



What on Earth are Carbon Credits?

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What on Earth are Carbon Credits?

Rory Gopaul,
 director of business development
 Carbon Solutions Group, LLC



Carbon Solutions Group: Who We Are

- Carbon Solutions Group, LLC. (“CSG”) is an environmental asset management and carbon project development firm.
- CSG assists building owners, engineering firms and architecture firms by providing:
 - Energy Efficient Technologies
 - Carbon Market Expertise
 - GHG Reduction Solutions



Carbon Credit Origins: What on Earth is a Carbon Credit?

- The term Carbon “Credit” or “Offset” refers to any Greenhouse Gas (“GHG”) Emission Reduction of a ton/tonne, reduced by a business or entity that contains the ultimate goal of climate change mitigation.
- This presentation will explain:
 - Carbon Offset Types
 - Carbon Markets and Methodologies
 - Greenhouse Gas Explanation
 - Carbon Footprint and Buildingprint Explanations



Carbon Credit Delineations

- **Certified Emission Reduction (“CER”)**
 - Created by CDM projects, a CER is the basic Carbon Offset of the European Union Emission Trading Scheme (“EUETS”). It is the most monetizable and rigorously audited emission reduction unit in the world.
- **Emission Reduction Unit (“ERU”)**
 - Created by JI Projects in Annex 1 countries.
- **European Union Allowance (“EUA”)**
 - Carbon tonne allowances distributed by the EU.
- **Voluntary/Verified Emission Reduction (“VER”)**
 - A VER is a verified, voluntary emission reduction tonne.
- **All but EUA are required to adhere to the concept of “Additionality”.**



Additionality

- **Additionality** is the concept that a business decision is made with consideration for Greenhouse Gas mitigation that would not have been made otherwise. Additionality involves 5 Steps:
 1. Intent: Does this project specifically reduce carbon?
 2. Identification of Alternatives: Are other projects available?
 3. Incentive Analysis: Is the project economically attractive?
 4. Analyze the Barriers: Are there cost or socioeconomic barriers?
 5. Common Practice Analysis: Are measures commonly implemented?
- These steps will ensure that necessary rigor has been applied in order to determine whether the carbon credit in question has been produced by a project that is truly reducing carbon dioxide and equivalent GHGs.



Carbon Credit Origins: What is a Greenhouse Gas?

- Greenhouse Gases (“GHGs”) are components of the atmosphere that contribute to the greenhouse effect. They Include:
 - Carbon Dioxide (CO₂): Global Warming Potential (“GWP” is the measure of how much a given mass of greenhouse gas is estimated to contribute to global warming) of 1
 - Methane: GWP of 21
 - Nitrous Oxide (N₂O): GWP of 310
 - Sulfur Hexafluoride (SF₆): GWP of 23,900
 - Hydrofluorocarbons (HFCs): GWP of 12 - 12,000
 - Perfluorocarbons (PFCs): GWP of 6,500 - 9,200



Carbon Market Background: Introduction to Carbon Trading

- There are currently several carbon trading systems in place worldwide, with the largest being in the European Union.
- These trading systems are a “Flexible Mechanism” of a “**Cap-and-Trade**” program which is an administrative approach used to control pollution by providing economic incentives for achieving reductions in the emissions of pollutants.
- The major Cap-and-Trade GHG Exchange is the EUETS, resulting from the Kyoto Protocol.



International Carbon Markets: The Kyoto Protocol and EUETS

Kyoto Protocol:

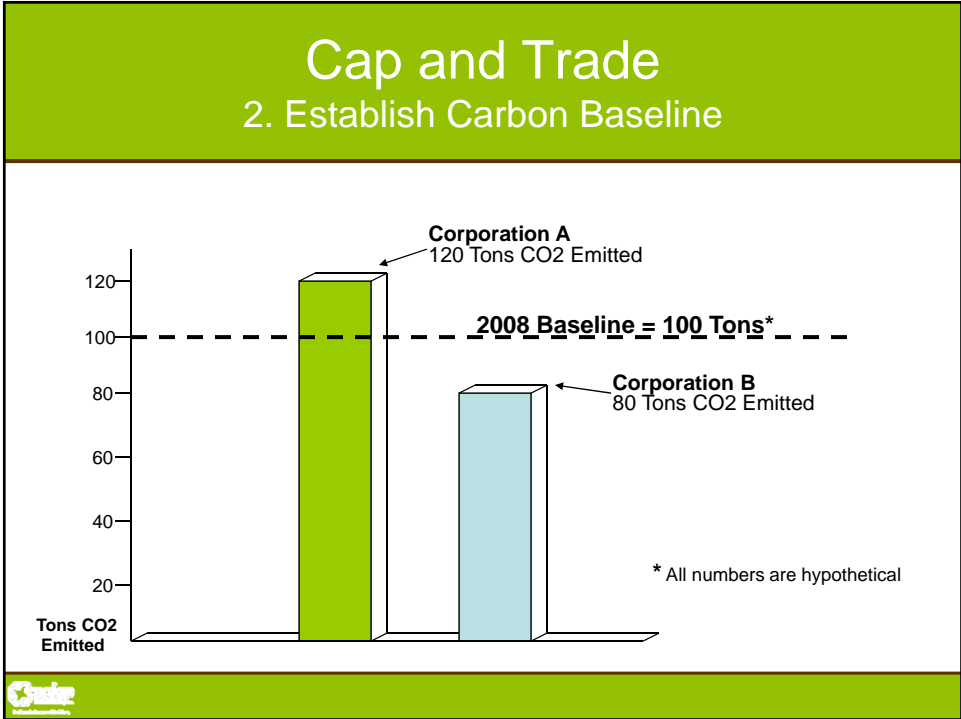
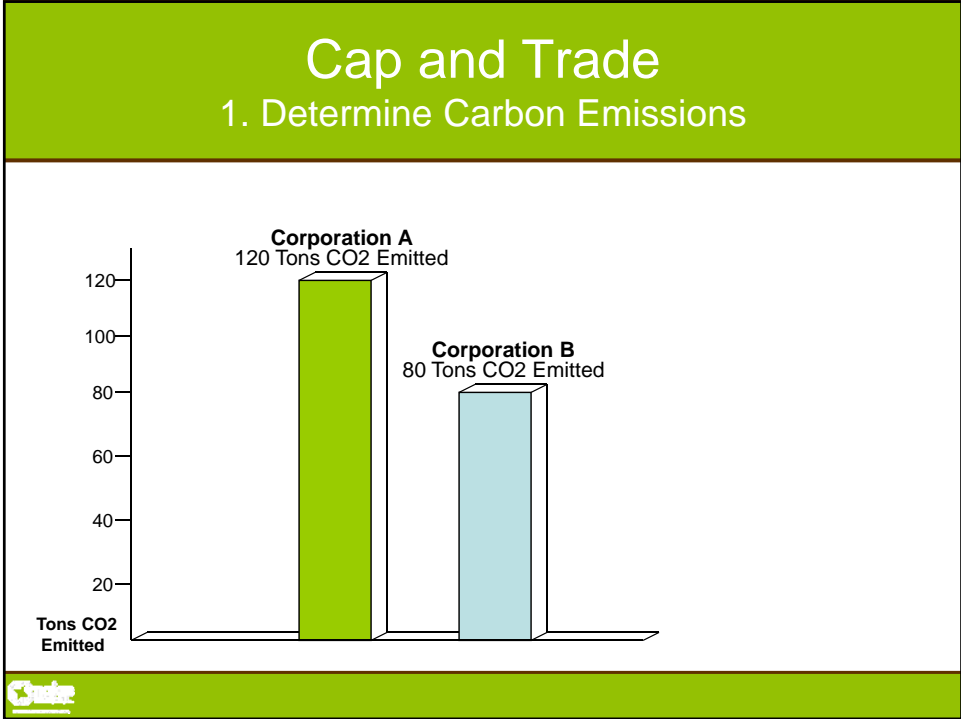
- The Kyoto Protocol is an agreement under the UN Framework Convention on Climate Change (1992) which laid the groundwork for carbon trading and created the EUETS.
- Under the Kyoto Protocol, industrialized countries committed to reducing emissions by 5.2% by 2012
- Emissions compliance gap is estimated to be at 1 billion carbon credits per year in 2008-2012
- Parties can meet their targets through Kyoto's Cap-and-Trade (emissions trading) market-based **Flexible Mechanisms**

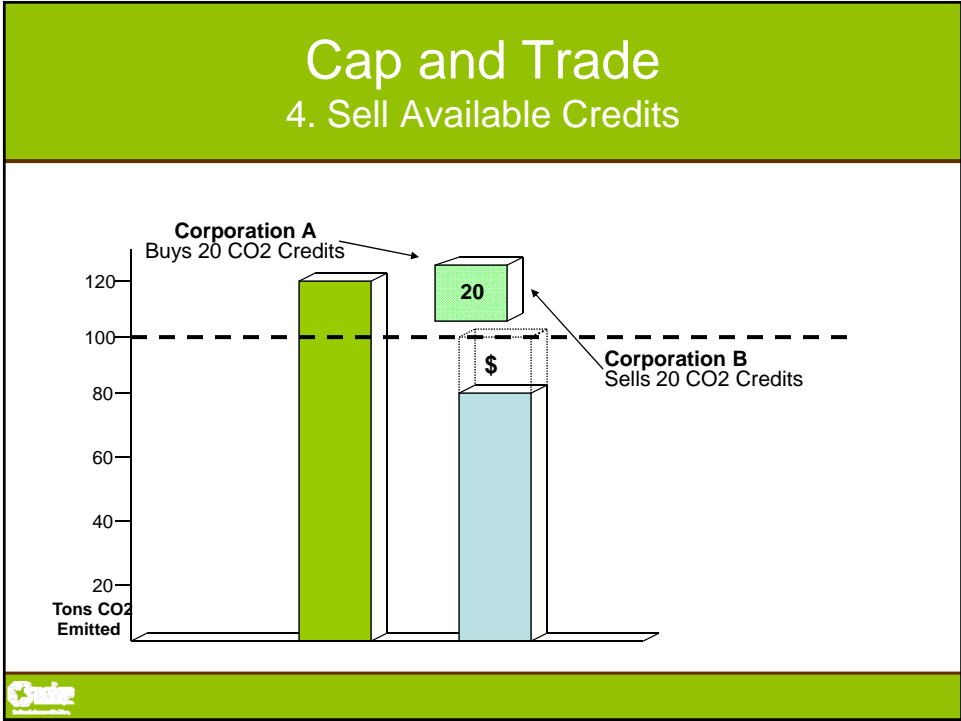
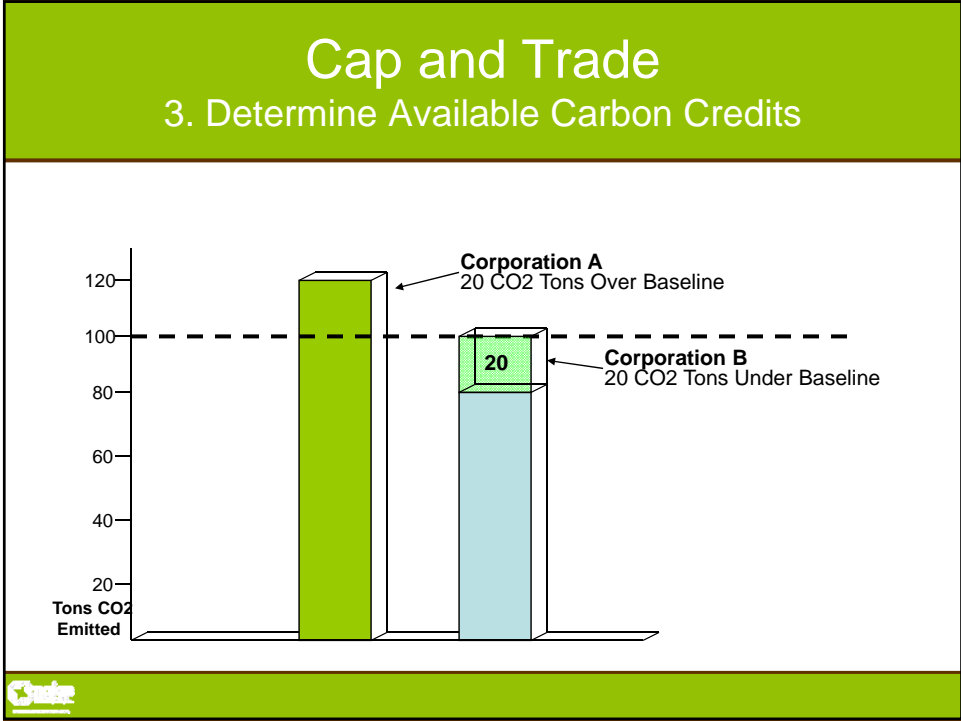


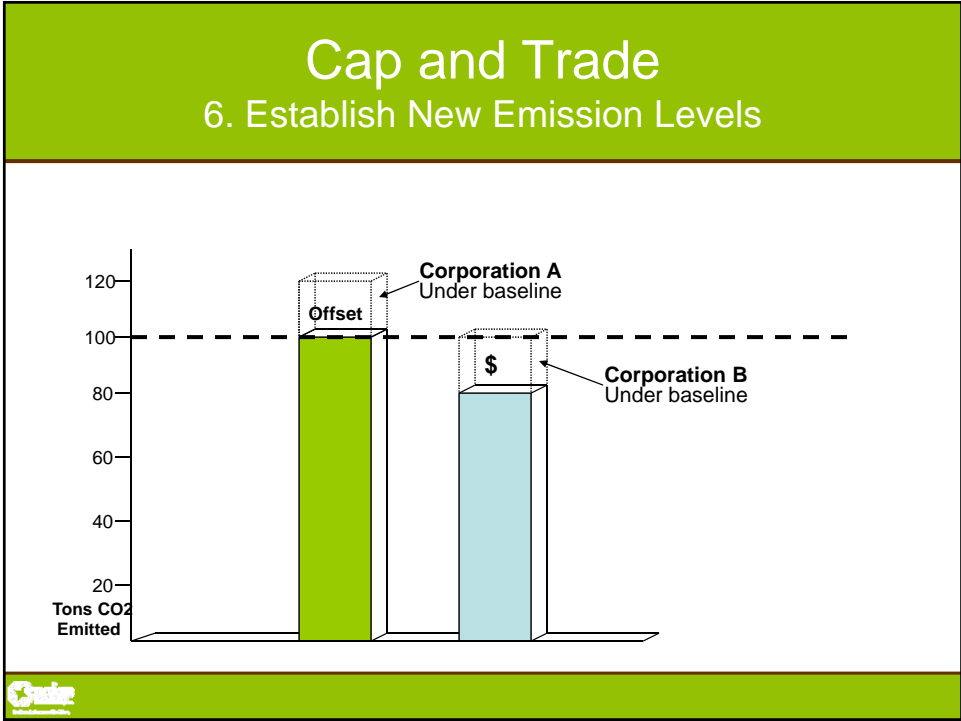
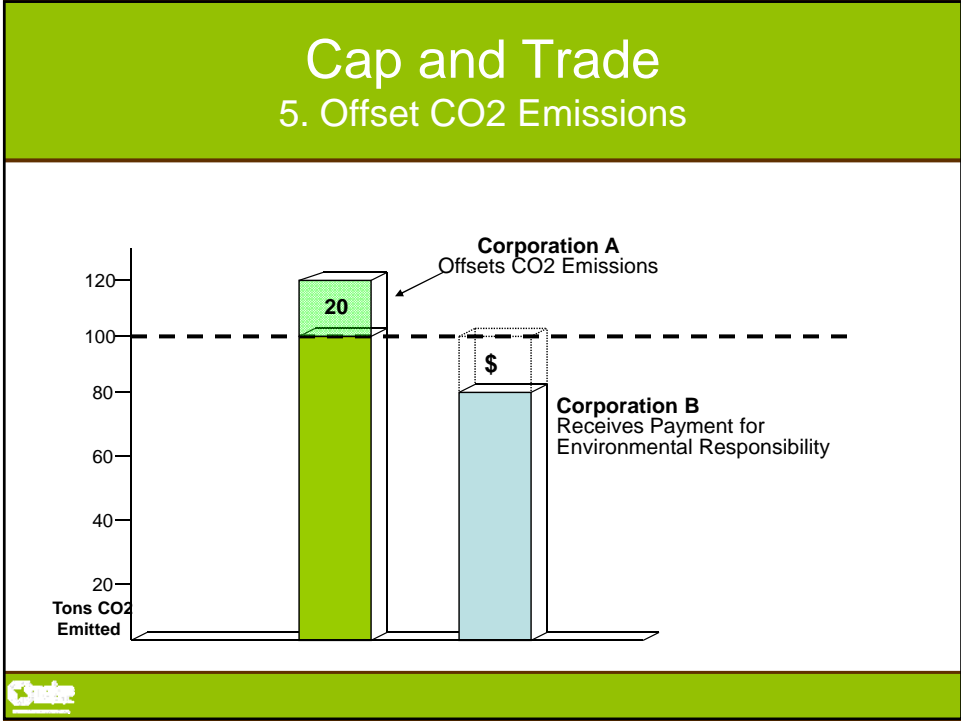
International Carbon Markets: Flexible Mechanisms of the Kyoto Protocol

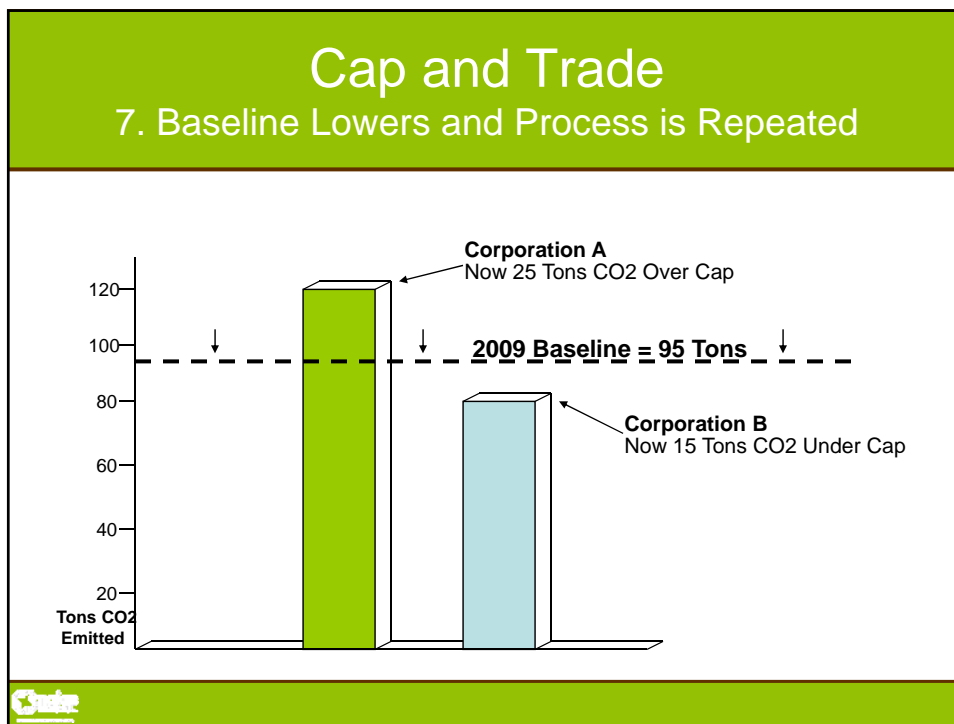
- **Clean Development Mechanism (CDM)** – creation of Certified Emission Reductions (CERs) from projects in developing countries
- **Joint Implementation (JI)** – creation of Emission Reduction Units (ERUs) from projects in developed countries which includes Eastern Europe
- **Emissions Trading** through “Cap-and-Trade”
- Demand for carbon credits becomes significant due to the fact that the carbon market is net short by design











GHG Emission Responsibility: Who is Responsible?

- The direct polluter is generally the regulated sector and therefore responsible for abatement of emissions under a cap. However, in practice the indirect polluter ends up paying much of the economic disincentive.
- **So, what is the difference between a direct and indirect emission?**
- Direct GHG emissions are emissions from sources that are owned or controlled by the reporting entity (ex. A Power Plant).
- Indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity (ex. An Office Building).

GHG Emission Responsibility: Scope of GHG Emissions

Emissions are further categorized in scopes when determining GHG inventory:

- Scope 1: All direct GHG emissions.
- Scope 2: Indirect GHG emissions from consumption of purchased electricity, heat or steam.
- Scope 3: Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc.



Offset Project Types

- | | |
|---------------------------------|------------------------------|
| •Wind Projects | •Green Building Projects |
| •Solar Photovoltaic | •Landfill Gas |
| •Energy Efficiency | •Wastewater Methane Projects |
| •Agricultural Methane Avoidance | •Mass Transit CDM / JI |
| •Fuel Switch Projects | •Afforestation Projects |



Green Building Projects

The Missing Piece of the GHG Puzzle



Green building projects represent increased energy efficiency and lower carbon dioxide emissions in one of the most important sectors of any economy.

Commercial buildings in particular represent the largest share of emissions that individuals will come in contact with on a daily basis.



Green Building Projects

Carbon Emission Credit Opportunities

A building Energy Conservation Measure (ECM) does have the potential to generate emission reduction credit as part of a Green Building initiative. However, there are some significant challenges to an ECM because of the inherent differences between these building measures and traditional projects.

These challenges generally include:

- **Additionality (Financial)**
- **Measurement & Verification**
- **Ownership of Reductions**
- **Project Magnitude**
- **Methodology Development**



Green Building Projects Carbon Emission Credit Opportunities

Programme of Activities:

- Bonn, 27 June 2007 – The Kyoto Protocol's clean development mechanism (CDM) is set to scale up, in reach, scope and effectiveness, as a result of new procedures and guidance for programmatic CDM adopted by the mechanism's Executive Board.
- “Until now, we’ve registered single projects, in single locations. With the new procedures and guidance, developed in response to requests from Kyoto Protocol countries, the way is now clear for project developers to submit for registration many projects, covering a wide area, under a single ‘programme’ umbrella,” said Hans Jürgen Stehr, chair of the Executive Board of the CDM.
- Programme of Activities is appropriate for the Commercial Building sector due to opportunity to aggregate green building efficiency projects.




Green Building Projects Energy Conservation Measures (“ECMs”)

- One of the most significant challenges to generating VERs/CERs from a building efficiency project is that in most cases there is a lack of precedent in the processes. Traditional projects have generally been easier for the development of methodology because there exist significantly more accepted assumptions and defaults factors than for ECM's.








Questions?

Monetizing Carbon Emission Reductions

Kevin James
vice president

Climate Change Capital

- London Based Investment Bank with over \$1.2 billion to invest in greenhouse gas emission reduction
- Most Investments to date made in the Kyoto Market (Developing Countries)
- Begun a US investment strategy including developing projects and buying credits



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Why Are People Investing in Carbon Emission Reductions?

- A carbon constrained World
- Voluntary Market
- Regulatory Market
 - Europe/Kyoto
 - US
- Market Based Mechanisms



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What Does the Carbon Market Look like?

- California
 - California was the first US state to announce unilaterally that it would cut its emissions levels;
 - Cap-and-trade is not specifically mandated in the Global Warming Solutions Act, the Market Advisory Committee set up to deliver recommendations on how to set up a cap-and-trade scheme.



Overview of Regional US Schemes

California and the Western Climate Initiative and Regional Greenhouse Gas Initiative

- Western Climate Initiative (WCI)
 - Six Western states and two Canadian Provinces have agreed to develop a regional framework for cutting GHG emissions, with the aim of developing a carbon trading market. The signatories are Arizona, California, New Mexico, Oregon, Utah, Washington and two Canadian provinces, British Columbia and Manitoba.
 - On 22nd August 2007 six states announced the 'goal' of cutting GHG emissions by 15 % below 2005 levels by 2020. This represents a 33% reduction against business as usual (BAU).
- Midwestern Greenhouse Accord (MGA)
 - Nine mid-western States and a Canadian province have agreed to design an ETS by mid 2010
 - Members are Minnesota, Wisconsin, Illinois, Indiana, Iowa, Michigan, Kansas, Ohio, South Dakota and the Canadian Province of Manitoba



What a Carbon Project might look like in the Building Sector

- Technology Specific Approach (both new and retrofits)
 - Chillers
 - Building Shell
 - Advanced Controls
- Improvement over some base case
 - Beating Average Efficiency of like building space (TCO₂/ft², kWh/ft², etc)
 - Beating Current Building Codes/Standards
 - Energy Star/LEED Certification
 - Upgrading existing performance



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What Carbon Buyers are Looking for

- Clear Emission Reduction Calculation Methodology
 - Direct measurement versus sampling
 - Advantage of Advanced Control Technology
- Additionality
- Minimum Size
 - Bundling
- Third Party Verification



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Specific Steps

- Technical Audit To determine the general scope and cost of opportunity
- Understand the Ancillary Benefits to value of energy cost reductions to clients
- Quantify the value of Carbon Emission Reductions



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Sustainable Solutions for Commercial Real Estate

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Questions?



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