limits for affected EGUs and affected EGUs + new
- Rates and mass limits have changed
- Modified compliance options, embrace of trading-ready
  - Mass-based plans must address risk of leakage
  - New rate-based compliance instrument: ERCs

CPP Compliance Timeline



- EPA is encouraging early action in 2020-2021
- Interim compliance period pushed back 2 years to 2022
- Three interim steps
- Two year compliance periods for final goal

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BSER Building Blocks

BB1: Heat rate improvements at existing coal units

- Eastern 4.3%, Western 2.1%, ERCOT 2.3%

BB2: Substituting NGCC generation for higher emitting fossil steam (mostly coal) generation

BB3: Incremental renewable energy to displace fossil generation

No nuclear or energy efficiency in building blocks; they *can* be used for compliance

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Category Specific Emission Performance Rates

BSER applied on interconnection basis

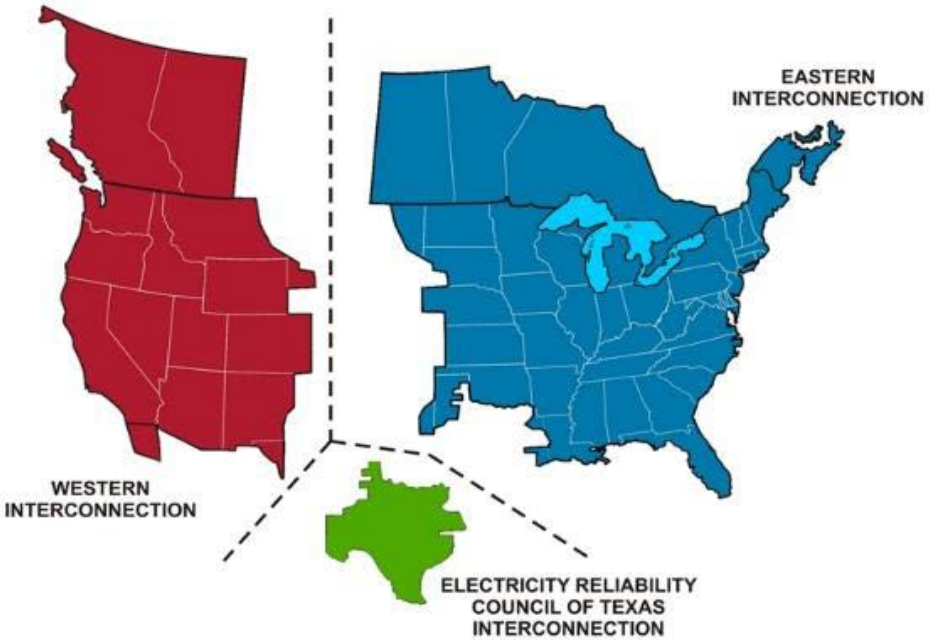
→ Select least stringent

2030 Final rate	Fossil steam	NGCC
	lbs/MWh	lbs/MWh
Eastern	**1305**	**771**
Western	*360*	*690*
ERCOT	*237*	*697*

- Same across states

Alternative blended rate

- Based on generation mix
- No longer using state/region specific assumptions about emissions reduction



Source: https://www.e-education.psu.edu/drupal6/files/geog469/images/NERC_Interconnection_1A.jpg

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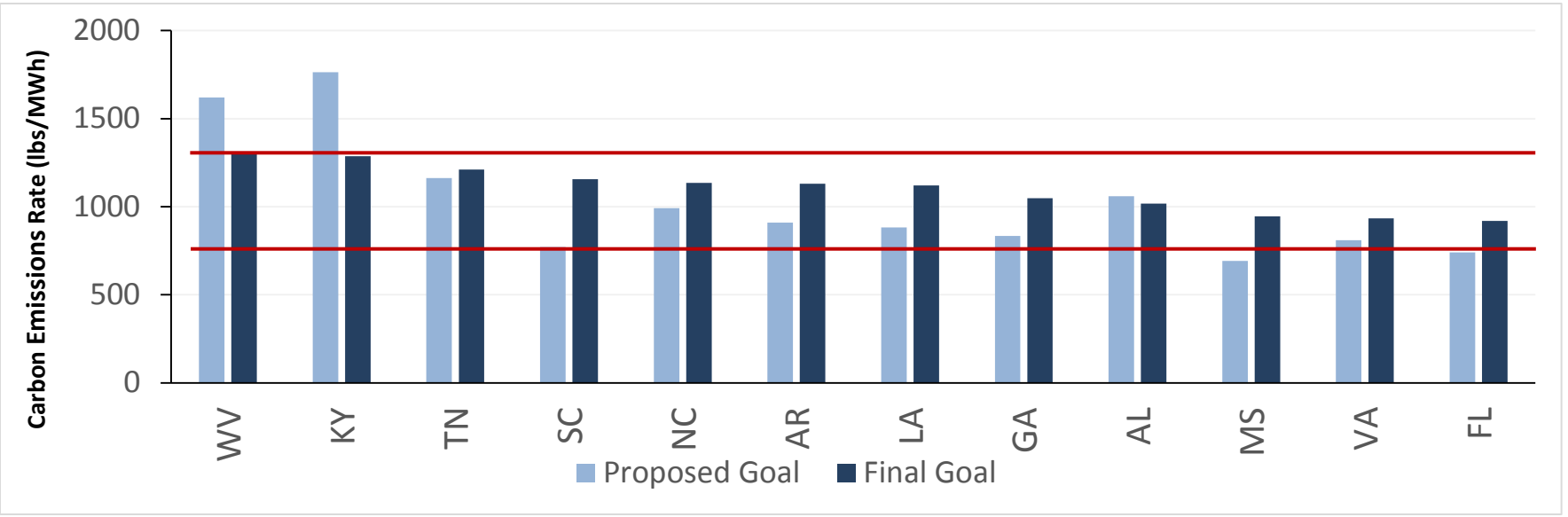
Decreased Variability Between States

(Southeast states blended rate comparison)



- The final rate goals are much less variable across the country compared to the proposal
- 31 states have less stringent targets (16 have more stringent targets) compared to the proposal

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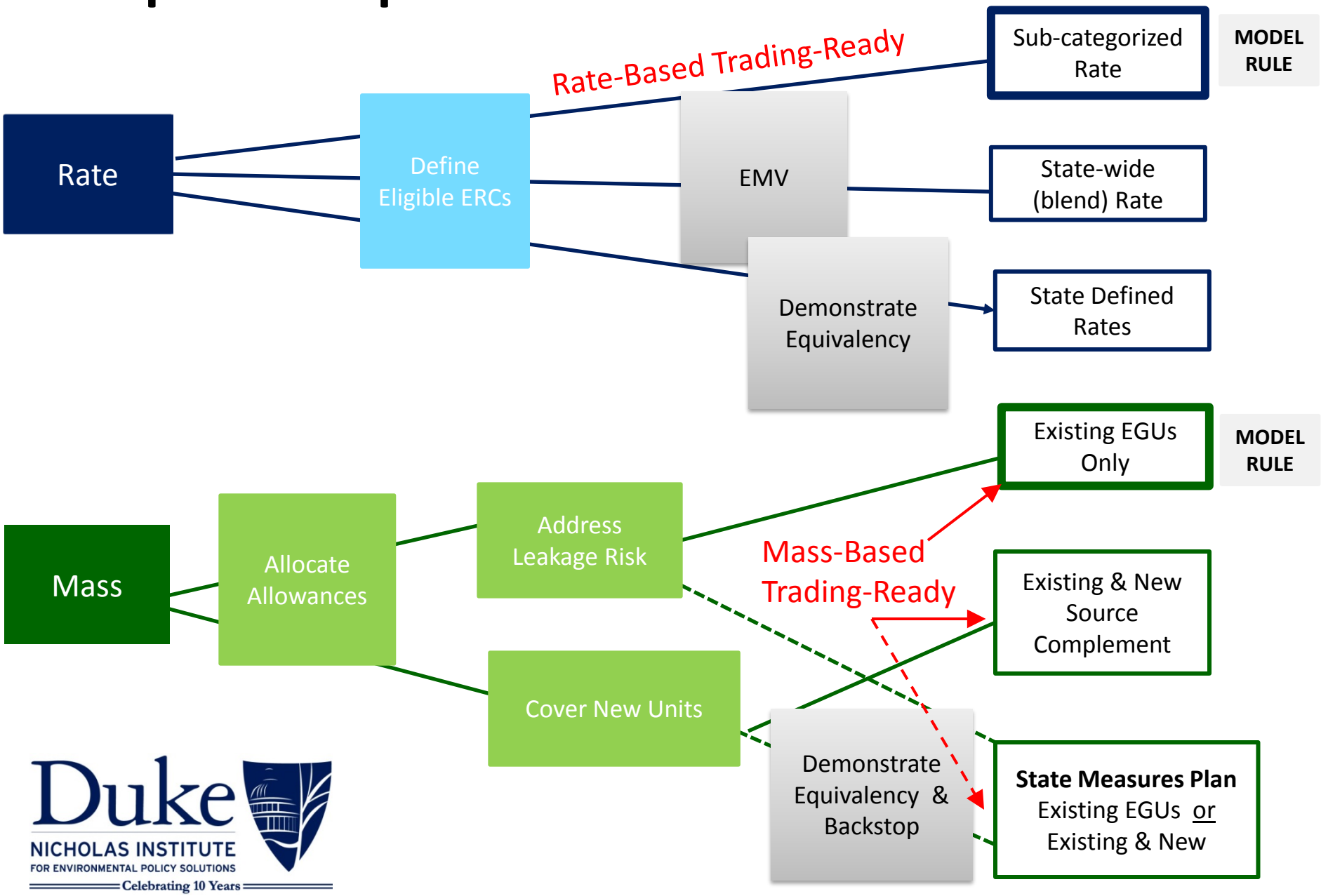
Source: EPA Data File Goal Computation Appendix 1-5.

Compliance Options Overview



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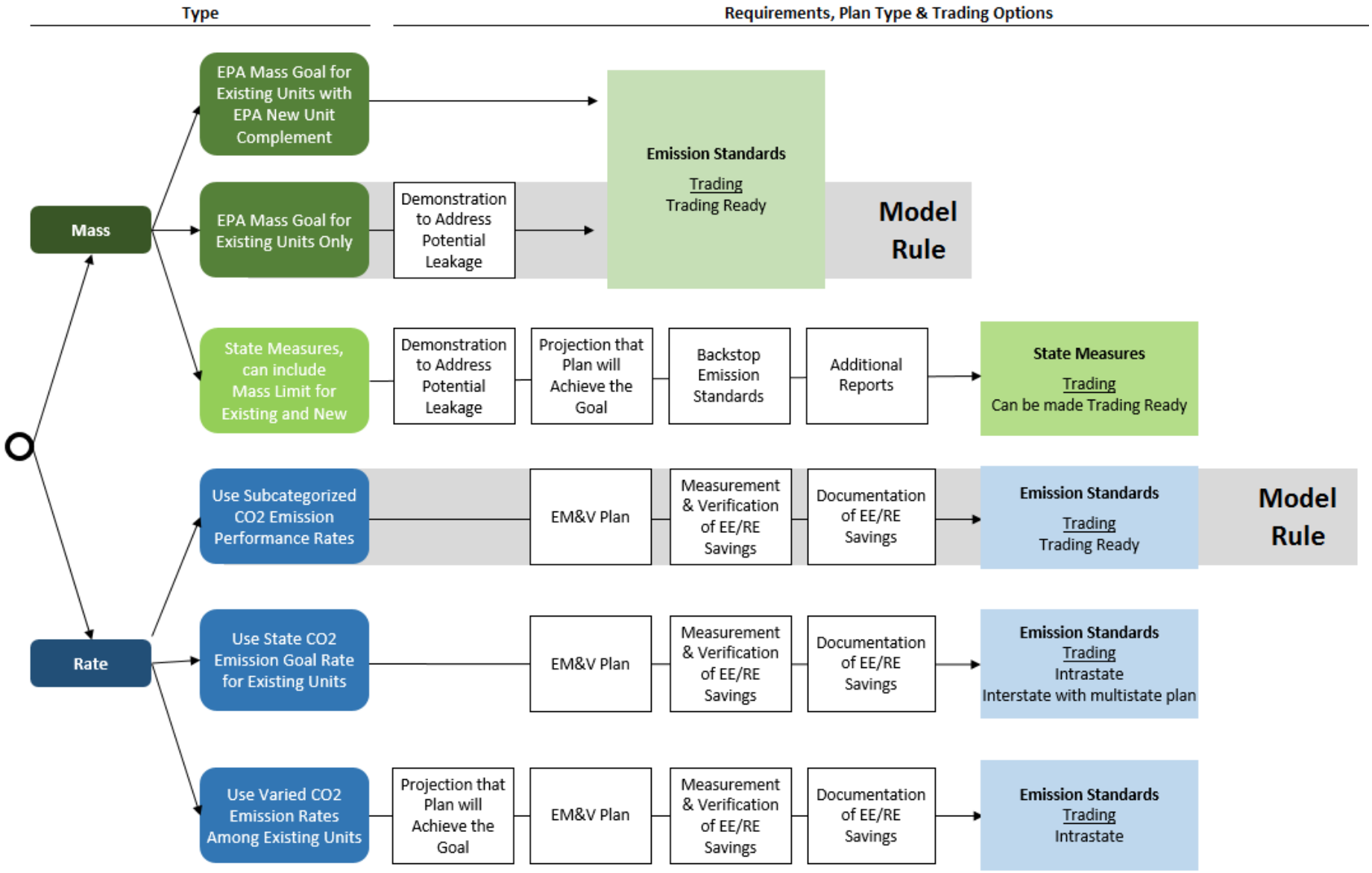
EPA's MAPPING OF THE STATE PLAN APPROACH OPTIONS



Rate-Based Plan Basics

- Compliance instrument: Emission Rate Credit (ERC)
- 1 ERC = 1 MWh of emissions-free generation added to the denominator
- ERCs are what affected units above their regulated rate turn into air regulator for compliance

$$regulated\ rate \geq \frac{(unit\ annual\ emissions)}{(unit\ annual\ gen + ERCs\ as\ needed)}$$

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Rate-Based Plan Basics

- ERC-eligible resources:
  - qualifying renewables & energy efficiency
  - New and uprated nuclear
  - Affected units operating below their rate goal
    - Sub-category specific rate *or* state blended rate
  - Gas Shift-ERCs for NGCC generation (sub-category performance rates *only*)

- Requires process: must do EM&V for RE generation, EE savings

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Rate-Based Plan Details

Sub-category specific performance rates	State-wide (blended) rate

• Coal and oil and gas steam units comply with fossil steam rate (e.g. final rate 1305 lbs/MWh)
• NGCC comply with NGCC rate (e.g. final rate 771 lbs/MWh)
• Must include mechanism to create Gas Shift ERCs (GS-ERCs)
  • Model rule GS-ERC equation
  • Only for fossil steam compliance
• Trading Ready
	• All covered units comply state blended rate target (GA final blended rate 1049 lbs/MWh)
	• GS-ERCs do not exist
	• Not trading ready
	• Multistate plans okay

Mass-Based Plan Basics

EPA calculates mass-based goal for existing sources

- New method

New source complement

Compliance instrument: allowance to emit 1 short ton of CO2

New wrinkle: Mass-based plans need to demonstrate they have addressed the risk of leakage to new sources in state plan

3 options available to states

- Include new units under mass limits with new source complement
- Use an allocation method that counteracts leakage
- Other methods demonstrated by state to prevent leakage

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Mass-Based Plans and Leakage

What is leakage: incentive to shift generation to new sources beyond what would occur using sub-category specific performance rates

3 options available to states

- Include new units under mass limits with new source complement
- Use an allocation method that counteracts leakage
  - Model rule: output based allocation set-aside to incentivize existing NGCC & RE set-aside to encourage RE generation
- Other methods demonstrated by state to prevent leakage
  - 'credible analysis' demonstrating state plan or circumstances make leakage unlikely

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Mass-Based Allowance Allocation

What is a set-aside: allocating allowances for a specific purpose

- Output based set-aside
- RE set-aside
- CEIP set-aside

What is output based allocation: updating allocation mechanism that awards allowances to eligible sources based on generation

- Output based allocation model rule: to existing NGCC
- Creates incentive for generation

Otherwise EPA is flexible on allowance allocation

- e.g. grandfathering (historical generation, emissions), auction, give to Load Serving Entities and more

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Trading-Ready State Plan Basics

What is "Trading Ready"?

Allows EGUs and others to trade compliance instruments **with the same definition** with entities in other states without a formal multistate agreement.

Mass	Rate
Allowance representing 1 short ton of CO_2 emissions	Emission Rate Credit (ERC) representing 1 MWh of zero carbon generation or avoided emissions

*Mass can trade with mass and rate with rate.

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Trading Ready State Plan Basics

Trading-Ready Plans must:

- Use mass or subcategorized rate
- Submit as trading-ready
- Use linked or common tracking system
  - Can use EPA's Allowance Tracking & Compliance System (ATCS)

State flexibility:

- Can limit trading partners, turn trading on or off by updating plan
- No plan modification if other states move in and out of trading ready

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Proposed Model Rules & Federal Plan(s)

Mass

- Existing Units Only
- Set-asides to address risk of leakage to new NGCC
- Trading-ready

Rate

- Sub-Category Specific Rates
- Trading ready

Federal Plan: If fail to submit or EPA deems inadequate

- Similar to model rules
- Do not know if a state with a federal plan would be mass or rate

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Zero-Emitting ERCs

Federal Plan proposal*

- On-shore utility scale wind
- Utility scale solar PV
- Concentrated solar
- Geothermal power
- New/uprate nuclear
- Utility scale hydro

Model Rule proposal

- All wind
- All solar (including distributed)
- Geothermal
- Hydropower
- Qualified biomass
- Wave
- Tidal
- Waste-to-energy
- New/uprate nuclear
- Non-affected combined heat and power
- Demand-side energy efficiency/ demand-side management

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Thank you

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