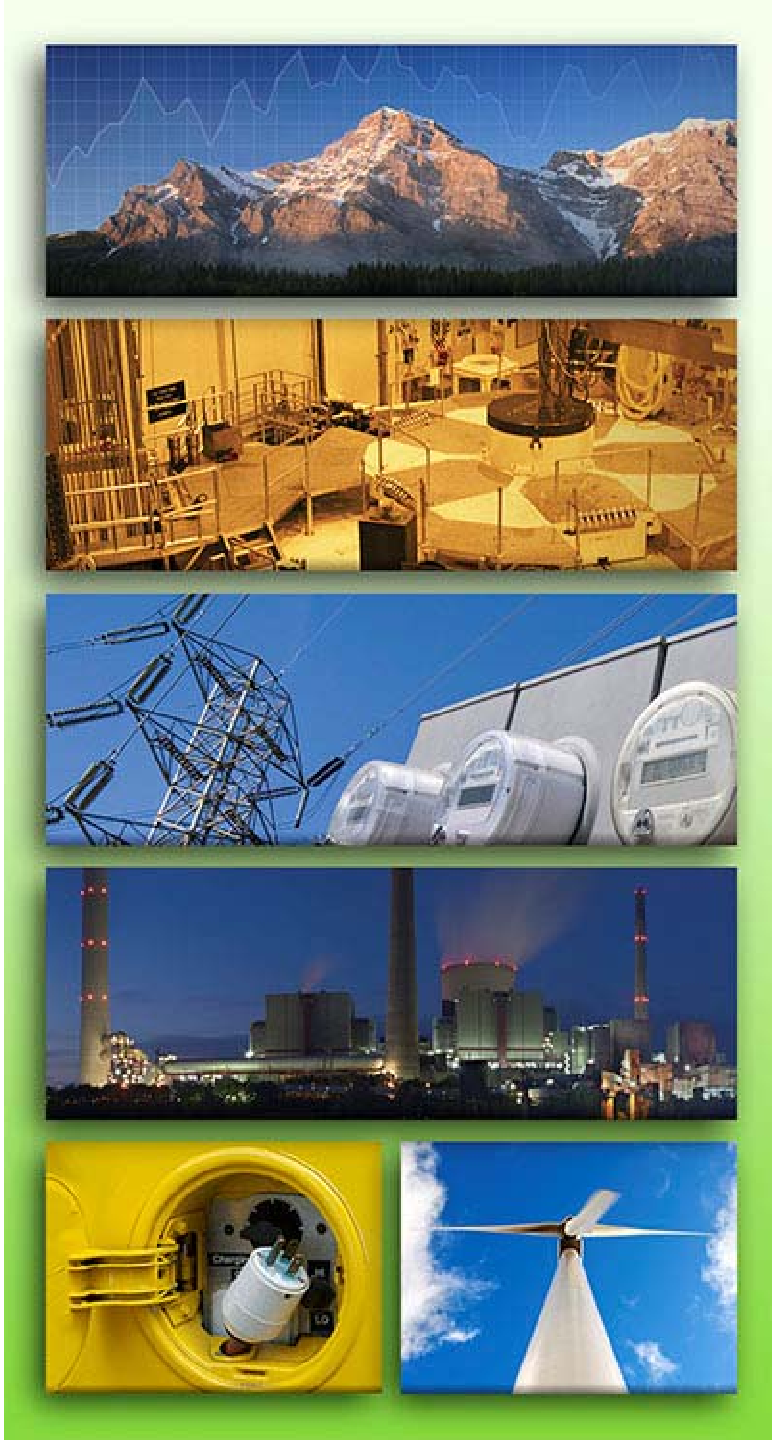

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EPRI Greenhouse Gas Emissions Offset Policy Dialogue Workshop #9

Options for Developing or Procuring GHG Offsets

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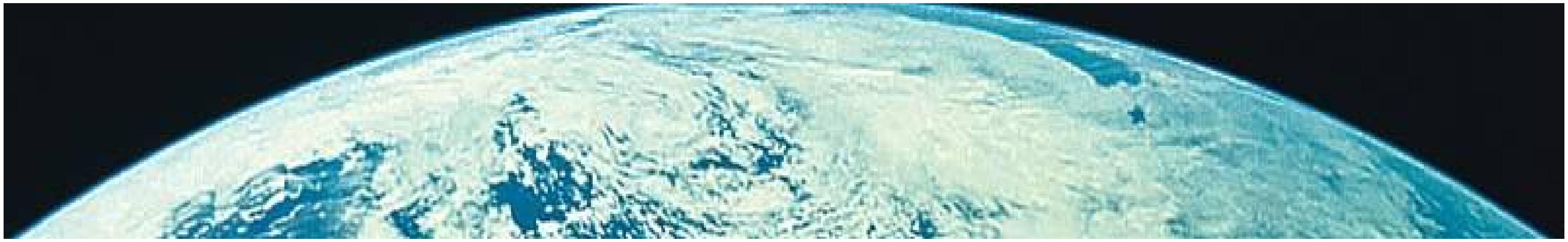
Today's Topics

- Building versus buying offsets
- Offset market players
- Markets for "primary" offset credits
- Markets for "secondary" offset credits
- Managing offset delivery risk



Most Companies Will Choose to "Buy" Offsets Rather than "Build" Them

Build

- Develop "own" offset projects or make direct investment in projects
- May acquire "low-hanging fruit," but…
- Requires dedicated staff, resources and specialized expertise
- Significant project and other related risks
- Non-core business for electric companies

Buy

- Buy "*primary*" or "*secondary*" offsets in the market
- Buying secondary offsets is similar to buying SO_2, NO_x, and fuels
  - Flexible approach
  - Can use financial instruments to diversify and reduce corporate risk
- Offset suppliers include:
  - Offset project developers (e.g., CAMCO)
  - Brokers (e.g., Evolution Markets)
  - Carbon funds (e.g., EEA, Natsource)
  - Banks (e.g., B of A Merrill Lynch, Barclays)
  - Exchanges (e.g., Green Exchange)

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Offset Market Players

- **Offset Standards** – Establish standards for development of offset projects, approve offset methodologies and issue offset credits.
- **Project Developers** – Develop and implement offset projects on the ground.
- **Brokers** – Match offset buyers with project developers and/or other sellers of offset credits.
- **Carbon Funds** – Provide comprehensive "turn-key" development and management of a portfolio of offset projects on behalf of a consortium of funders.
- **Banks** – Provide offset project finance; sell offset credits in the secondary market; increase market liquidity; help customers manage "compliance" portfolio.
- **Exchanges** – Facilitate standardized transactions of offset credits. Exchanges provide market "clearing services," transparency, price discovery, and manage credit risk.

Buying Offsets:
Primary versus Secondary Markets

Primary

- Buying a "strip" of offsets directly from an offset developer
- Analogous to buying a "strip" of power from an IPP via a power purchase agreement (PPA)
- Typically, payment is made on delivery of offsets
- Advantage – lower cost than secondary purchase
- Risk – offsets may not ever be issued or delivered

Secondary

- Buying offset credits after they are issued or with a delivery guarantee
- Analogous to buying wholesale "spot" power
- Offset credits are available from offset brokers, exchanges and banks
- Advantage – No project risk. Offsets have been issued and can be delivered immediately.
- Risk – higher cost than primary

The Market for Primary Offset Credits

- *Primary* offset credits (e.g., CERs) often are purchased in a "forward stream" – a multi-year "strip" of different "vintages."
  - In the CDM market, primary CERs typically are transacted in volumes of 10,000 – 1,000,000 metric tons CO_2e per year
  - Typical time period for a "strip" is a 3-5 years, corresponding to EU ETS Phase 1 and 1st Kyoto compliance periods.
- Project developers sell primary offsets for several reasons:
  - To finance their projects in advance (e.g., partial up-front payment)
  - To get financing for the projects (e.g., pay-on-delivery contracts)
  - To lock in offset sales prices.
- Most sellers of primary offsets do not provide a delivery guarantee (i.e., a guarantee the seller will deliver valid compliance instruments, whether or not the offset project eventually passes through all regulatory hurdles).

Note: Much of the information presented on this and subsequent slides is based on experience with the "Kyoto mechanisms" and the EU ETS.

Contracts and Financing in Primary Offset Markets

- Forward transactions – Forwards are designed for future delivery of offsets as emission reductions are generated.
  - Payment on delivery with fixed pricing
  - Payment on delivery with variable pricing
  - Partial pre-payment with fixed or variable pricing
- Hybrid pricing structures involving fixed and variable components.
  - One common structure is to combine a minimum (fixed) price, plus a percentage of a future emissions allowance (EUA) price.
  - This approach is designed to help sellers to capture market appreciation.
- Debt and equity agreements

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Buying Primary: Do It Yourself

Origination	• Company must identify potential projects or use brokers • Company must seek out projects from project developers
Due Diligence	• Company must undertake all aspects of due diligence • Experience suggests it may require review of 50-100 projects to find 1
Contract Negotiation	• Company negotiates contract or arranges for outside legal counsel to do so.
Portfolio Management	• Company must manage its own offset project portfolio and hedge financial risks
Offset Delivery	• Company must work directly with project developer to manage offset credit delivery
Compensation	• No compensation • Company must pay the cost of dedicated staff time
Other Factors	• Company must manage necessary service providers such as legal, MRV, receivables, payables, accounting

Buying Primary: Carbon Funds v. Brokers

	Offset Brokers	Carbon Fund Managers
Origination	• Locate projects to meet company criteria • Presents project opportunities to company	• Develops and manages portfolio of projects • Originates & works with intermediaries to locate projects to meet company goals • Often has authority to transact based on pre-approved criteria
Due Diligence	• Company must do due diligence • Experience suggests it may require review of 50-100 projects to find 1	• Manager undertakes due diligence
Contract Negotiation	• Broker may assist in negotiation of contract terms, but company negotiates legal contracts	• Manager develops and negotiates offset contracts
Portfolio Management	• Company manages contracts and project portfolio	• Fund manages contracts and project portfolio for target volume and cost objectives
Offset Delivery	• Company must manage relationship with project developer to arrange for credit delivery	• Fund manages distribution of offset credits to company accounts
Compensation	• In general, compensation based on value of transaction	• Compensation typically based on management fee and incentives
Other Factors	• Company must manage key service providers	• Fund manages service providers (e.g., legal, MVR, accounting, etc…)

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Delivery Risks for Primary Offsets

- The risk that the project will not obtain regulatory approval due to technology-specific considerations;
- The risk that the technology employed by the project will not operate as planned, and will deliver fewer emission reductions than anticipated;
- The risk that the "host" country's regulatory authority will not be able to provide its approval for the project, or will change its rules over the life of the project;
- Investment risks associated with doing business in the host country; and,
- Risks associated with the seller's credit rating or relative experience developing offset projects.

Managing Offset Credit Delivery Risk

- Undertaking site visits and ongoing monitoring over the course of the project
- Develop a robust diversified offset project portfolio to deal with non-systemic risks
  - Different technologies
  - Different geographic locations & countries
  - Different counterparties
- Large buyers with resources can diversify in two ways:
  1. Diversify portfolio of primary offsets (described above)
  2. Diversify approaches used to procure offsets:
     - Develop “internal” offset projects
     - Procure primary offsets directly from project developers, and/or through brokers;
     - Participate in one or more carbon funds.

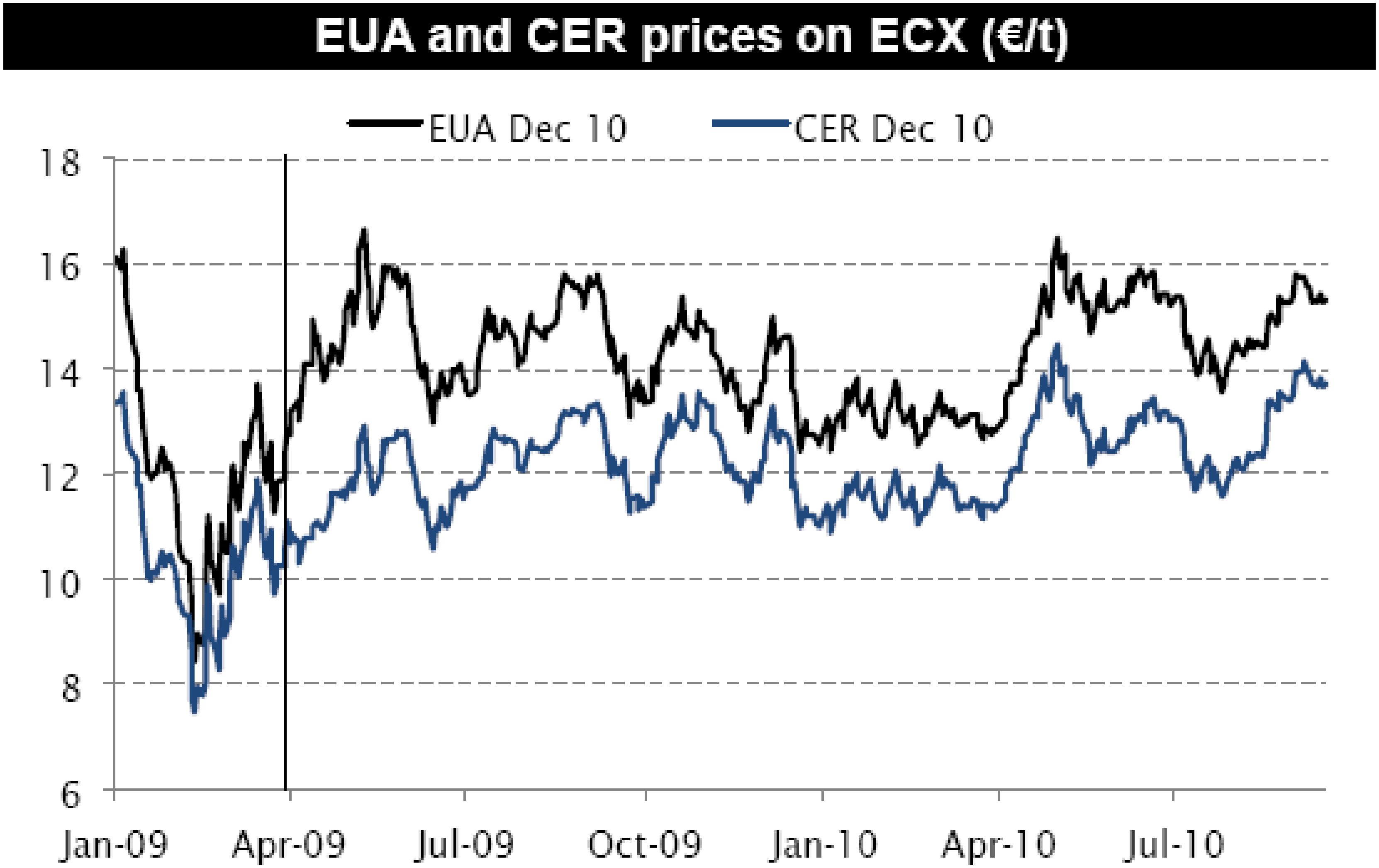
The Market for Secondary Offsets (1 of 2)

- The *secondary* market refers to the market for guaranteed or secondary offsets (e.g., sCERs). The sellers provides a delivery guarantee, thereby taking on delivery risk in exchange for charging a premium for the guarantee.
- For compliance buyers, secondary offset credits provide the advantage of minimal risk of non-delivery, but are more costly than primary offsets
- Secondary offsets typically are sold "over-the-counter" (OTC) by banks and brokers, and on exchanges.
- Other market participants (e.g., traders & project developers), use secondary markets and derivatives such as "call" and "put" options to hedge exposure to price or volume (i.e., delivery) risks in primary CER markets, or to arbitrage between secondary CERs and EU Allowances (EUAs)

The Market for Secondary Offsets (2 of 2)

- The secondary market also includes a spot market for issued offsets which are sold on exchanges – similar to the spot market for wholesale electricity.
- Spot market transactions are designed for near immediate payment and settlement (i.e. delivery) of a volume of offset credits.
- Secondary offsets can be sold in spot and forward transactions
- Parties also have been using derivates, such as “call” and “put” options to hedge price risk.

Volatility of Allowances and Offset Prices Requires Management of Price Risk



Source: European Carbon Exchange (ECX)

Necessary Internal Corporate Structures, Required Resources and Expertise

- Ability to manage offset pricing risks
- Ability to manage risk associated with offset delivery (if active in primary market)
- Legal expertise, particularly in commercial contracting
- Tax and accounting services
- Commodity trading expertise
- Financial modeling expertise
- Regulatory affairs

Additional Functions Needed for Firms Developing Offsets "in House"

- Dedicated staff to locate offset project opportunities and to conduct due diligence
- Dedicated staff to prepare project design documents
- Dedicated staff to guide offset projects through regulatory approval and issuance process
- Process for buying "internal" offsets from and transferring them between business units;
- Process for determining if and how to sell internal offsets in external markets
- Process for banking internal offsets where this is deemed advantageous
- Providing regulatory advice and other services to business units to assist them with successfully moving offset projects through the regulatory approval process.

Thank You for Participating

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