



# Leveraging Environmental Market Assets in Financing Renewable Energy Projects

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# Outline

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- Purpose of Markets
- Renewable Energy Certificates
- Carbon Offsets
- Risk Mitigation
- Opportunities for Leverage



# Purpose of Environmental Markets

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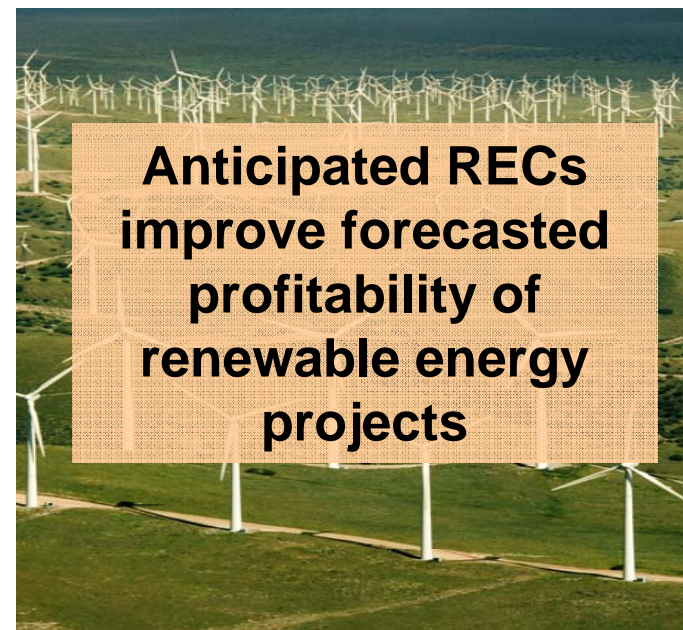
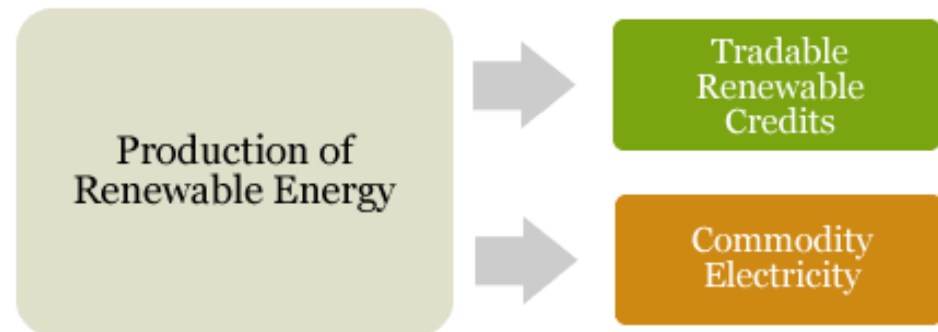
- Combat Global Warming
- Promote Renewable Energy
- Tap Success of Air Quality Markets
- Take Advantage of Variable Technologies
- Realize Efficiencies
- Reward Innovators and *Proactive Players*



# Renewable Energy Certificates (RECs)

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- Something extra to sell on top of electricity
- One REC = One mWH “premium,” earned when RE is generated
- Voluntary and mandatory markets

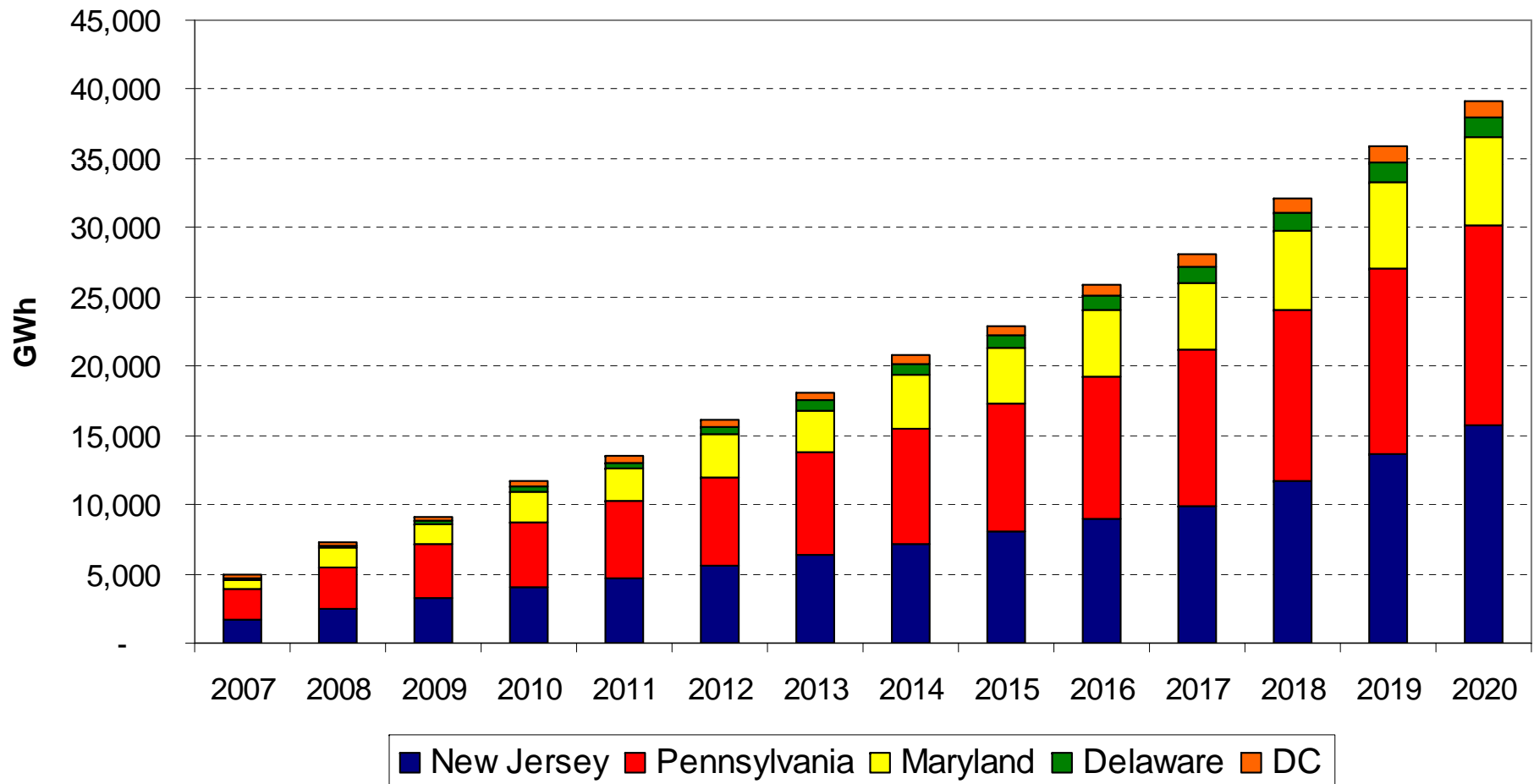




# PJM RPS Renewable Generation Demand by State

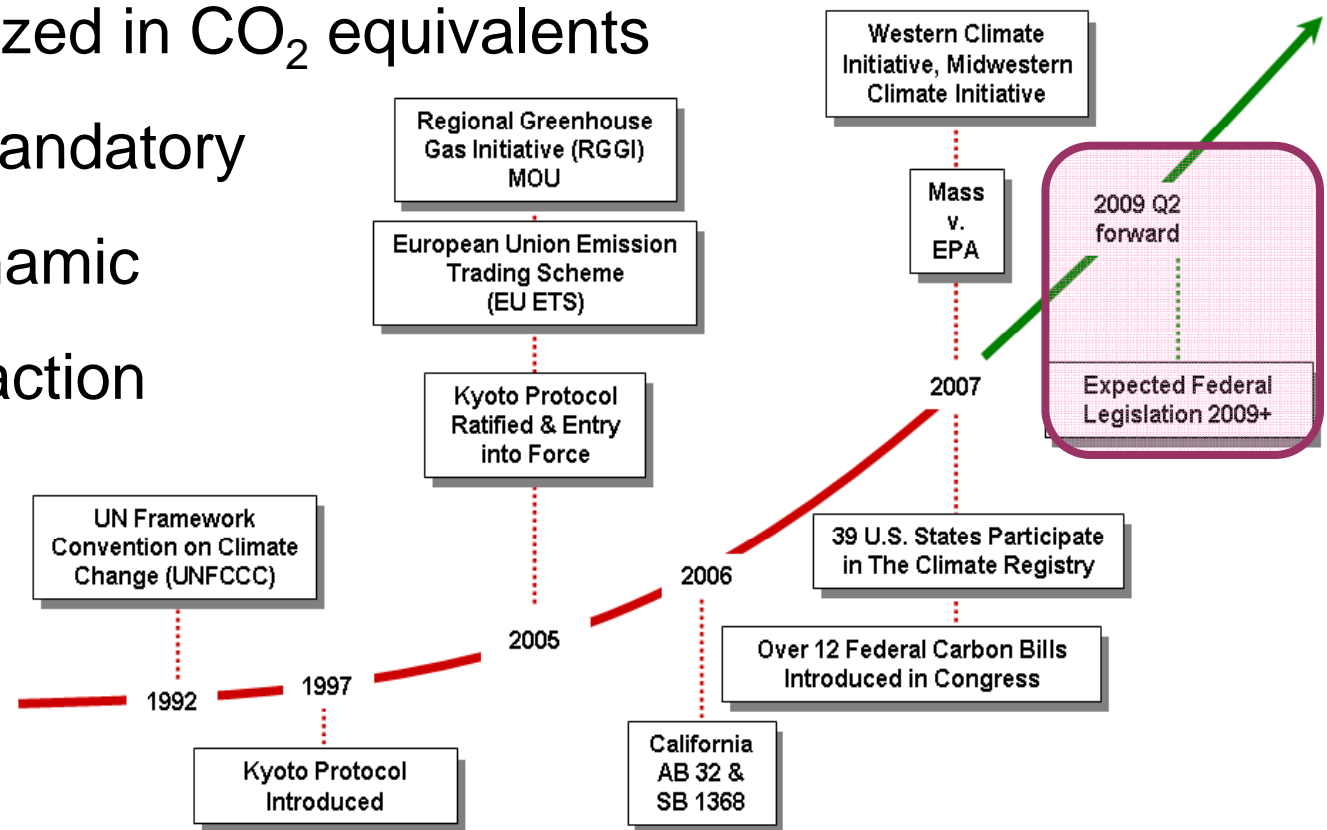
Pennsylvania: Tier I Only  
 Maryland: Tier I Only

New Jersey: Class I Only  
 DC: Tier I Only



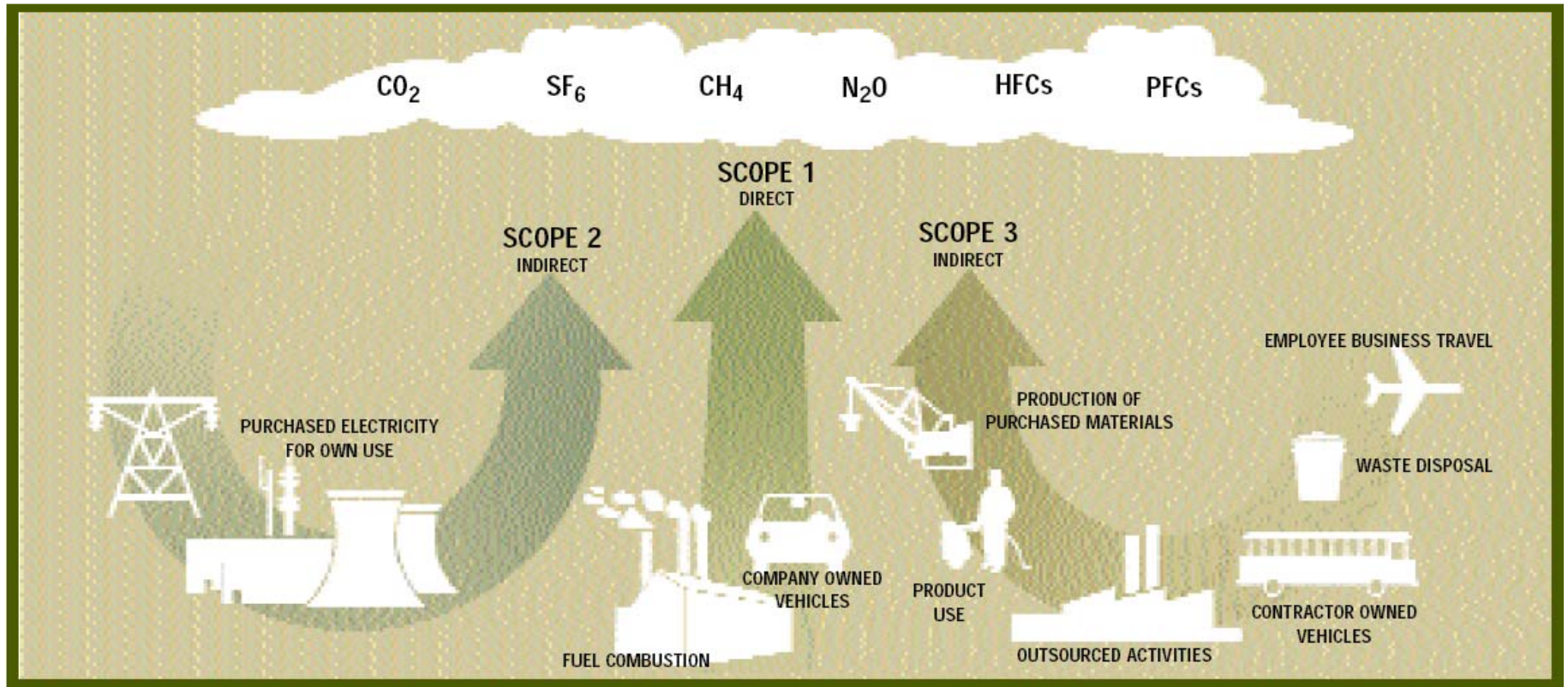
# Milestones in Developing the Carbon Markets

- Accelerating Progress
- Applies to Greenhouse Gases (GHG)
- GHGs Standardized in CO<sub>2</sub> equivalents
- Voluntary and Mandatory
- Diverse and Dynamic
- Rewarding Pro-action



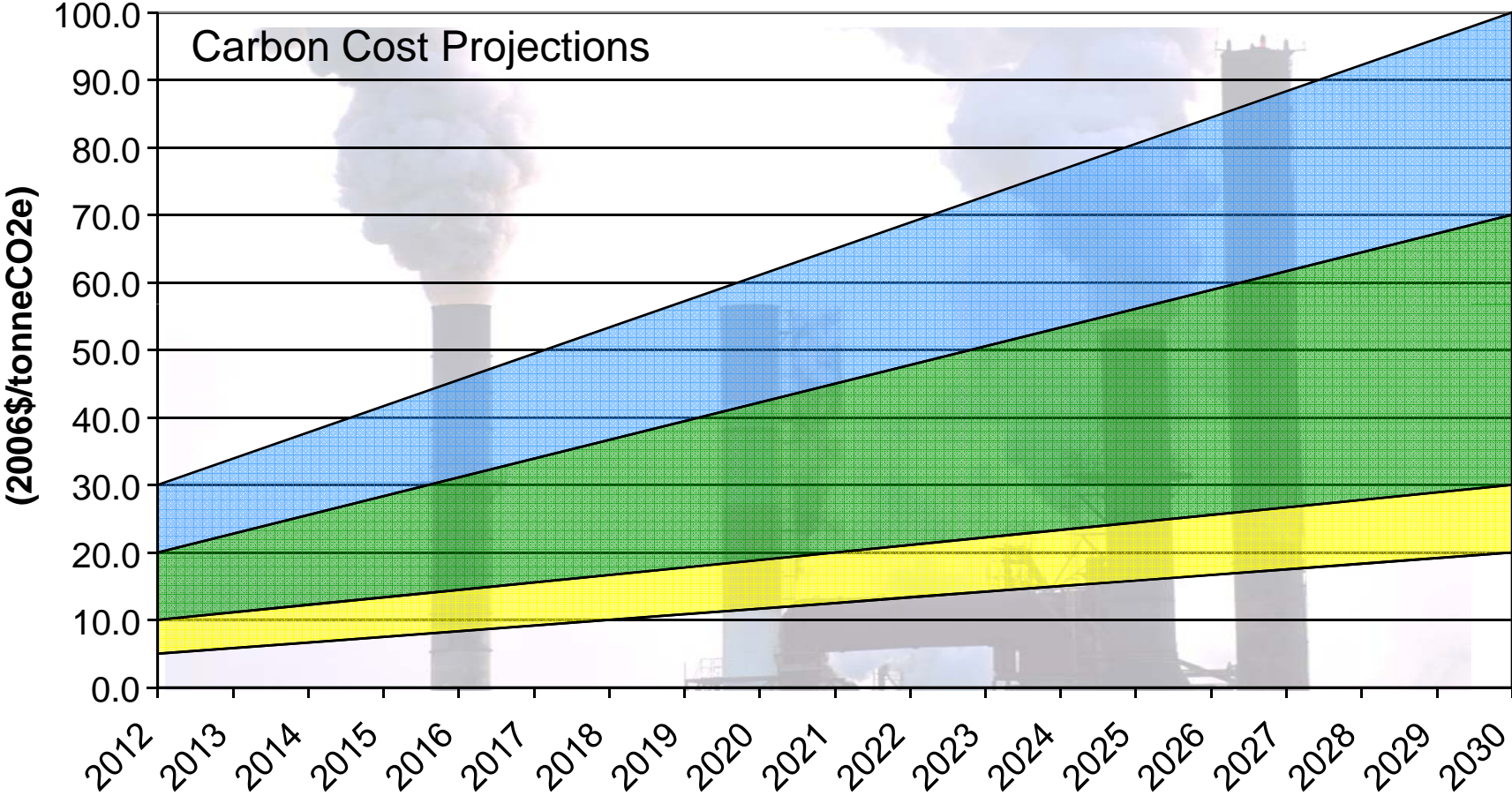


# Examples of Regulated Emissions and Categories



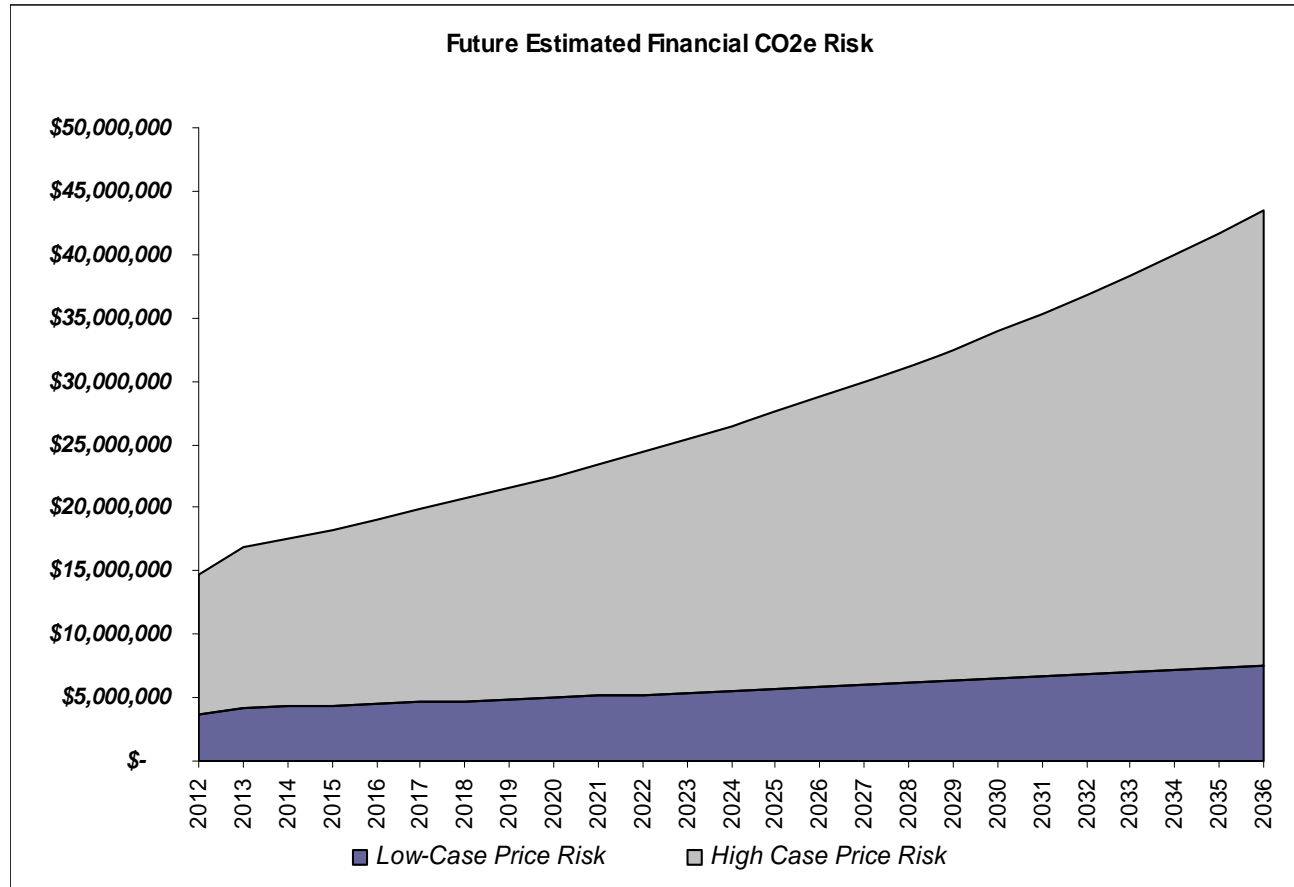


# Economic Uncertainty



Source: Pace and various entities' carbon projections including EPA, MIT, Nicholas Institute, CRAI, ACCF&NAM

# Potential Impact on Industrial Facility

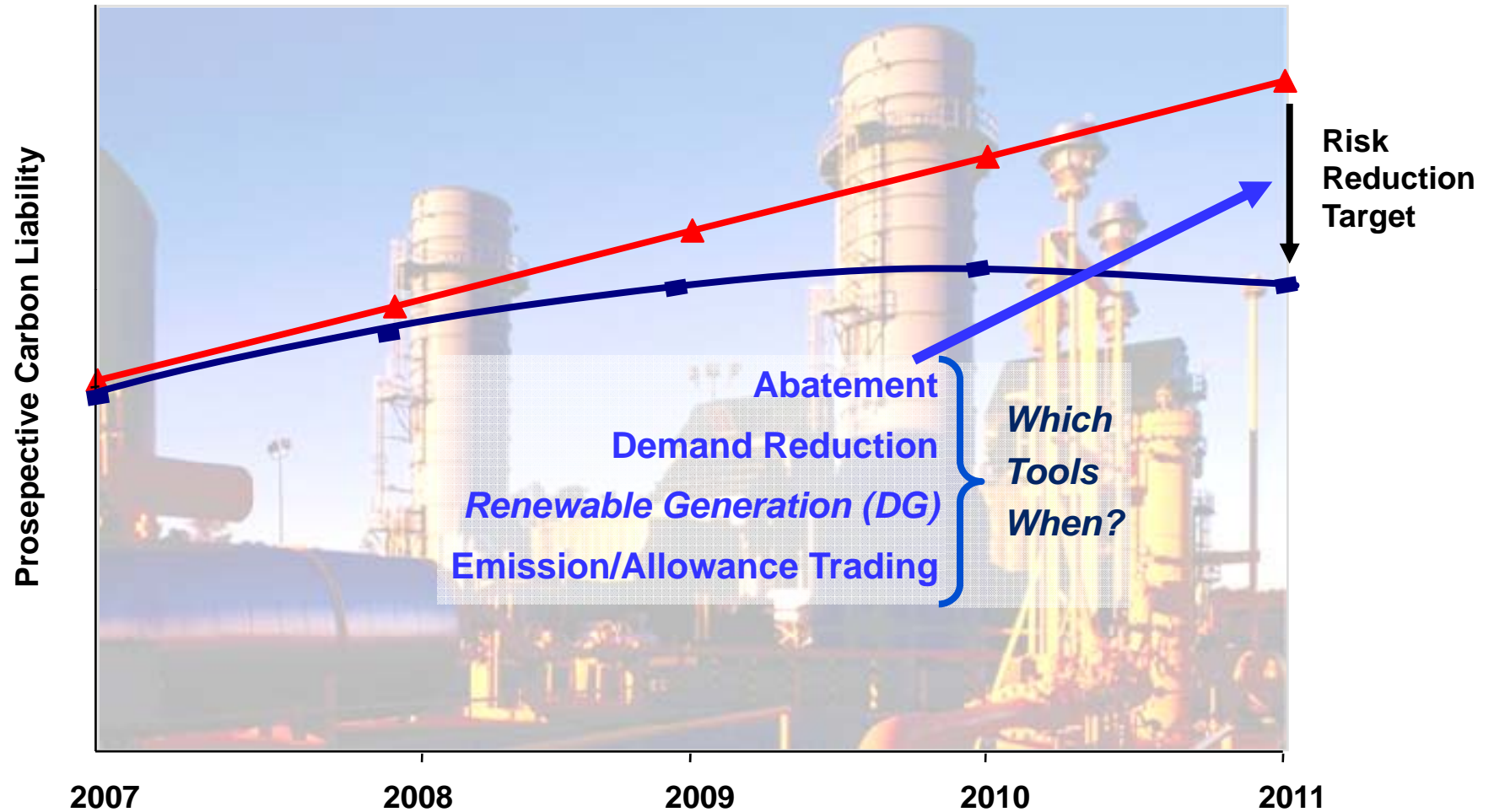


# Forthcoming Climate-Driven Responsibilities

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- A conceptual image showing a hand holding a small globe of the Earth. The background is a green and blue gradient with vertical columns of binary code (0s and 1s) in a lighter green color, suggesting a digital or data-driven environment.
- GHG Inventory
  - GHG Disclosure
    - Liability Reporting (e.g., 10K)
    - Stakeholder Expectations
    - Pre-compliance Reporting
  - GHG Performance Improvement (Carbon Intensity)
  - Carbon Trading

# How Best to Reduce GHG Liability?



## Converging Responsibilities Invite an Integrated Perspective



# A Carbon- driven Strategic Plan





# Representative Energy/GHG Management Outputs

### Energy Dashboard

DASHBOARD
PRICE & STORAGE
WEATHER
INDUSTRY LINKS
ALERTS
My Account | Logout

#### Procurement

*Energy Spend (Rolling 12 months)*

Electricity:	\$107,430
Natural Gas:	\$89,582
Fuel Oil #2:	\$35,229
Propane:	\$2,498
Water:	\$46,923

#### Demand-side Programs

#### Contracts

Forecast Received:	7/23/07
Bid Issued:	7/27/07
Bid Received:	8/10/07
Recommendation Issued:	8/14/07
Award:	8/18/07

#### Risk Management

*Annual Percentage of Saving by Category*

- Fuel Procurement (1)
- Power Procurement (3)
- Tariff Optimization (1)
- Tax Exemption (1)

#### Sourcing

	CounterParty	Term	Price
Gas Supply	Charlevoix	9/1/06 - 3/31/06	\$0.12
Gas Transport	N/A	N/A	N/A
Gas LDC	Semco	1/1/05 - 12/31/10	\$0.66

#### Endex

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### GHG Inventory Reports

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#### Corporate Energy and Environmental Sustainability Reporting, Tracking, Management

##### Diesel Spend for ACME Corp

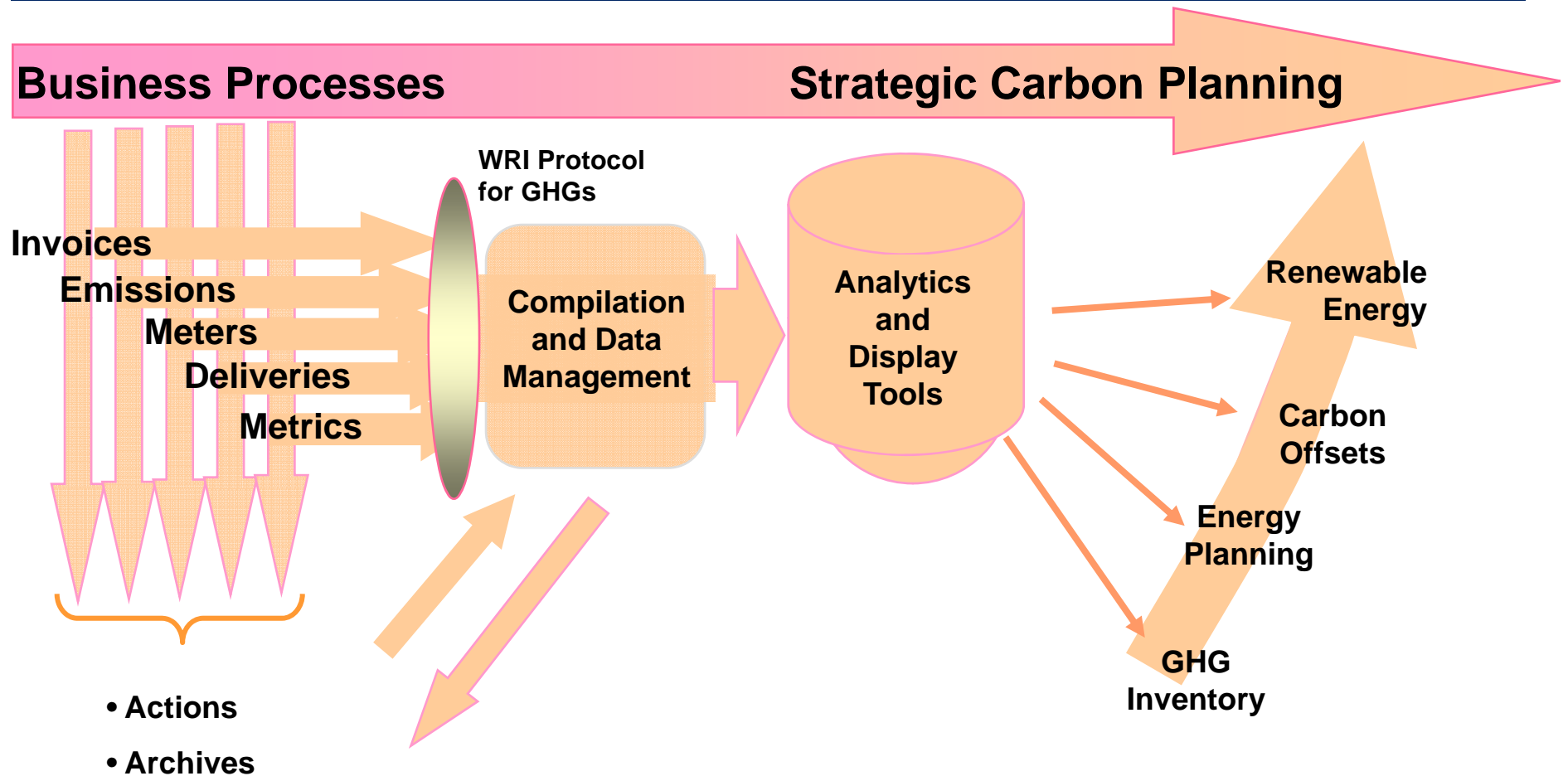
##### Greenhouse Gas Emissions for Chicago Store

##### Purchased Electricity Spend for ACME

##### Greenhouse Gas Emissions for LA Power Plant

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# The Integrated Planning Process Starts with Existing Data Streams



# The Three Major Categories of Offset-generating Activities

GHG Reduction Project



Carbon Sequestration Project



A GHG Avoidance Project



# Examples of Offsets

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- Facility Improvements
  - Direct Emissions Reductions
  - Energy Efficiency
  - Carbon Emissions Capture (CCS)
- Renewable Energy
  - Fuel Switching
  - Distributed Generation
- Carbon Sequestration
  - Carbon Capture and Injection (CCS)
  - On-site Biological Sequestration
  - Off-site Biological Sequestration
- Co-benefits



**Mississippi Bottom Land  
Green Trees Program**



# Navigating RECs and Carbon Markets

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- Voluntary and compliance markets are dynamic and volatile
- Each project has a unique path in the environmental landscape
- RECs and offsets may be differentially attractive, depending on circumstances

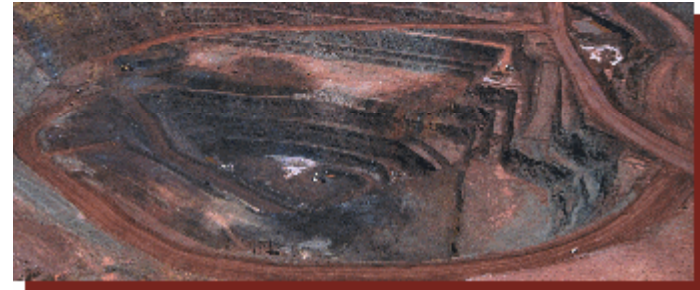




# Case Study: Major Mining/Refining Company

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- Large energy spend and GHG exposure
- Uses purchased fossil energy to run its mills
- Operates coal-fired power plant to meet some of its energy needs
- Uses purchased gas and coal to heat its melters
- Introducing renewable bio-fuel (RF) to generate power or co-fire melting process
- How best to use fuel?



## **DECISION FACTORS:**

- **Point of carbon regulation**
- **Eligibility of Co-firing for RECs**
- **Values of RECs and Offsets**

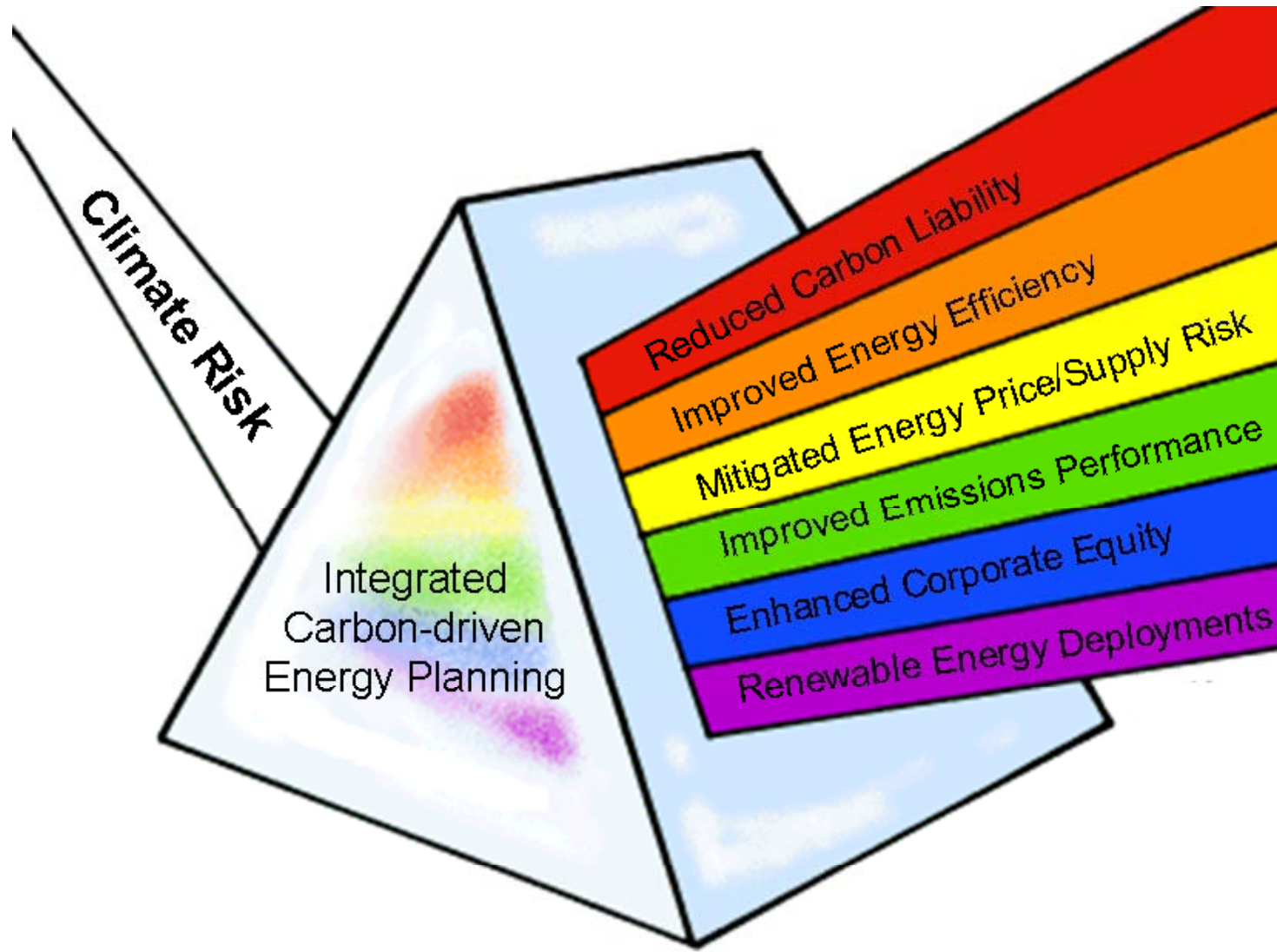
# Navigating RECs and Carbon Markets


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- Voluntary and compliance markets are dynamic and volatile
- Each project has a unique path in the environmental landscape
- RECs and offsets may be differentially attractive, depending on circumstances
- RECs *and/or* offsets may apply; don't presume or double dip
- The first step is Carbon Planning...toward a *Managed Carbon Position*



# Leveraging your Carbon Investment





# The Power of Integration

Breadth of expertise ... depth of experience

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