

Clean Energy Markets

THE “MISSING LINK” TO MARKET DESIGN 3.0

PRESENTED TO
Harvard Electricity Policy Group

PRESENTED BY
Kathleen Spees

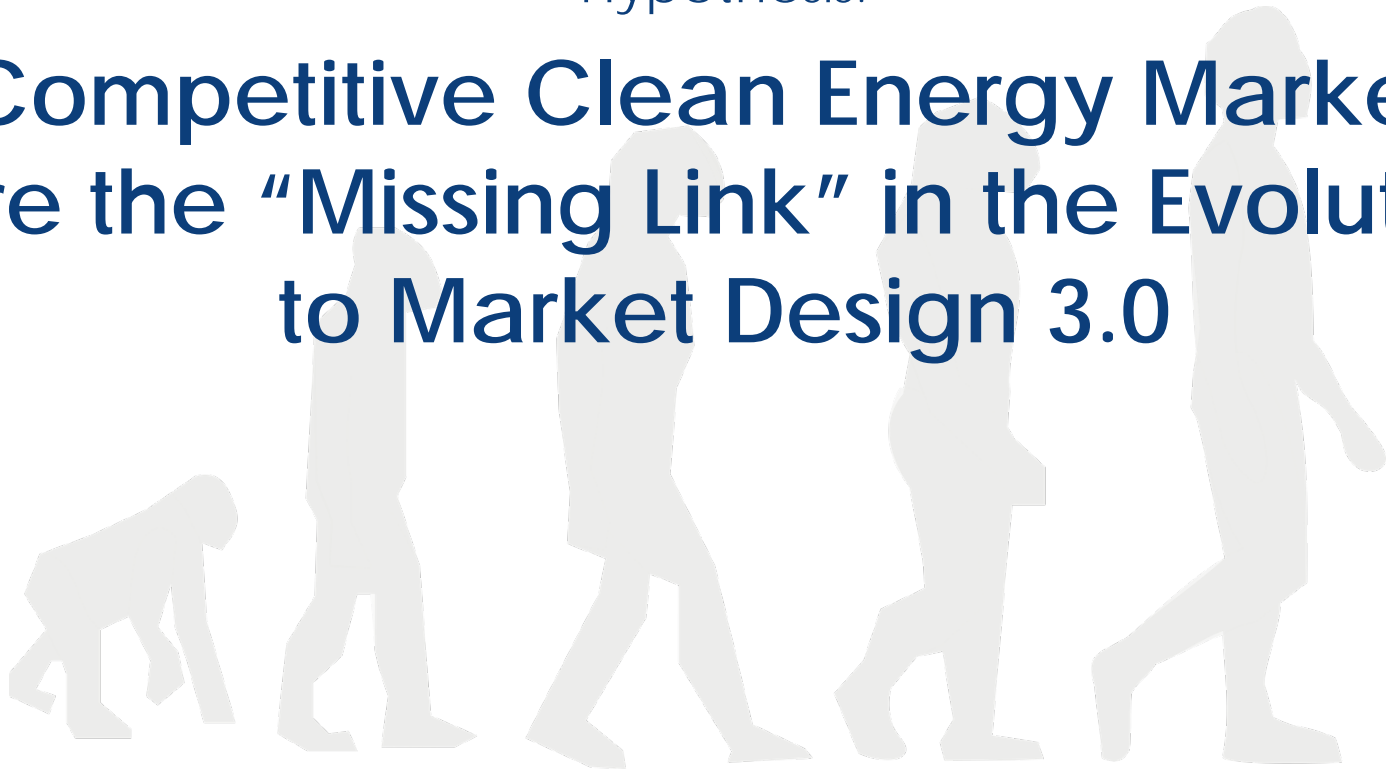
October 4, 2018

THE **Brattle** GROUP



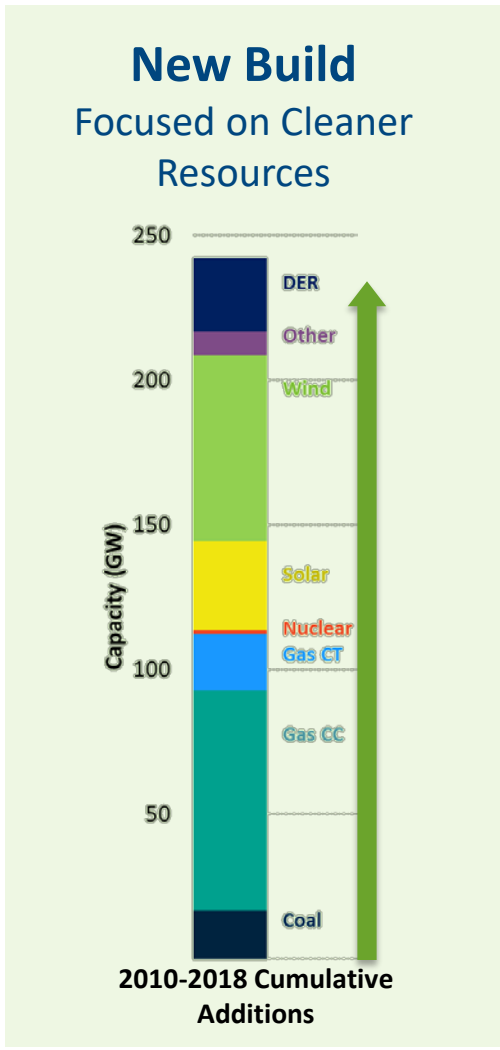
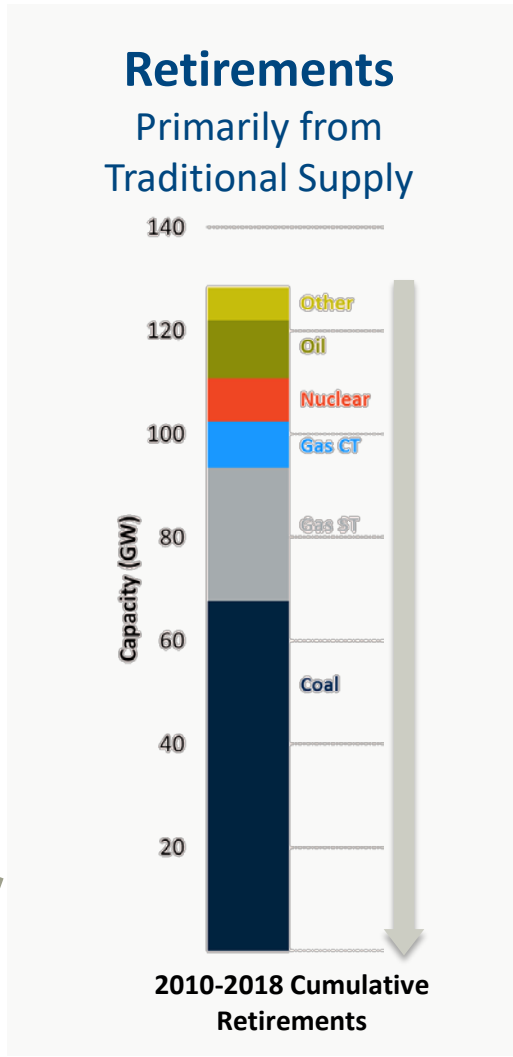
Hypothesis:

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



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

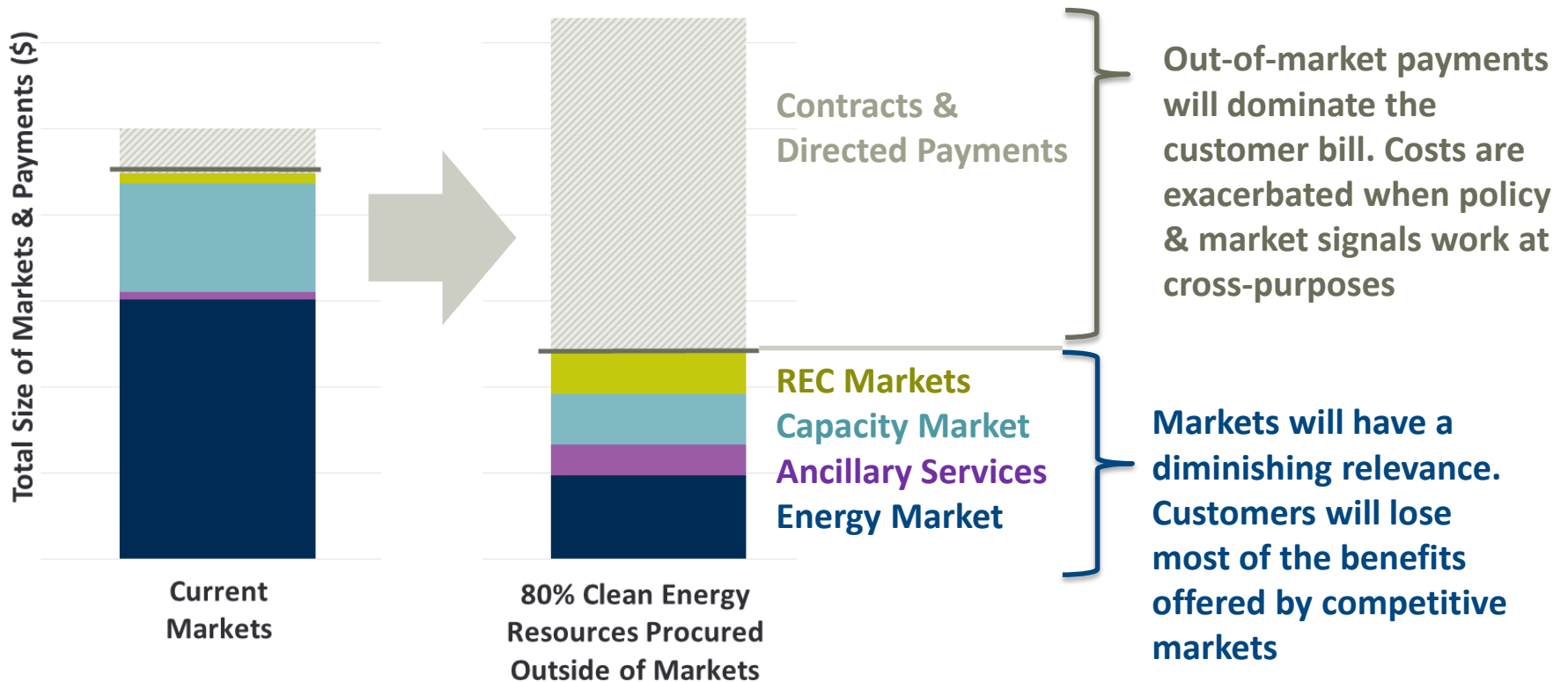
Better Path:

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

Where is the Current Path Leading?

The disconnect between what customers want and what the markets deliver will continue to grow...



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



What Should the Clean Energy Markets Look Like?

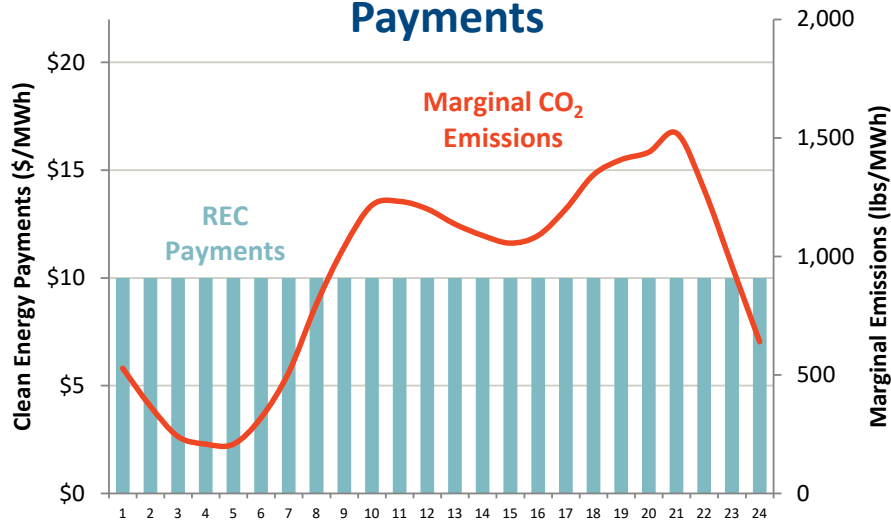
Best practices are the same, whether the leadership to develop clean energy markets comes from state policymakers, market operators, or others:

- **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

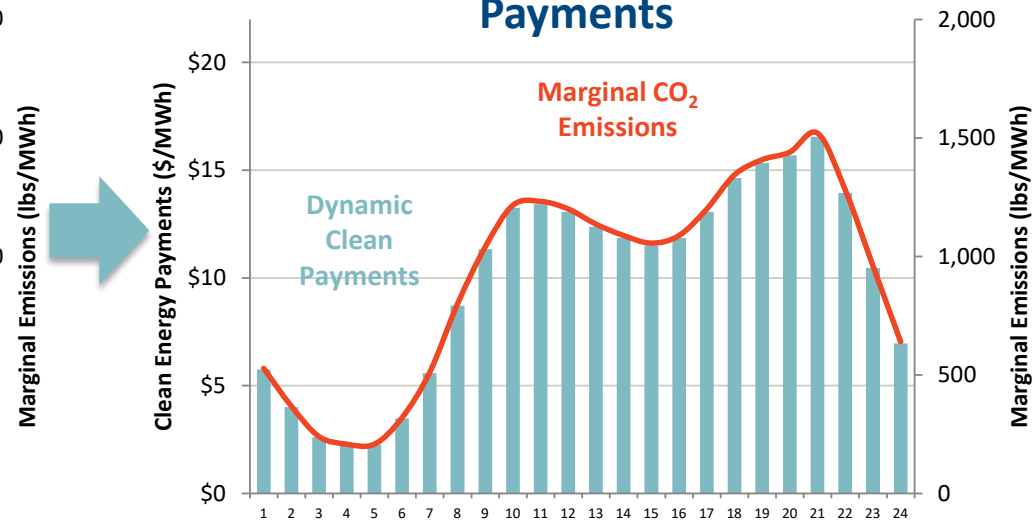
Our proposal for a “Dynamic” Clean Energy Market in New England would align payments with marginal carbon abatement

Illustrative Traditional REC Payments



- Flat payments over every hour
- Incentive to offer at negative energy prices during excess energy hours

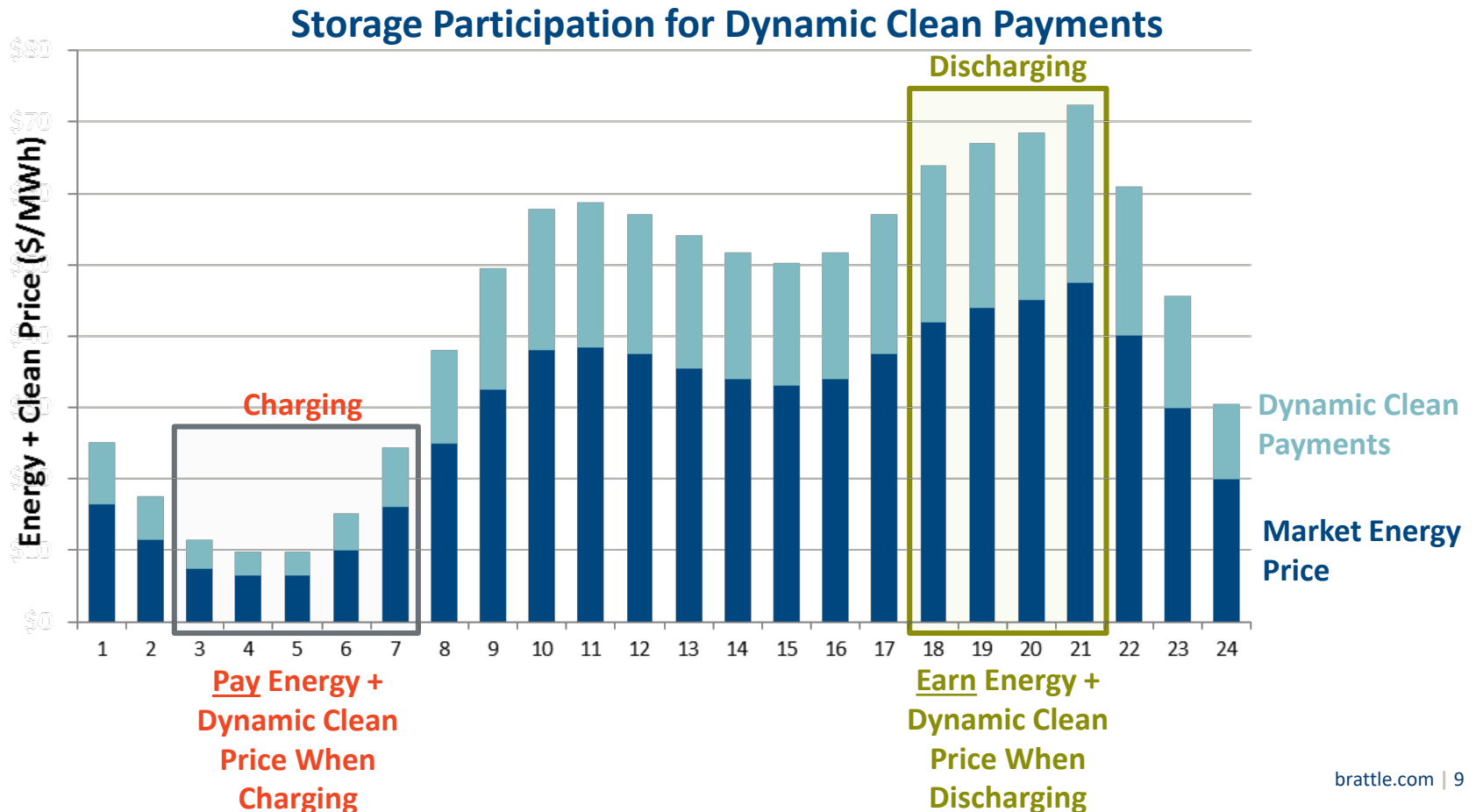
Illustrative “Dynamic” Clean Payments



- 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

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



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

PRESENTED BY

KATHLEEN SPEES

PRINCIPAL, WASHINGTON, DC

1.202.419.3390

KATHLEEN.SPEES@BRATTLE.COM



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

INDUSTRIES

Electric Power
Financial Institutions
Infrastructure
Natural Gas & Petroleum
Pharmaceuticals & Medical Devices
Telecommunications, Internet, and Media
Transportation
Water

Our Offices



BOSTON



NEW YORK



SAN FRANCISCO



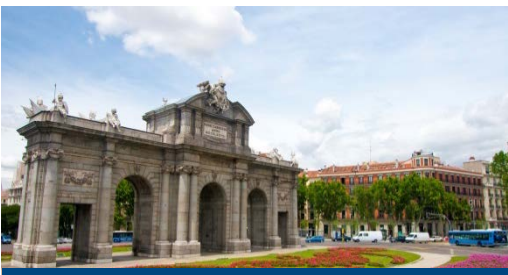
WASHINGTON



TORONTO



LONDON



MADRID



ROME



SYDNEY