Achieving State Policy Goals in Markets

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NECPUC Annual Meeting
June 5, 2017

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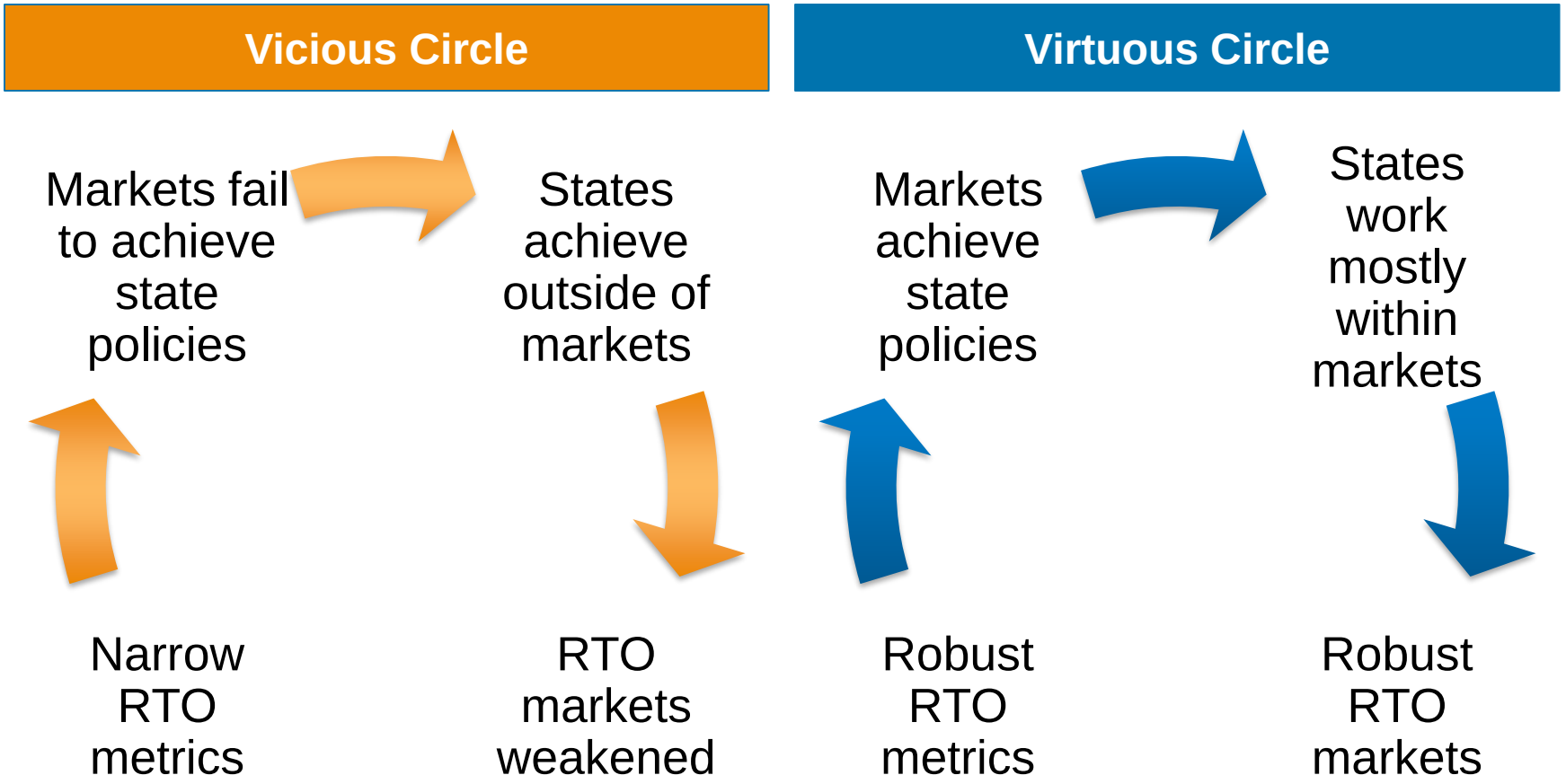
Disconnects between RTO markets and state policy goals

- RTO markets are *narrowly* efficient
  - Achieve reliability goals
  - At least cost
- Disconnect when state policies have:
  - Broader goals
  - Broader cost metrics
- Many goals have been brought into the markets by pricing
  - SO_2, NO_X attainment
- But mixed success with other goals
  - RECs to attain RPS
  - RGGI to attain CO_2 goals

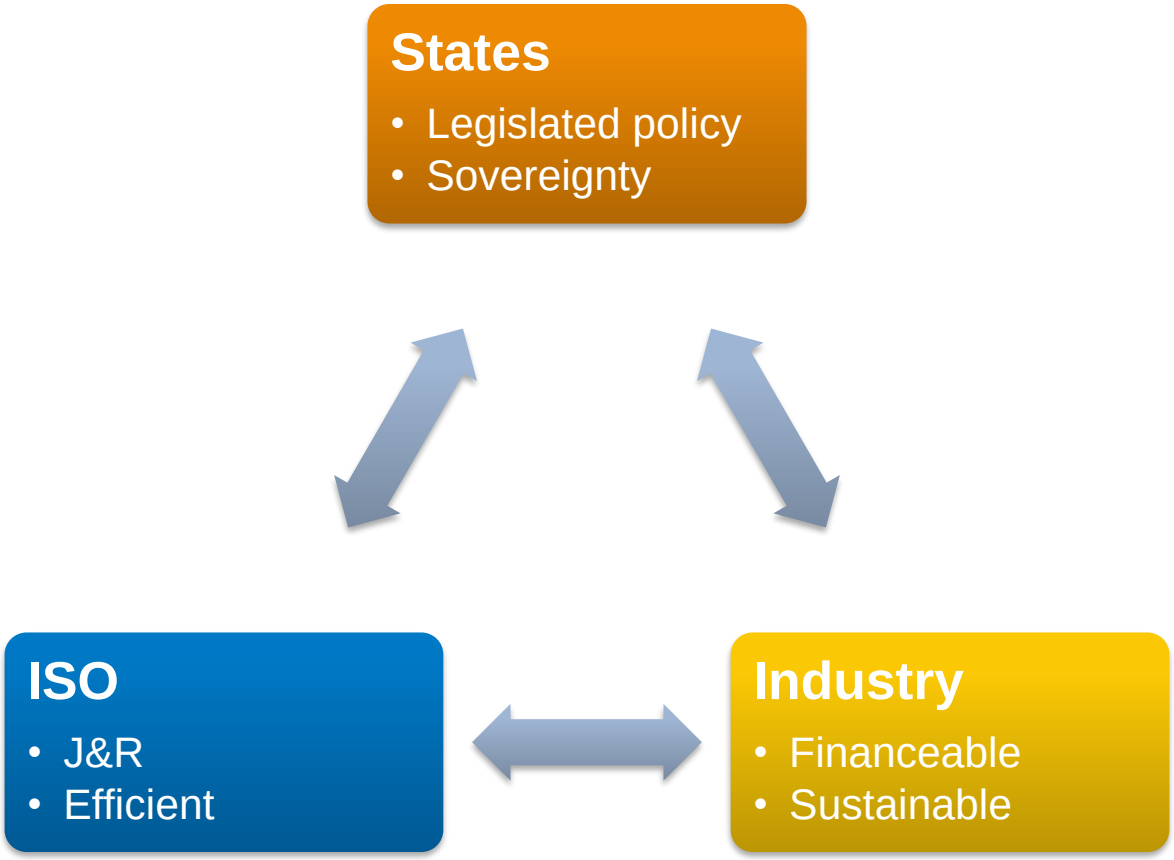
What's gone amiss with market-based GHG achievement?

- Pricing can be too low to achieve policy
  - RGGI prices set by markets, but markets not calibrated to policy
- Market structure inadequate to support investment, e.g. RECs
  - Value depends on policies subject to year-to-year change
  - Fragmented, state-by-state demand
  - Poor basis for long-term capital financing
- Result: direct state action
  - To hold nukes (e.g. ZECs)
  - To procure renewables (e.g. MA 1,200 MW RFP)

Achieving state policies is critical to market health



Achieving State Policy in Markets
Personae Dramatis in constrained policy space



Design advanced by CLF, NextEra and Brookfield after extensive consultation with state and ISO-NE officials

Numerous proposals for achieving state policy

- Carbon adder in dispatch
- Forward market for clean energy
- Clean energy targets as side constraint in capacity market
- Time-dependent RECs (peak/off-peak)

Goals of Dynamic Clean Energy Market (DCEM) design

- Provide states new tool for achieving policy goals that:
  - Uses centralized markets
  - Achieves policies at least cost
  - Attracts and retains cost-effective resources
  - Creates visible, competitive prices
  - Fosters broad participation of innovative technologies & resources
  - Meets most, if not all, state requirements for clean energy

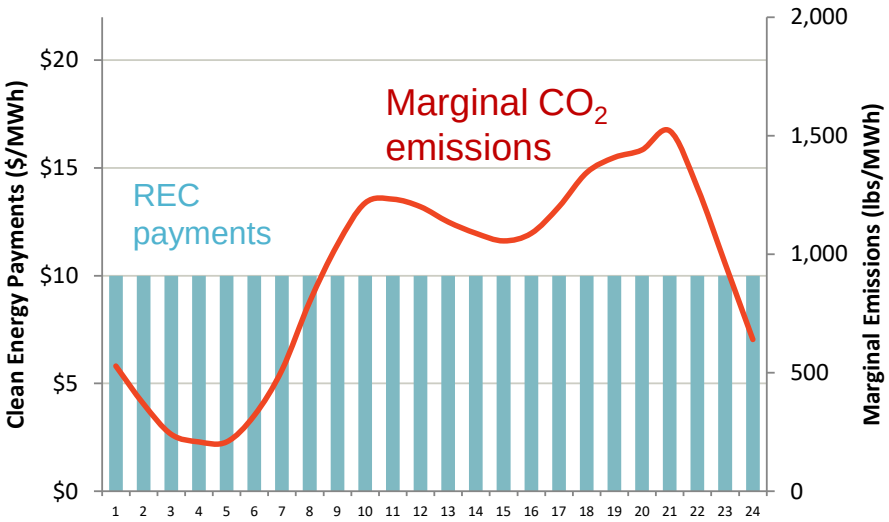
DCEM Design Concept

- Auction procures the clean energy attribute only
  - Clears MWh quantities of Carbon-Linked Incentives to Policy Resources (CLIPR)
- Products:
  - Base product: generic zero-emitting MWh, new and existing
  - Premium product(s): as required to implement specific state policy
- States or their agents provide demand bids (price & quantity)
  - Cleared quantities must be reoffered for additional nine years
- Auction closely precedes base capacity auction
  - Expected clean energy revenues are “in market” for MOPR
- New CLIPR improves on existing REC products:
  - Consistent definition across region (for “base” product)
  - Link hourly payment to carbon reduction
  - Potential for multi-year contract for new resources

DCEM mimics carbon price for policy resources

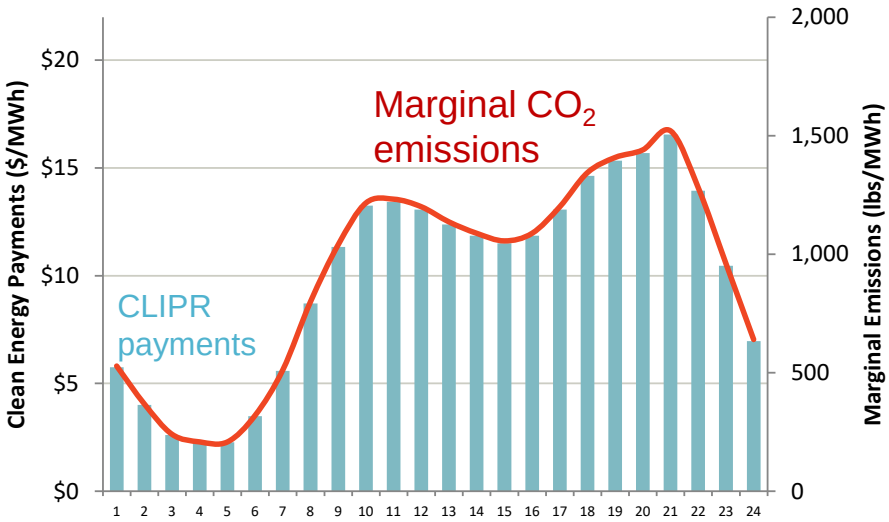
CLIPR refines traditional REC payment

Illustrative REC payments



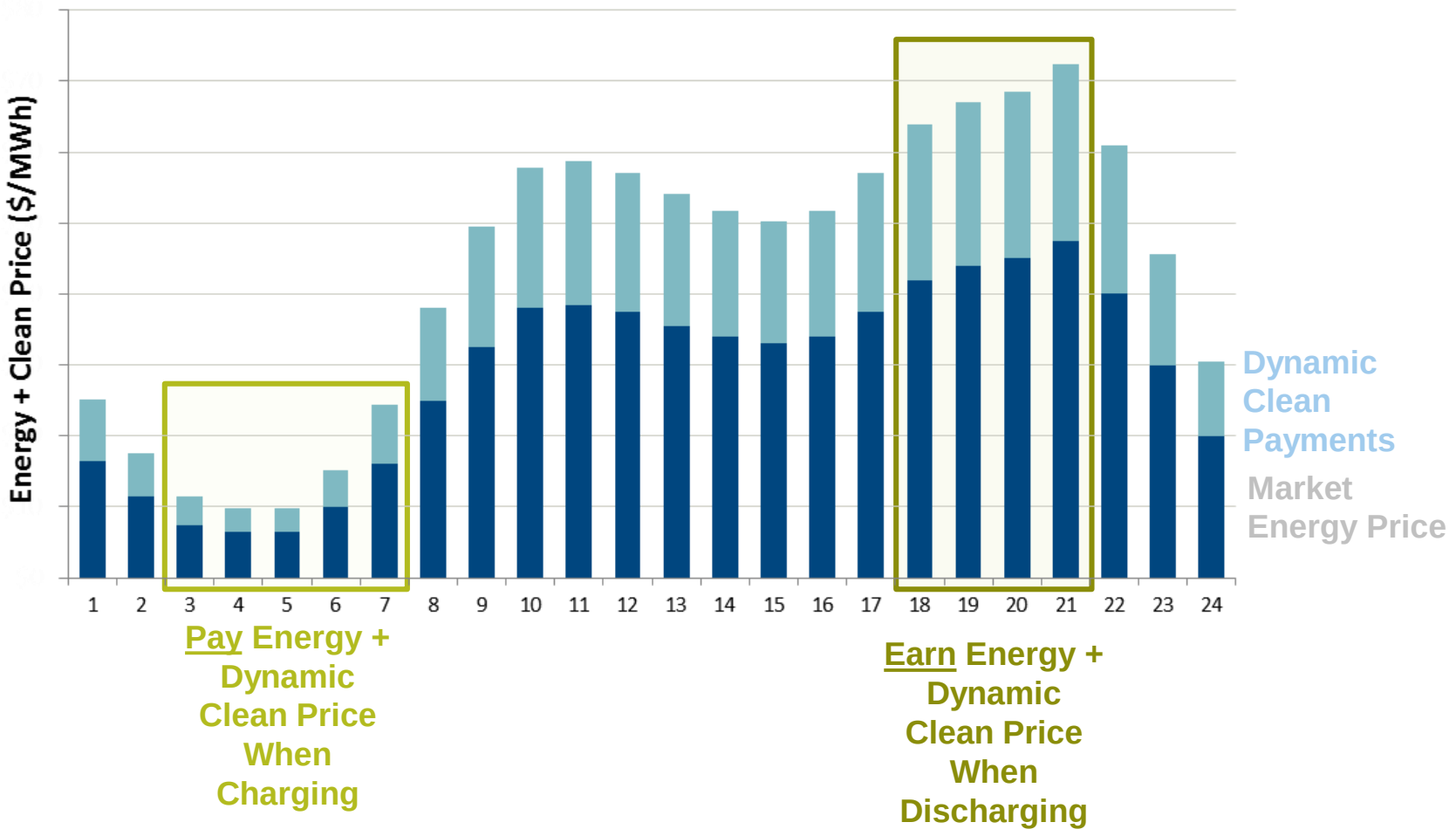
- Flat payments in every hour
- Added incentive to offer negative energy prices, even during periods with excess energy

Illustrative CLIPR payments



- Payments scale in proportion to CO_2 emissions of marginal energy units
- Incentive to produce clean energy **when** and **where** it avoids the most CO_2 emissions
- No added incentive to offer at negative prices

Different CLIPR payments enhance opportunities for storage



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Meeting the needs of differently situated states

States with Strong Decarbonization Goals

- Market-based opportunity to purchase clean resources to meet goals
- Flexibility to define needs
- Avoid need for one-off negotiations and specialized contracts
- Reduced administrative burden for states
- Procured resources participate fully in RTO markets
  - Avoids paying twice for capacity
  - Avoids disrupting price formation in energy and capacity markets
- Sustainable revenue source to cost-effective clean energy resources eliminates need for “rescue missions”
- Better allocation of risk:
  - Commodity risk to developers
  - Regulatory risk to consumers

Non-Participating States

- Will not pay for costs of clean energy purchases of other states
- Will benefit from lower energy (and possibly capacity) prices from presence of policy resources

DCEM compared to carbon pricing

DCEM

- Market-set price to meet *quantity* targets determined by states
- Benefits targeted narrowly on policy resources
  - Limited cost impact, but
  - Excludes some cost-effective carbon reduction, e.g. DR & EE
  - No impact on dispatch stack
- Potential multi-year commitment aids financing
- Initial interest from state commissions

Carbon Pricing

- Price set administratively in a FERC-approved tariff
- Broad impact on markets achieves carbon reduction most efficiently
  - Higher net consumer cost
  - Benefits flow also to low-emission units, demand-side, behind-the-meter gen
  - Reorders supply stack (with multiple fuels)
- Risk of price decreases raises financing Qs
- States unanimously oppose carbon pricing in federal tariff

DCEM compared to Forward Clean Energy Market

DCEM

- Attribute-only
  - Not necessarily a federal market
- Payment varies proportional to emissions displaced
  - Keeps renewables responsive to energy market prices
- Split risk sharing:
  - Developer carries energy commodity & operational
  - Consumers carry policy risk

FCEM

- Energy + attribute
  - FERC jurisdictional
- Fixed payment rate
  - Removes renewables from energy market
- Developers carry less risk:
  - Developers have operational risks
  - Consumers carry energy & policy risk

Next steps for Dynamic Clean Energy Market

- Technical evaluation by states' consultant
- Further development by IMAPP sub-groups
- Tariff development by Markets Committee