Clean Energy Markets
THE “MISSING LINK” TO MARKET DESIGN 3.0

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Hypothesis:

Competitive Clean Energy Markets Are the “Missing Link” in the Evolution to Market Design 3.0

*Image Source: openclipart.org “evolution steps”*
Cleaner Energy Development Is Rapidly Overtaking Traditional Supply

- **Rapid Declines in Technology Costs**
- **State Environmental Policies**
- **Degrading Incentives for Traditional Supply**
- **Retail and C&I Demand for Green Power**
- **Innovative Business Models**

**Data Source:** Energy Velocity Suite.
States and Customers Are Going Green (With or Without Markets)

We can take one of two evolutionary paths to decarbonize the electricity sector:

- **Current Path:** Use Contracts and Policies to Override Prevailing Market Signals
  - Without intervention, markets will not decarbonize
  - States and customers bypass centralized markets to meet their goals

- **Better Path:** Use the Markets to Achieve State & Customer Goals
  - **Carbon Pricing:** “First best” economic solution (economy-wide, no regulatory risk). Most feasible with a single jurisdictional authority
  - **Clean Energy Markets:** Most adaptable to differences in state policies and customer demand
The disconnect between what customers want and what the markets deliver will continue to grow...

Out-of-market payments will dominate the customer bill. Costs are exacerbated when policy & market signals work at cross-purposes.

Markets will have a diminishing relevance. Customers will lose most of the benefits offered by competitive markets.
But There’s a Better Path to “Markets 3.0”

Clean energy attribute markets are the primary “missing link” needed to better align markets with customer and state demand for a cleaner grid.

- Competitive clean attribute markets can harness competition and innovation to decarbonize faster and cheaper.
- Suite of unbundled markets work together to meet both reliability and policy needs at the lowest combined cost.

- Energy Market
  Possibly with enhanced carbon pricing

- Capacity Market

- Regional Clean Attribute Markets

- Contracts & Directed Payments
What Should the Clean Energy Markets Look Like?

Best practices are the same, whether the leadership to develop clean energy markets comes from state policymakers, market operators, or others:

- **Product Definition** that matches the underlying objective (carbon abatement)
- **Unbundled Attributes** that maximize competition across markets and technologies
- **States and Customers Choose** their own demand quantities and willingness to pay (no costs shifted to non-participants)
- **Technology-neutral** qualification and payments
- **Broad regional competition**
- **Mechanisms to mitigate regulatory risk** and ensure financeability at competitive costs
- **Care to ensure alignment with energy, ancillary, and capacity markets**
Better Product Definition: Achieves Faster Decarbonization at a Lower Cost

Our proposal for a “Dynamic” Clean Energy Market in New England would align payments with marginal carbon abatement

**Illustrative Traditional REC Payments**
- Flat payments over every hour
- Incentive to offer at negative energy prices during excess energy hours

**Illustrative “Dynamic” Clean Payments**
- Payments scale in proportion to marginal CO₂ emissions (by time and location)
- Incentive to produce clean energy when and where it avoids the most CO₂ emissions
- No incentive to offer at negative prices

Sources and Notes:
Enabling Competition: Lets Innovative Players Identify Creative Solutions

Dynamic payments incentivize clean energy at the right times to displace the most CO₂ emissions, enabling storage to compete with other technologies.

Storage Participation for Dynamic Clean Payments

- Pay Energy + Dynamic Clean Price When Charging
- Earn Energy + Dynamic Clean Price When Discharging
Takeaways

Competitive regional clean energy markets are the badly-needed “missing link” in the evolution to Market Design 3.0

- Customers and states are going green, with or without the help of the wholesale markets

- On the current path, policy and markets will continue to work at cross-purposes, resulting in inflated costs to achieve carbon goals and a diminishing relevance of the wholesale markets

- A better path is to use market mechanisms to help customers and states meet their environmental objectives, harnessing competitive forces and innovative potential to achieve more and pay less
Dr. Kathleen Spees is a principal at The Brattle Group with expertise in wholesale electricity markets design and environmental policy analysis.

Dr. Kathleen Spees is a Principal at The Brattle Group with expertise in designing and analyzing wholesale electric markets and carbon policies. Dr. Spees has worked with market operators, transmission system operators, and regulators in more than a dozen jurisdictions globally to improve their market designs for capacity investments, scarcity and surplus event pricing, ancillary services, wind integration, and market seams. She has worked with U.S. and international regulators to design and evaluate policy alternatives for achieving resource adequacy, storage integration, carbon reduction, and other policy goals. For private clients, Dr. Spees provides strategic guidance, expert testimony, and analytical support in the context of regulatory proceedings, business decisions, investment due diligence, and litigation. Her work spans matters of carbon policy, environmental regulations, demand response, virtual trading, transmission rights, ancillary services, plant retirements, merchant transmission, renewables integration, hedging, and storage.

Dr. Spees earned her PhD in Engineering and Public Policy within the Carnegie Mellon Electricity Industry Center and her MS in Electrical and Computer Engineering from Carnegie Mellon University. She earned her BS in Physics and Mechanical Engineering from Iowa State University.
Our Practices and Industries

**ENERGY & UTILITIES**
- Competition & Market Manipulation
- Distributed Energy Resources
- Electric Transmission
- Electricity Market Modeling & Resource Planning
- Electrification & Growth Opportunities
- Energy Litigation
- Energy Storage
- Environmental Policy, Planning and Compliance
- Finance and Ratemaking
- Gas/Electric Coordination
- Market Design
- Natural Gas & Petroleum
- Nuclear
- Renewable & Alternative Energy

**LITIGATION**
- Accounting
- Analysis of Market Manipulation
- Antitrust/Competition
- Bankruptcy & Restructuring
- Big Data & Document Analytics
- Commercial Damages
- Environmental Litigation & Regulation
- Intellectual Property
- International Arbitration
- International Trade
- Labor & Employment
- Mergers & Acquisitions Litigation
- Product Liability
- Securities & Finance
- Tax Controversy & Transfer Pricing
- Valuation
- White Collar Investigations & Litigation

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