

"Implementing the New Green Business Strategy in the Emerging Carbon Economy"

Babson Energy & Environmental Club
Babson College
March 26, 2009

Peter C. Fusaro
Chairman, Global Change Associates
New York

peterfusaro@global-change.com or
peter@energyhedgefunds.com



ENERGY HEDGE FUND CENTER



**GLOBAL
CHANGE
ASSOCIATES**

Education Breeds Market Liquidity

- 3 Websites with Defined Functions & Free Content
 - ◆ www.global-change.com (Corporate Bill Board)
 - ◆ www.energyhedgefundcenter.com (Online Community)
 - ◆ www.wsgts.com (Wall Street Green Trading Summit)
 - ◆ The Green Salon: Where Artists & Environmental Meet in NYC
- Books Available on Amazon.com:
 - ◆ Free Newsletter, Energy Hedge (go to www.energyhedgefunds.com)
 - ◆ **Cut Carbon, Grow Profits** (Middlesex University Press, February 2007)
 - ◆ **Energy & Emissions: Collision or Convergence** (Wiley, Sept 2006)
 - ◆ **Green Trading Markets: Developing the Second Wave** (Elsevier, 2005)
 - ◆ **Energy & Environmental Hedge Funds** (Wiley, June 2006)

Why It's Different This Time

- Higher Sustained Energy Prices
- More Rapid Technology Shift for Cleantech & Renewables
- The Environment as New Market Driver: The New "Alpha" in investments
- Safe Harbor in a Continuing Financial Storm
- Time of economic pain is time for restructuring the US economy into a green economic engine

Some of the Short Term Problems

- Lack of credit support for renewable project finance
- Cleantech investors sitting on their powder
- Time lag in getting federal monies into sector
- Regulatory uncertainty
- FEAR
- **The Opportunity is Immense: Underinvestment in US infrastructure for Energy, Telco and Water is over \$2 trillion market opportunity**

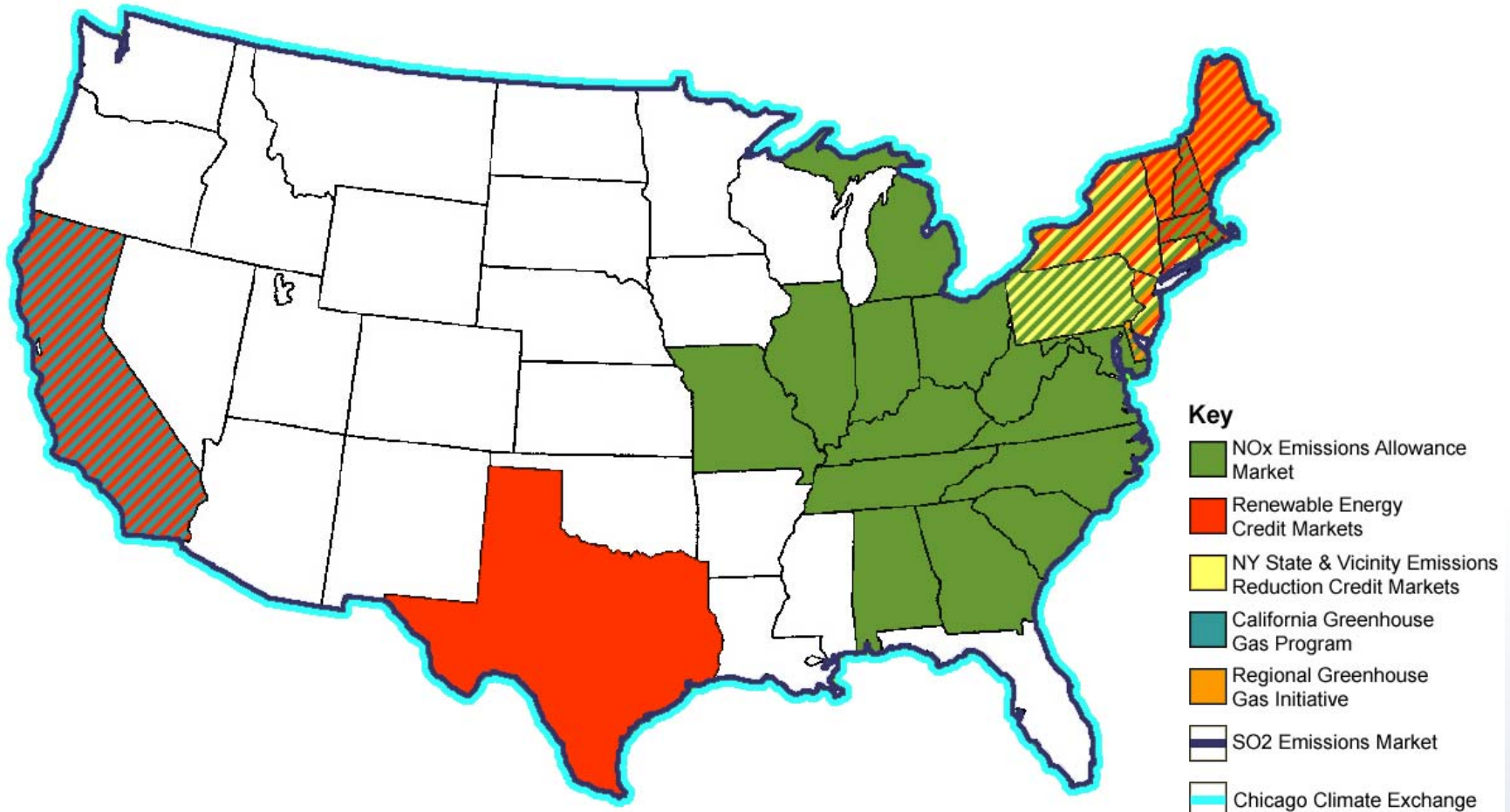
Why Green Now?

- Risen as Corporate Financial Issue
- Banks Now Have “Green Screen”
- Consumers Want Green Power: In US 750 utility green power programs
- EU ETS, Kyoto Protocol & Now US Moving Forward on GHG reductions
- Market-Based Solutions Work
- Key: Regulatory Certainty Provides Financial Certainty for Investments

The Emissions Trading Markets

- \$118 billion CO2 market in 2008 mostly in the EU but could be \$3 trillion commodity market opportunity by 2020
- US carbon market was \$858 million in 2008
- Carbon deficit was growing rising 3.1% annually since 2000 & US and China both have carbon footprints of 6 billion tonnes
- Trading has been shown to be a cost effective tool to reduce pollution and accelerate technology transfer
- Touches all fossil fuel contracts
- Price for carbon is the "missing link" in clean energy and cleantech investment

38 Environmental Financial Markets



In the US, We Make Markets

- Southern California RECLAIM: credits may trade at \$160,000 per ton (currently \$27,000) is oldest in 1993
- Particulate Matter (PM): another compliance market
- Wetlands trading: preserving natural habitat
- SO2 and NOX: well established markets
- Carbon Monoxide
- Carbon Dioxide: both voluntary & compliance
- MERCs (Mobile Emissions Reduction Credits)
- Wetlands Mitigation Credits (\$3 bn Market)
- Look at this as an “Environmental Bank” with multiple streams of credits to warehouse

Introducing The Six Greenhouse Gases

- Carbon Dioxide (CO₂)
- Methane (CH₄) –natural gas (22 times the carbon)
- Nitrous Dioxide (N₂O)- (310 times the carbon)
- Hydrofluorocarbons (HFCs): (11,700 times the carbon)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF₆)
- **The Six Greenhouses Gases are Interchangeable Because of Their Carbon Intensity**

GHG: Why Now?

- Breakthroughs in the US with President Obama
 - ◆ US market Craft federal legislation over next 6 to 18 months of hearings for implementation in 2012 or 2013
- EU ETS Phase 3 will continue European market with renewables & efficiency with less offsets
- Kyoto 2 is under discussion: US will reengage in December 2009
- Need for internationalizing US carbon reductions with other countries regimes (US Senate confirms treaties)
- Price for carbon will ramp up opportunities for technology transfer in the US and abroad

Changing Political Landscape

- “Regulatory certainty” is now gaining traction
- Supreme Court ruling on April 2, 2007 adds more momentum
- Need for longer term energy and environmental strategy
- National RPS, Energy Efficiency & Carbon mandates
- Create New Jobs in Finance, Technology & Engineering

It's Not All Cap and Trade

- National Renewable Portfolio Standards: 10% by 2012, 25% by 2025
- Energy Efficiency Goals and Requirement i.e. decoupling where utilities sell energy efficiency on level playing field with generation, transmission & distribution
 - ◆ \$30 billion in stimulus package for energy efficiency
- Regulation of tailpipe emissions
- Automobile mileage standards (CAFÉ)
- EPA authority for cap and trade is a last resort as subject to numerous judicial challenges
- Carbon pricing as facilitator for renewable deployment

Carbon Market Metrics

- Metric tonne of CO₂ equivalent (CO_{2e}) is a fungible commodity
- Problem is the need for harmonious standards
- US and China are over 40% of global greenhouse gases
- Costs will not be onerous probably \$30 to \$50 per ton:
 - ◆ **Current Price \$1.90 on CCX and 12 Euros in Europe**
- New technologies waiting for deployment
- First steps are to inventory, account and provide certainty of carbon credits
- **Real global market began on January 1, 2008**

Why Price for Carbon is Paramount

- \$4 under RGGI
- \$6 to 10 in California
- Need \$30 to \$50 per tonne
- Material for the balance sheet
- Needs to be **painful** to incent industry to make cleantech investment; otherwise many carbon mitigation techniques go off the table

Beginning of a North American Market Western Climate Initiative

- 11 Western States and Canadian Provinces (Mexican states observing)
- Goal is 15% reduction of 2005 GHG levels to 2020, almost same as California goal of 25% reduction of 1990 levels
- Targeting over 350 million metric tonnes of reduction, half from CA.
- Canada's carbon footprint is 1.3 billion tonnes
- RGGI in the Northeast has begun on January 1, 2009
- Linkages are emerging for a regional North American markets to European and Asian markets

Stringency of Reductions: What's On the Table

- Obama Budget: 14% below 2005 levels by 2020 (roughly 1990 levels); 83% below 2005 by 2050
- 2008 Waxman Bill: 1990 levels by 2020 (same as AB 32) and 80% by 2050: bill at the end of March, working with Markey
- Boxer/Warner/Lieberman: 19% below 2005 by 2020 (roughly 5% below 1990 levels); 71% below 2005 levels by 2050

US Carbon Market Design Issues

Several factors will affect the size of the U.S. GHG market

- ◆ **Stringency of cap**
- ◆ **Price cap level (\$12, 22 or 30)**
- ◆ **Length of the regime**
- ◆ **Coverage of trading program (large stationary sources vs. economy-wide)**
- ◆ **Allocation methods (level of grandfathering vs. auctioning)**
- ◆ **Compliance flexibility (domestic offsets/international GHG instruments, limits on use)**
- ◆ **Regulation of Carbon Markets by Regulated Exchanges**

Potential US Program

- US carbon footprint is 6 billion tons
- Program will cover about 82-87% of the carbon footprint of 5.8 billion tons
- Federal legislation will either be 50 or 100% auctioned: than means with at \$20 per ton it will raise \$100 bn in revenue (\$646 bn revenue for 2012-2017)
- At \$30, it would raise \$150 billion
- Deploy of clean energy monies at \$15 billion per year (presently \$2 bn at federal level)

The Carbon Trading Players

- The players:
 - ◆ Brokers and traders
 - ◆ Oil and gas companies
 - ◆ Electricity companies
 - ◆ Industrials
 - ◆ Agricultural producers
 - ◆ Insurance and reinsurance providers
 - ◆ Financial institutions
 - ◆ Governments at all levels
 - ◆ Aggregators for both carbon and recs
 - ◆ Hedge funds, private equity carbon funds & venture capital funds

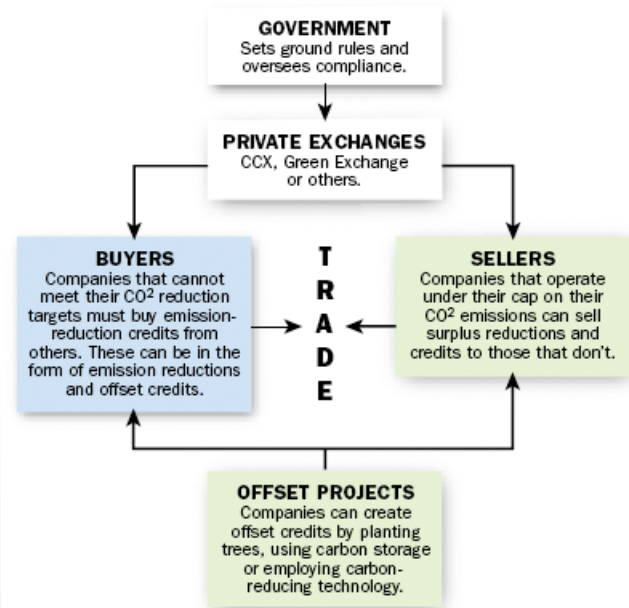
Market Opportunities for Carbon Offsets

- Methane destruction
- Agricultural practices
- Forestry practices
- Renewable Energy
- Clean Development Mechanism Projects under Kyoto
- Other GHG Mitigation such as fuel switching
- Offsets will be 10 to 15% of US Carbon Market

The Climate Exchange Wars

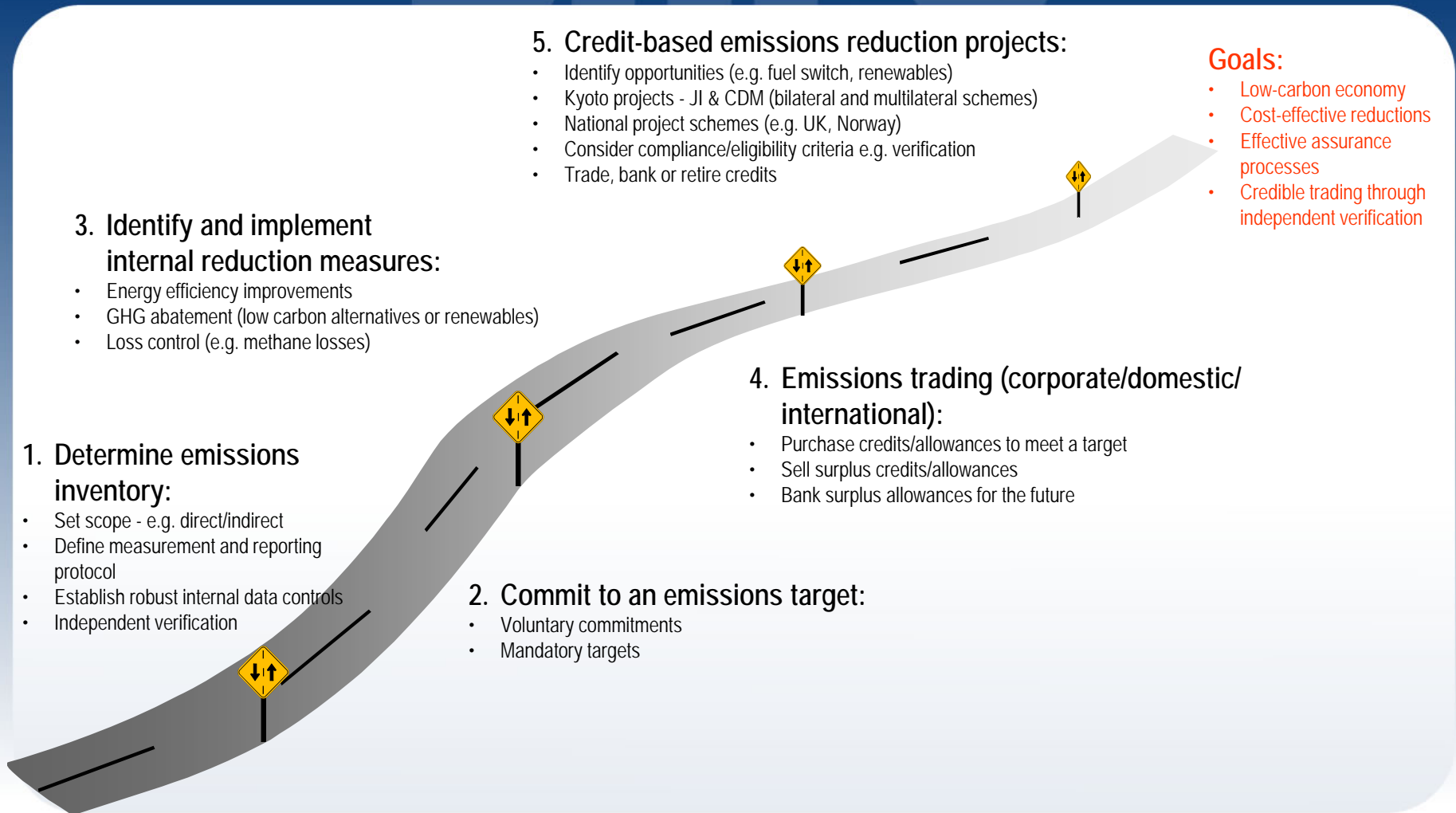
Thinking a Bit Out of the Box

Proponents say that the use of emission-reduction credits will cut overall air pollution, rather than merely shifting it around.



Sources: Chicago Climate Exchange; Barron's

Road Map for Managing Carbon Assets from DNV Certification



The Clean Energy Investment Opportunity is Vast

- **Alternative Energy**
 - ◆ Solar
 - ◆ Wind
 - ◆ Hydro, tidal and wave
 - ◆ Geothermal
 - ◆ Biomass
- **Bioenergy & Ethanol**
- **Distributed Energy**
 - ◆ Combined heat & power
 - ◆ Microturbines
 - ◆ Fuel cells
 - ◆ Hydrogen generation
 - ◆ Flywheels
- **Energy Efficiency**
 - ◆ Lighting
 - ◆ Buildings
 - ◆ Energy recycling
 - ◆ Battery Storage
- **Medical and Biological**
- **Environmental Technologies**
 - ◆ Water and Wastewater Treatment
 - ◆ Coal gasification
 - ◆ Emissions mitigation
- **Information Technology**
 - ◆ Net metering
 - ◆ Demand response
 - ◆ Energy management systems

The Global Opportunity

- Underinvestment in infrastructure in the US and other countries: Over \$2 Trillion for electricity & water in the US alone and many trillions globally
- Energy is World's Largest Business: \$6 Trillion & Growing
- Cleantech Investment was only \$5.18 billion in 2007
- USG R&D was \$2 billion, Energy companies was \$4 billion
- The game is leapfrogging better technologies in the developing world as well as OECD
- Need to deploy capital faster to scale for reductions of greenhouse gases
- **The risk capital is still available**

Investment Constraints Today

- Higher Capital Costs
- Lack of Carbon Price Signal but
- **The Opportunity is Great:**
 - ◆ New, more efficient and greener technologies
 - ◆ Replacing fossil fuels will take decades
 - ◆ Boost for investment due to ability to monetize credits as an “environmental kicker”
 - ◆ New Markets for both developing and developed world

Venture Capital Focus: Up to 10 Year Lock Up

- Solar
- Tidal
- Hydrogen
- Clean Coal
- Fuel Cells
- Cellulosic Ethanol & Algae
- IT Solutions: EMS, Meters, etc.

Hedge Fund Focus: Immediate Returns

- Arbitrageurs (traders)
- Trading carbon and renewable energy credits (RECs)
- Project finance in biofuels, coal gasification and carbon reduction projects (access to credits)

Private Equity Focus Today: Billion Dollar Investments

- Wind
- Hydro
- Geothermal
- Coal to Gas and Coal to Liquids
- Biofuels: Ethanol and Biodiesel

Our Estimate of Energy & Environmental Hedge Funds

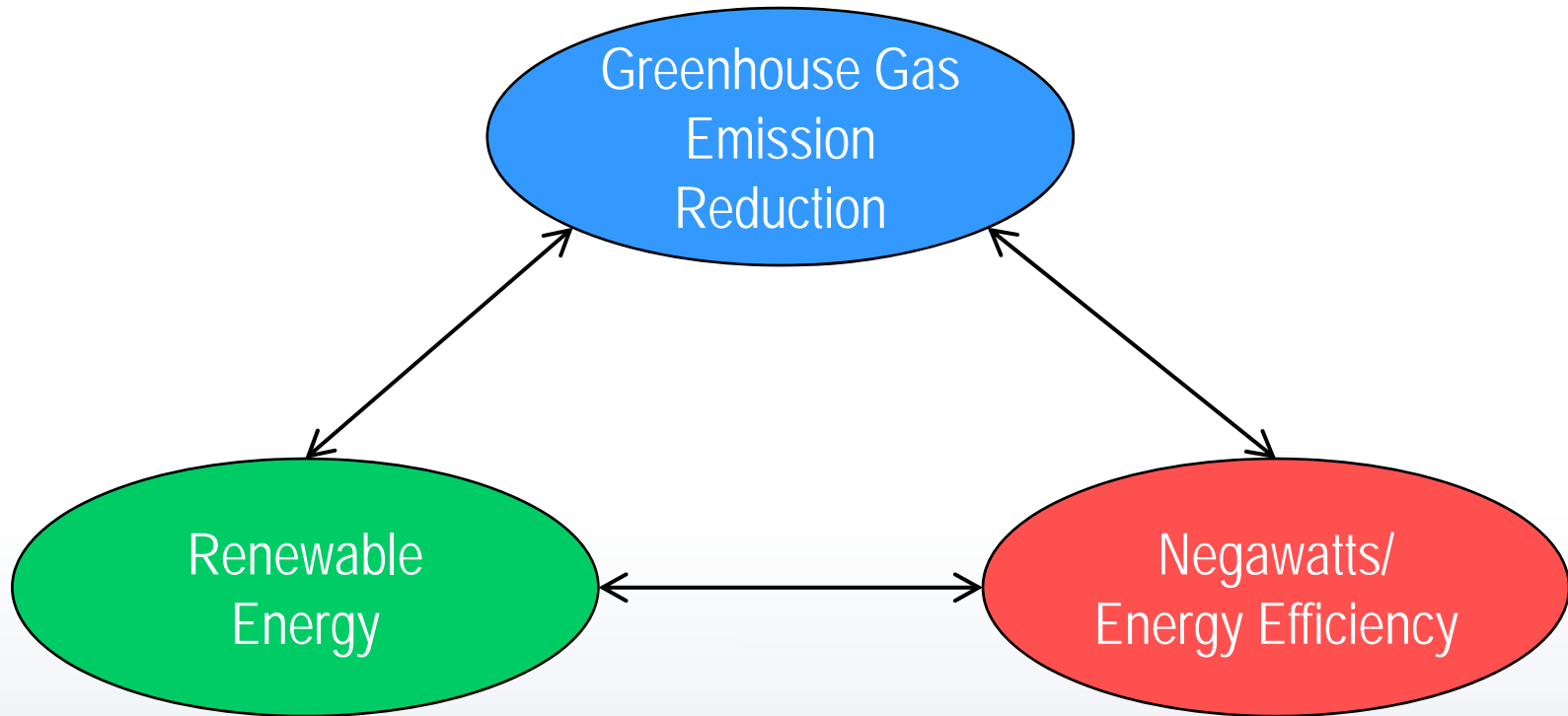
- Over 685 energy and environmental hedge funds
- Over 50 hedge funds trade emissions in the US and Europe
- 87 pure Green Hedge Funds (& rising)
 - ◆ Trading emissions credits and recs
 - ◆ Buying clean energy equities: Over 800 market caps
 - ◆ Investing in private companies
 - ◆ Buying whole projects for credit streams
 - ◆ 10 fund of funds

Source: Energy Hedge Fund Center LLC

New Green Investment Model

- **The New Hybrid Model:** Fund projects with 1 to 4 lock ups, and trade and monetize the streams of credits:
 - ◆ SOx (acid rain) and NOx (ozone)
 - ◆ Carbon credits
 - ◆ Recs (Renewable energy credits)
 - ◆ Biofuels projects and credit trading
 - ◆ Water rights & wetlands credits
 - ◆ Impact: Increase return on investment & reduce cost of capital
 - ◆ **Bottom Line: Add Liquidity to Markets, also price volatility**

Triple Convergence



New Green Screen for Investors

- Emissions control equipment & other cleaner technology
- New metrics for SRI & emerging analytics
- Software for tracking emissions, data management on enterprise level, trading and compliance
- Renewable energy technologies needing greater efficiency and global scale
- Services in advisory, engineering, law and finance

This is the End of the Beginning!

- The problem has been identified
- It's engineering & technology solutions
- Financial solutions are a facilitator in trading and project finance
- Need greater deployment of knowledge to this sector
- Underinvestment for decades globally
- Try to use your imagination to solve the greatest problem facing humanity!

Job Opportunities for Students

- New field called environmental finance and sustainability is now emerging
- In New York: Financial Services
 - ◆ OTC Brokers: Evolution Markets, EcoSecurities, GFI, & TFS Energy, Spectron, ICAP, Amerex
 - ◆ Green Hedge Funds: RNK Capital, Climate Change Capital, Natsource & many smaller ones in New York and London
 - ◆ Cleantech Venture Capital
 - ◆ 4,000 private equity firms
 - ◆ Analysts for Bank Trading Desks
 - ◆ Project Finance: GE Capital & Banks
 - ◆ Law Firms: Duane Morris, Brown Rudnick,
 - ◆ Media: Thomson Reuters, Bloomberg, Cleantech, Greentech

Job Opportunities for Students

- **Bay Area: PE, VCs, Carbon Offsetters & Law Firms**
 - ◆ VC: Kleiner Perkins, Nth Technology, Khosla Ventures
 - ◆ 2,000 private equity firms
 - ◆ Law Firms: Nixon Peabody, Morrison Forrester
 - ◆ Beginning of San Francisco carbon cluster
- **In DC: Public Policy or Consulting**
 - ◆ OMB, EPA, USDA, or DOE
 - ◆ Beltway Bandits: ICF Consulting, CH2M Hill, Pace Global Energy, Point Carbon
 - ◆ Law Firms: Andrews & Kurth, Baker & McKenzie, Baker & Botts, Duane Morris, Alston & Bird, Bracewell & Guiliani, Alston Bird and many others

