Leveraging Environmental Market Assets in Financing Renewable Energy Projects

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Outline

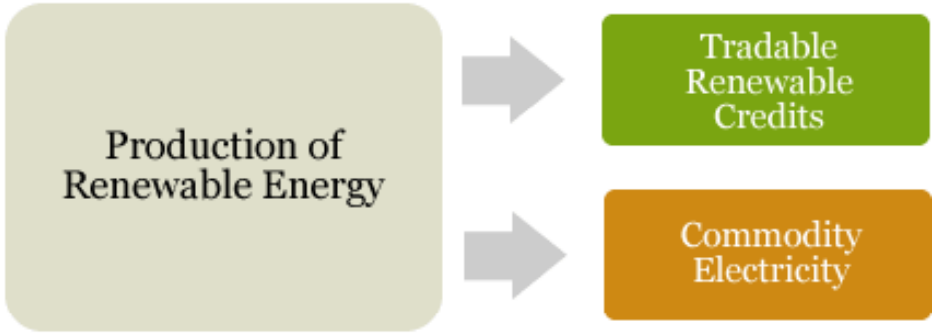
- Purpose of Markets
- Renewable Energy Certificates
- Carbon Offsets
- Risk Mitigation
- Opportunities for Leverage

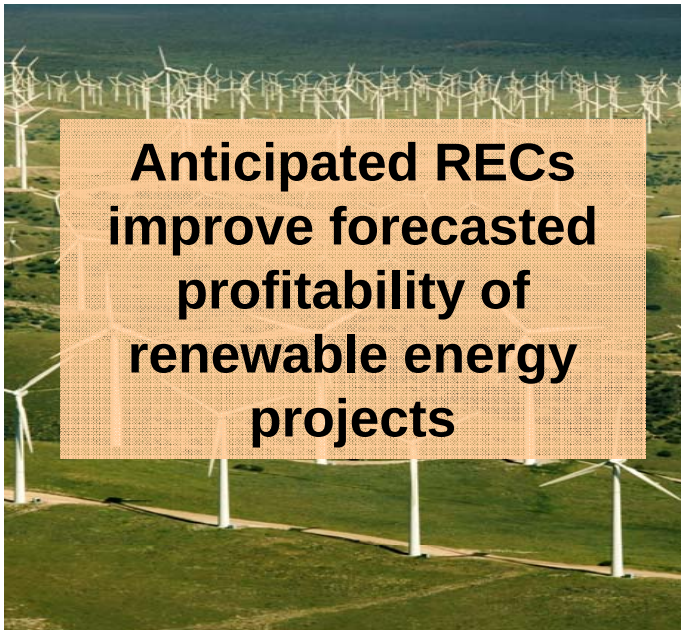
Purpose of Environmental Markets

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

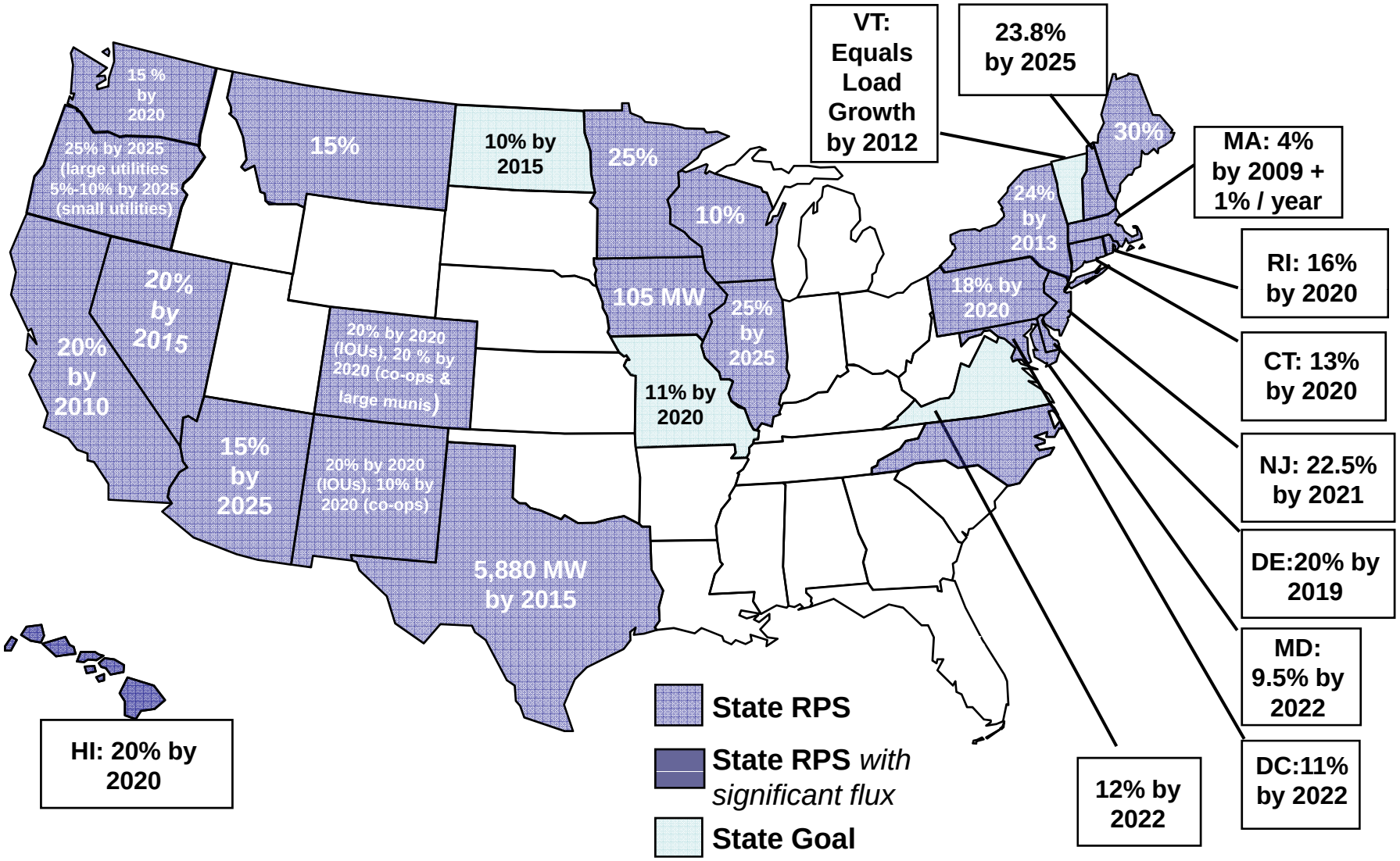
Renewable Energy Certificates (RECs)

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



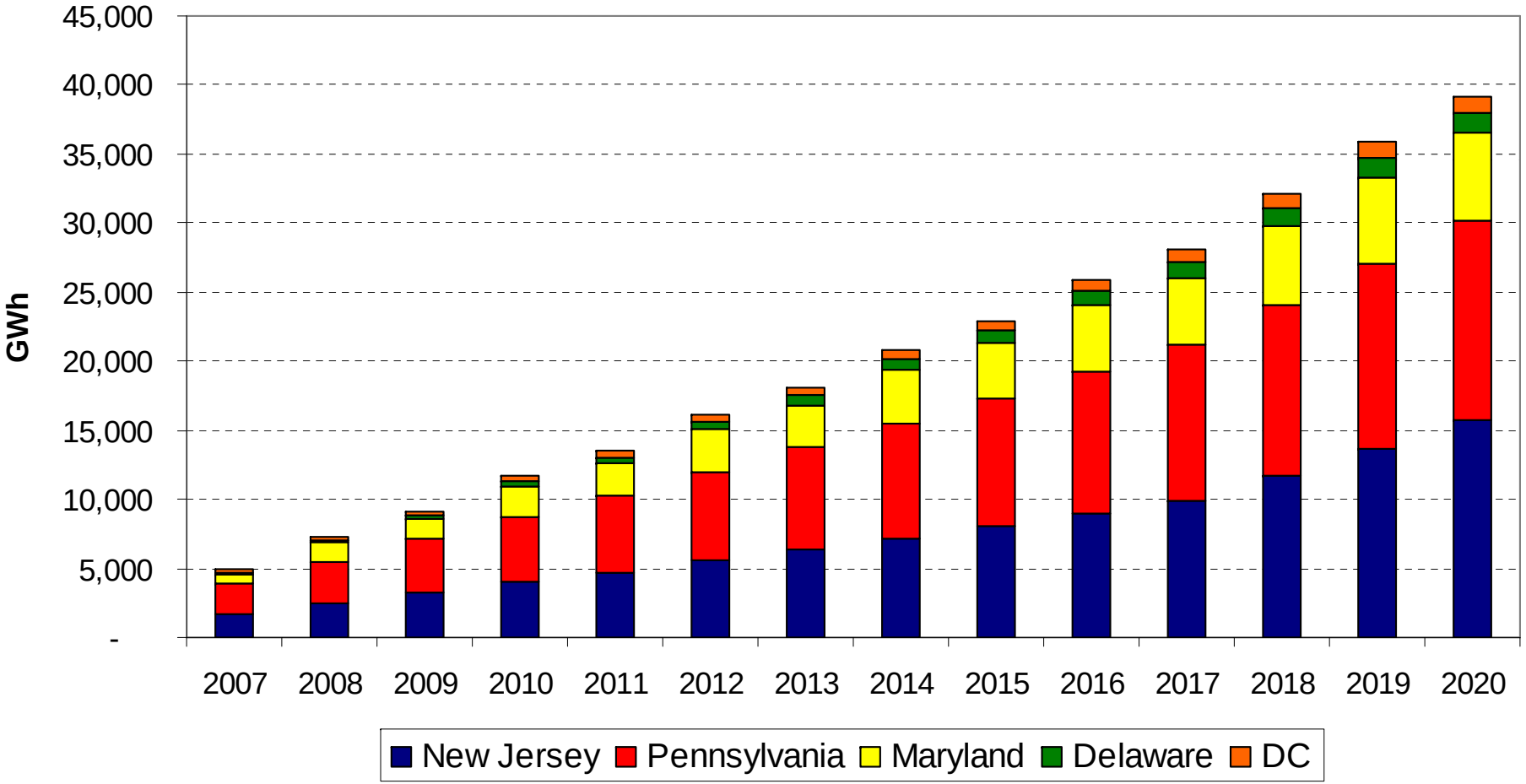


States with Renewable Portfolio Standards (RPS) Create Regulated REC Demand



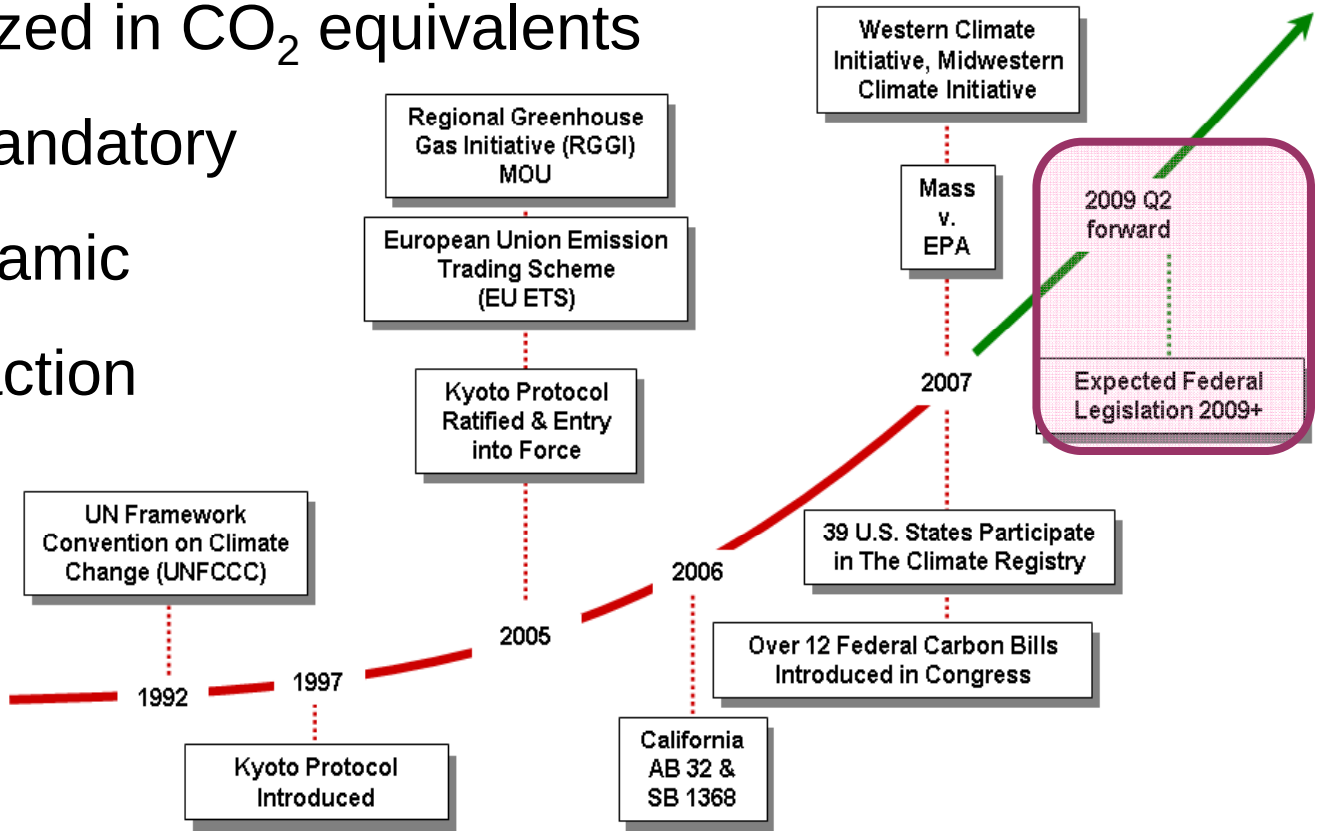
PJM RPS Renewable Generation Demand by State

Pennsylvania: Tier I Only
Maryland: Tier I Only
New Jersey: Class I Only
DC: Tier I Only

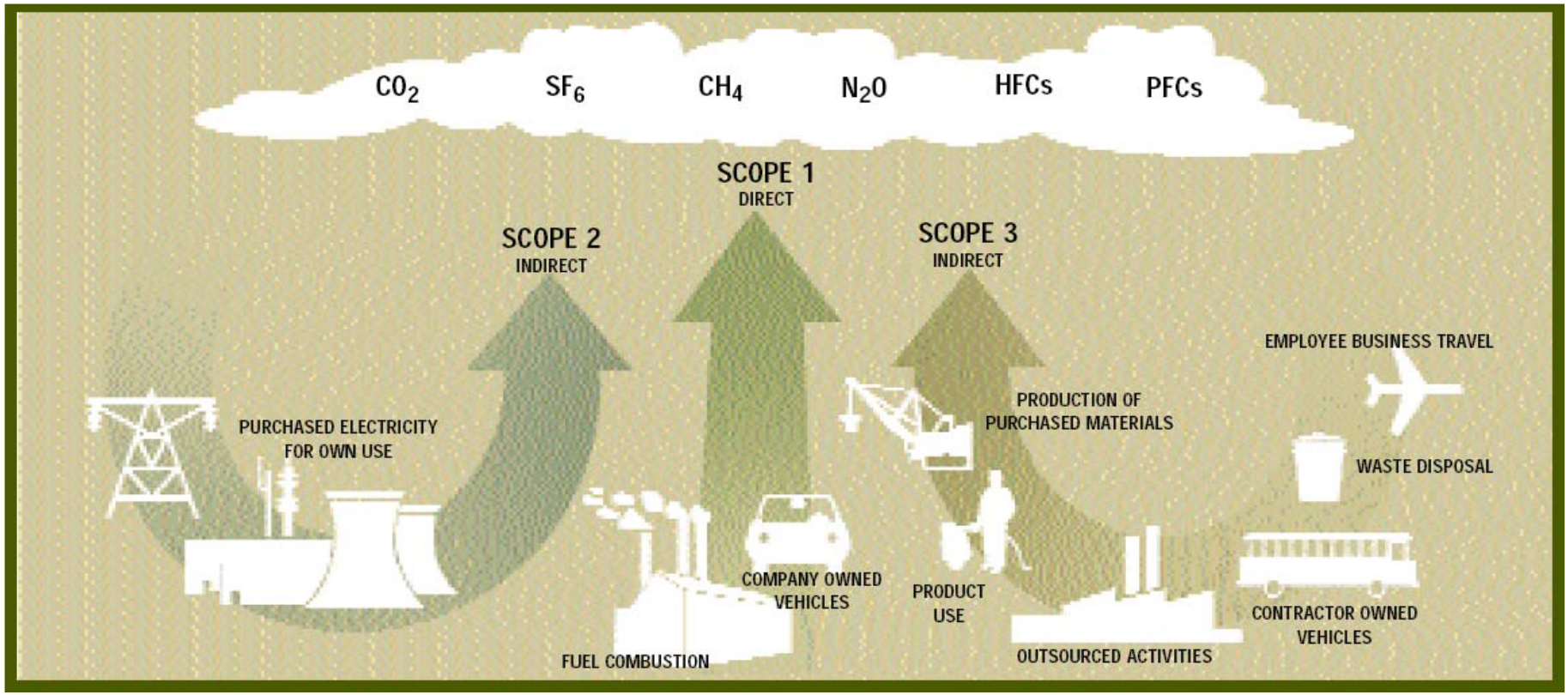


Milestones in Developing the Carbon Markets

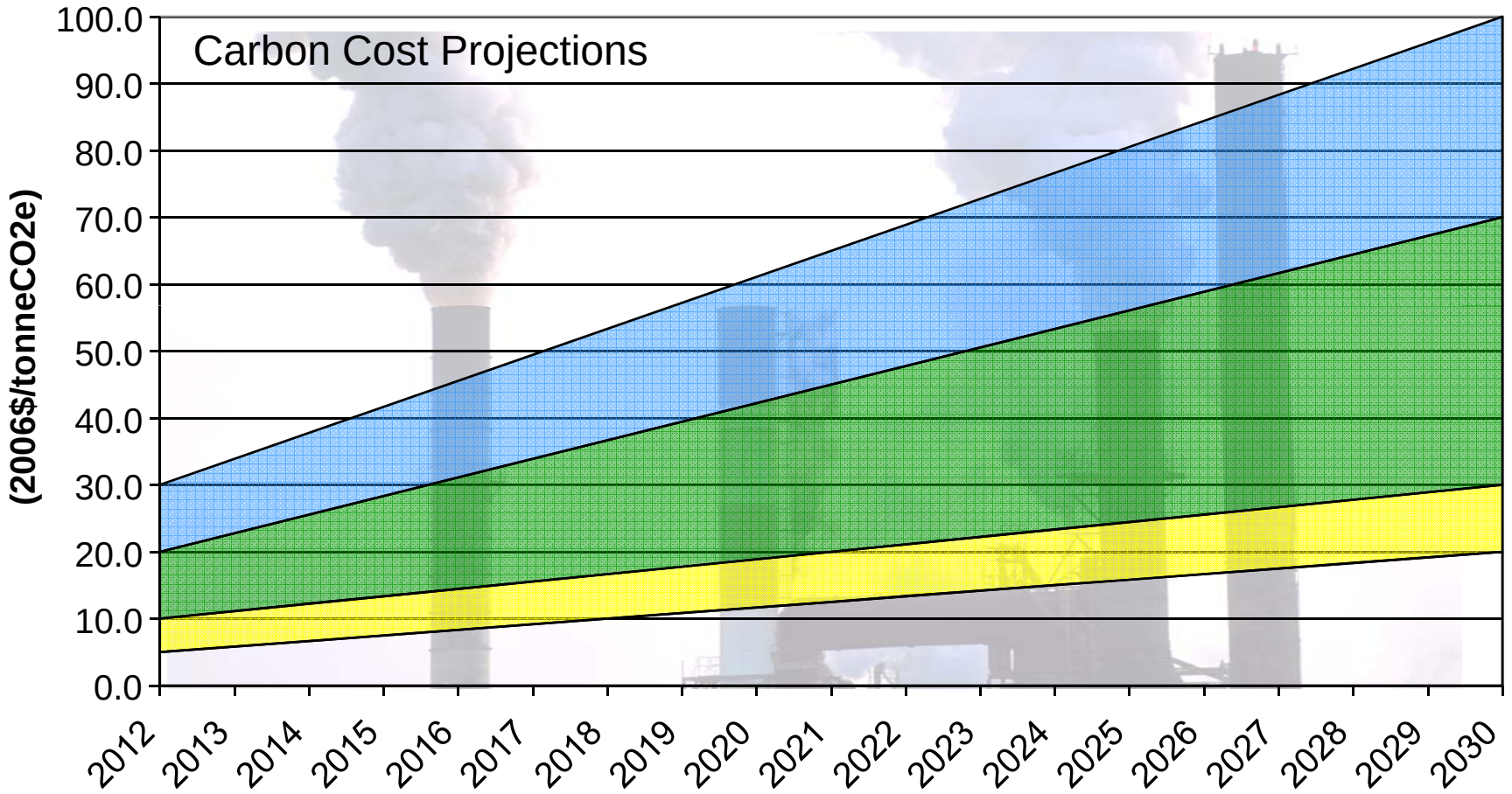
- Accelerating Progress
- Applies to Greenhouse Gases (GHG)
- GHGs Standardized in CO_2 equivalents
- Voluntary and Mandatory
- Diverse and Dynamic
- Rewarding Pro-action



Examples of Regulated Emissions and Categories

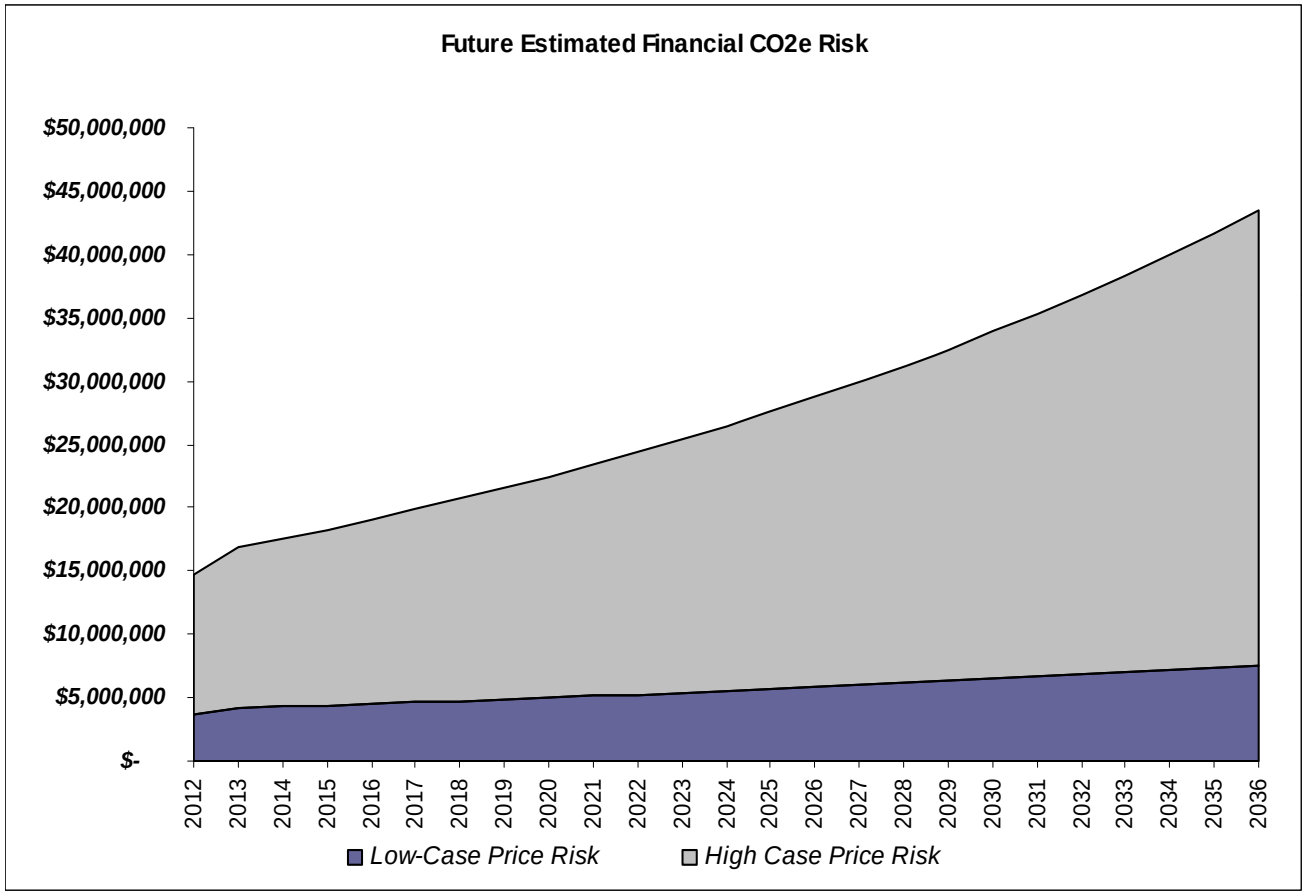


Economic Uncertainty



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

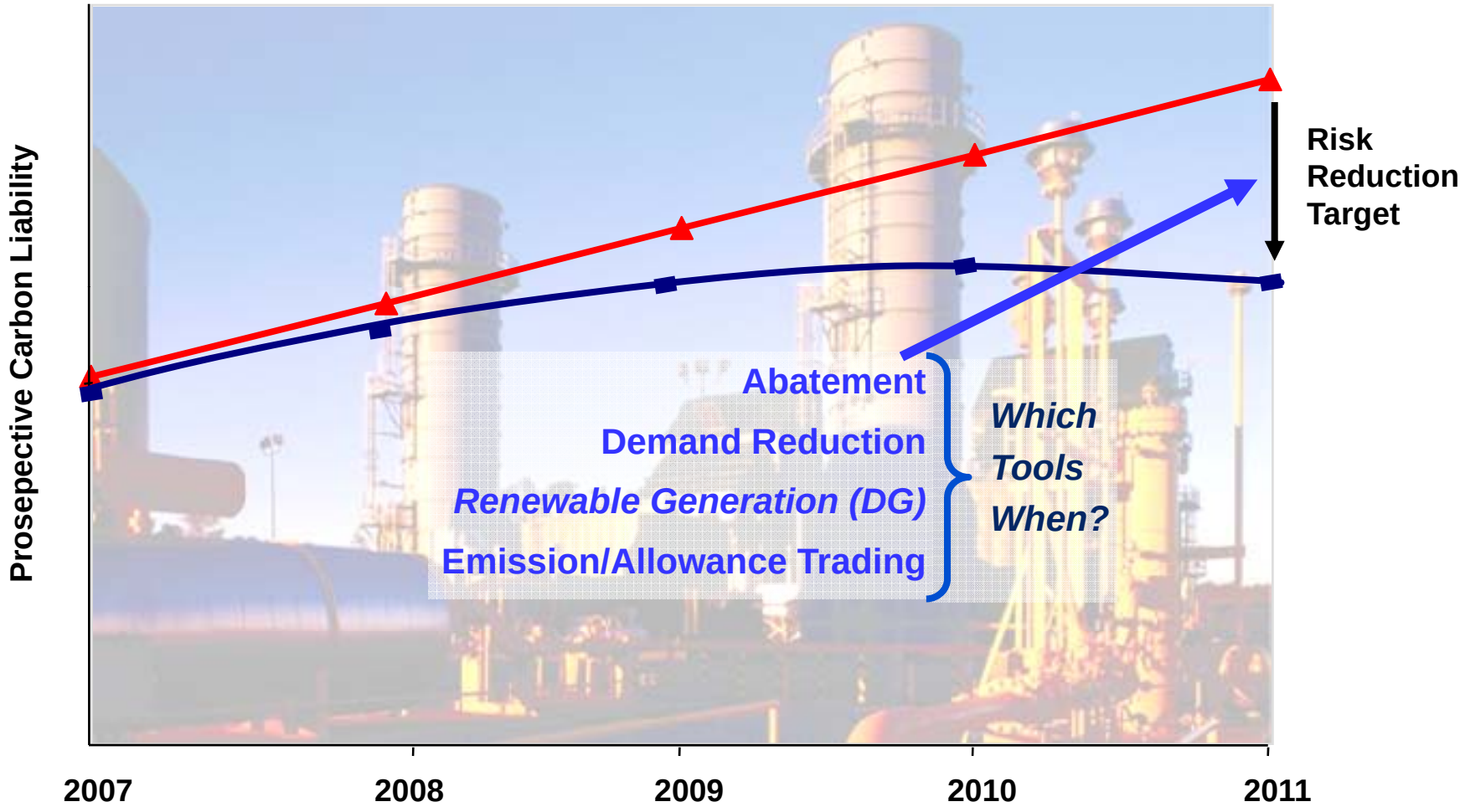
Potential Impact on Industrial Facility



Forthcoming Climate-Driven Responsibilities

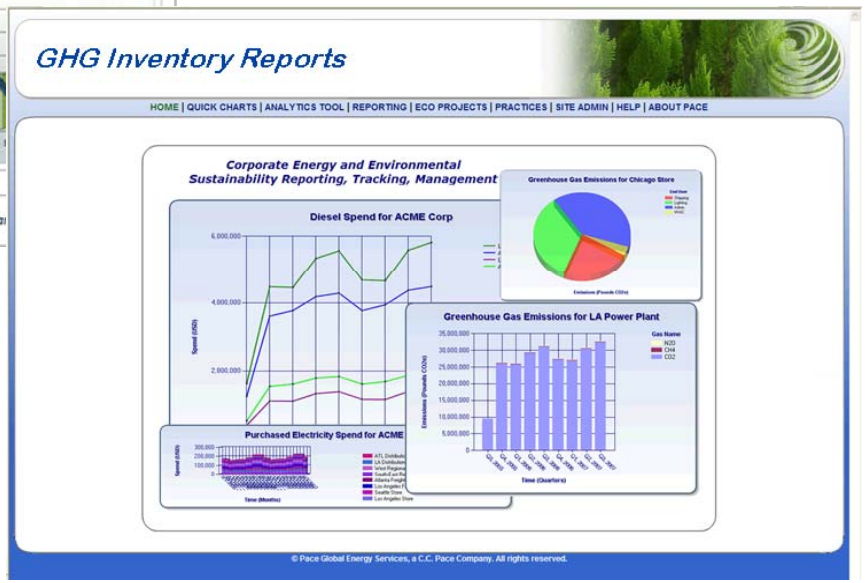
- GHG Inventory
- GHG Disclosure
  - Liability Reporting (e.g., 10K)
  - Stakeholder Expectations
  - Pre-compliance Reporting
- GHG Performance Improvement (Carbon Intensity)
- Carbon Trading

How Best to Reduce GHG Liability?

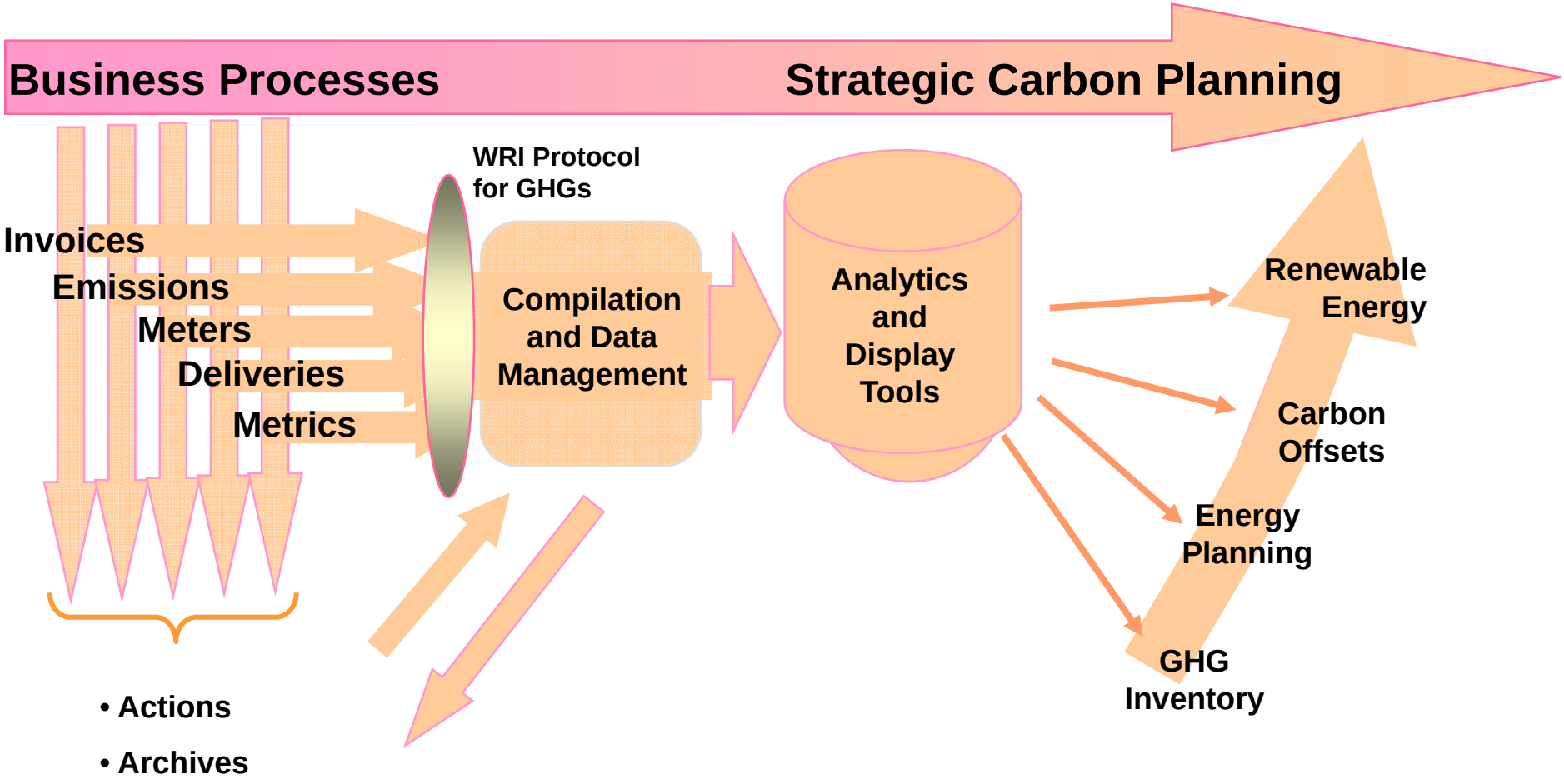


Converging Responsibilities Invite an Integrated Perspective

Representative Energy/GHG Management Outputs



The Integrated Planning Process Starts with Existing Data Streams



The Three Major Categories of Offset-generating Activities

Carbon *Sequestration* Project

GHG *Reduction* Project

A GHG *Avoidance* Project

Examples of Offsets

- 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

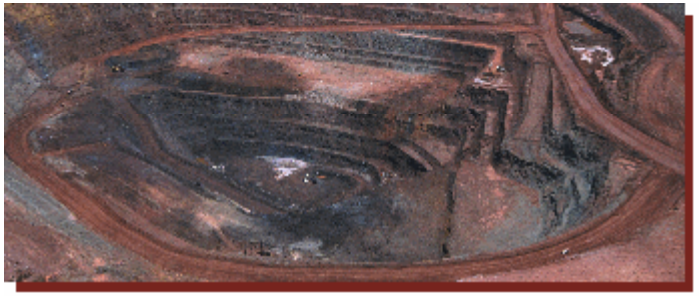
Mississippi Bottom Land Green Trees Program

Navigating RECs and Carbon Markets

- 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

- 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?



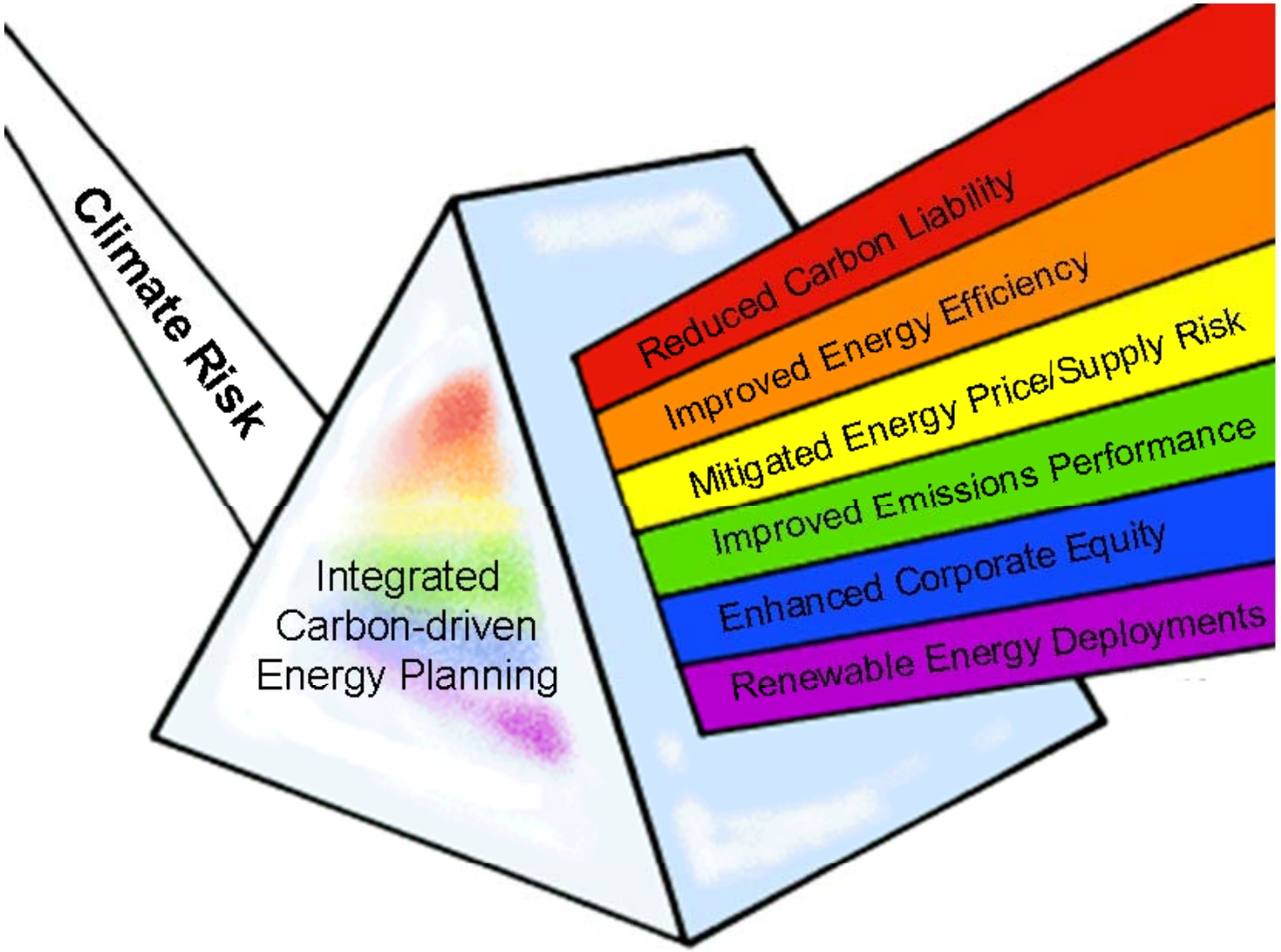
DECISION FACTORS:

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

Navigating RECs and Carbon Markets

- 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



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