



Handbook on Climate-Related Investing across Asset Classes

**Institute for
Responsible Investment**



BOSTON COLLEGE
CARROLL SCHOOL OF MANAGEMENT

Center for Corporate Citizenship

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Climate change is among the most important issues addressed by today's responsible investment universe. Every asset class offers investors an opportunity to pursue climate-friendly investments, to mitigate exposure to climate risk, and to engage stakeholders to improve climate-related performance across the range of investment opportunities.

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Introduction

Responsible investment – understood as the incorporation of environmental, social, and governance (ESG) information into investment analysis – is a discipline that allows investors to:

- Better assess long-term risks and opportunities in their portfolios; and
- Better align their investment strategies with opportunities to create long-term wealth for investors and society alike.

It is a tool for investors who seek to improve long-term financial returns through enhanced ESG analysis. It also appeals to mission or impact investors, who seek to achieve defined social and/or environmental goals while achieving targeted rates of return. In both cases, investors use responsible investment as a tool to improve their ability to achieve their goals.

Climate change is among the most important issues addressed by today's responsible investment universe. The physical risks of climate change, the likelihood of major changes in political and regulatory investment environments as a result of climate change, the opportunities associated with a radical global transformation to a low-carbon economy – these issues create far-reaching implications for investors as they make decisions about their investment strategies, and as they evaluate particular fund managers and investment opportunities. New ideas, products, and methods have entered the market to address the long-term implications of climate change.

This short handbook takes as its premise that a climate lens reveals risks and opportunities across all elements of an investor's portfolio. Every asset class offers investors an opportunity to pursue climate-friendly investments, to mitigate exposure to climate risk, and to engage stakeholders to improve climate-related performance across the range of investment opportunities.

Each chapter of the handbook addresses the possibilities for climate-related investment within a specific asset class. As a whole, the handbook is meant to:

- Help investors devise a portfolio-wide climate strategy
- Identify standards and procedures to integrate that strategy into investment management
- Find ways to engage stakeholders to raise standards for all investors

The Institute for Responsible Investment (IRI) hopes this handbook can facilitate efforts by investors, fund managers, and consultants to assess the impacts of climate change on portfolios -- a careful analysis of climate risk and opportunity can add to financial performance over the long-run.

The IRI further believes investors, by supporting climate-friendly corporate practice through their investments, can play an important role in facilitating the necessary transition to a low-carbon economy.

But a word of caution is in order. By no means does the IRI argue that climate analysis is the sole or the most important determinant of investment returns. Investors will always have to examine cash flows, management quality and industry trends – climate is an additional consideration for their work.

Nor does the IRI assert that investors alone can address the overwhelmingly urgent demands posed by climate change. Governments, civil society and consumers must reframe markets so that carbon is appropriately priced, and corporations are not able to externalize costs onto society without consequence. The market alone is incapable of addressing this challenge.

Simply put, the IRI's argument is this: integrating climate analysis into the investment toolkit can be an important step toward creating long-term wealth for investors and society alike. An asset class approach can help identify the tools that can turn good intentions, and insight into future trends, into practical steps for improving performance.

Note: Each chapter of the Handbook features examples of climate-related investment in practice. These examples are for illustrative purposes only, and should not be taken as investment advice.

Cash and Cash Equivalents

Overview: What you can do

- Identify innovative banks with products and services that reduce carbon emissions or mitigate climate change impacts
- Evaluate banks' climate change governance policies
- Encourage banks to join multi-stakeholder climate change initiatives

I. Cash and responsible investment

Cash is part of not only every institution's investment allocations, but its daily operations as well. All institutions do business with their banks, whether it is checking, cash reserves, overnight cash management, long-term investment allocations to cash or other treasury and investment functions. Cash is exceptional as an asset class because it is often insured and typically low-risk and because institutions can interact with their bankers more easily and directly than, say, with the government bodies that issue fixed income or the corporate management of large publicly traded companies.

II. Cash and climate-related investing

Cash plays an essential role in economic development that must occur in order to accomplish sustainability initiatives. For instance, physical improvements such as retrofitting buildings and upgrading the efficiency of equipment benefit the environment, but require upfront capital. For this reason, banks can play particularly important roles in guiding real estate lending that incorporates green criteria. In addition, banks are the crucial mechanism for financing for individuals and entrepreneurs focused, on the local level, on business activities that can mitigate carbon emissions and promote adaptation to climate change impacts.

Banks' chief opportunity to play a positive environmental role lies in their ability to lend to environmentally beneficial projects and programs. The most obvious choice for an institution seeking to place its cash with a bank devoted to the environment is to start a relationship with one of the handful of "green" banks that specialize in environmental lending. But, at the moment, such banks are small and few and far between.

The alternative is to use the direct character of banking relations to engage banks on their environmental lending and operations and let them know that choices on where to bank will be made on the sustainability of their lending practices and operations. Investors can add long-term value through this asset class without sacrificing market-rate returns by considering environmental sustainability when selecting financial institutions.

III. How banks address climate change

Investors may choose to allocate their cash to financial institutions that actively take climate change analysis into consideration. Whether it is on the small scale or large, investors have an opportunity to engage banks on their environmental policies, urge them to improve their practices, and direct their business to those banks that have the strongest environmental records. Assuring that those to whom they lend are avoiding major environmental risks and are incorporating environmental considerations into their operations makes good sense for investors with a climate focus.

Create sustainable environments through their product offerings

Among the universe of banks and credit unions in the United States today are a handful that have made environmental issues a central focus of their mission and institutional activity, while some others have incorporated climate analysis into their day-to-day activities.

Some small banks such as ShoreBank and New Resource bank have decided to integrate environmental sustainability across all of their product lines. Both banks have included improving the environment as part of their overall mission.

More generally, real estate-related financing is an area where many banks, large and small alike, have made particular progress by targeting green lending practices for both existing buildings and new construction. For example they have:

- **Discounted financing opportunities:** Banks may offer discounted lending rates for green construction projects, or discounted closing costs to buyers of energy efficient homes.
- **LEED standard support:** Banks may allow buyers of real estate that is LEED or Energy-Star (or similar third-party standard) compliant to qualify for larger loans on the premise they can afford higher monthly payments due to their energy savings.
- **Retrofitting programs:** Banks may have specific programs in place to provide the necessary funding to retrofit existing public and private buildings with increased energy efficient products. These projects reduce not only the negative environmental impact of the buildings, but also the cost of energy for the building owners.

Wainwright Bank launched the Green Loan™ in early 2001 with the idea of creating a reduced rate home equity loan to finance home solar energy installations. It has since been expanded to include other eligible types of energy efficient home improvements.

ShoreBank issues a credit card that directs half of the card's proceeds toward reducing CO₂ emissions through offsets. The card was issued by way of TCM, which is owned by ICBA Bancard, a subsidiary of the Independent Community Bankers of America. Cardholders may also receive discounts at regional sustainable businesses.

New Resource Bank looks for and makes loans on green projects such as solar panels. The intent of the loan is to make solar ownership simple and cost-effective by saving the homeowners as much on their electric bill as they are paying for the solar panels and energy generation.

Triodos Renewables is a public limited company, owned by more than 4,000 investors who want their money to make a practical difference in the fight against climate change. Its objective is to exploit opportunities in a growing renewable energy market by taking advantage of projects that generate clean, green electricity from renewable sources.

Although selecting a bank with climate-conscious products is unlikely to affect an investor's return either positively or negatively, it can provide systemic support for climate-related investing.

In addition, large banks make large loans to large corporations, and many of these corporations play a major role in the sustainability of the environment. For instance, the utility-related lending that banks provide offers significant opportunities for institutions to incorporate climate-related strategies in their product offerings. Banks may:

- **Reduce exposure to carbon intensive utilities:** Banks may set specific targets to reduce the rate of greenhouse gas emissions associated with the utility portion of their lending portfolios.

- **Target alternative energy projects:** Banks may provide financing for the construction of wind farms, solar energy plants and other carbon reduction projects.
- **Promote carbon trading:** Banks may finance companies that are unable to cut their carbon emissions to purchase credits from companies that pollute less.

***Royal Bank of Canada** financed more than 25 wind farms in Canada, the United States, the United Kingdom and Italy, and runs a US\$50 million Alternative Energy Investment fund overseen by RBC Capital Partners.*

***Bank of America** invested in the services and technology company Field Diagnostic Services Inc. and plans to deploy the firm's energy management system in banking centers across the country. The investment is part of Bank of America's \$20 billion, 10-year environmental commitment to promote sustainability in its operations and through its lending, investing and new products and services.*

***Barclays Capital** is making its carbon trading and risk management expertise available to its larger commercial clients, and is working with the U.K. government on improving Africa's access to global carbon finance and sitting on an expert government group on the future of London's carbon market.*

Address project finance issues

In recent years, substantial pressure has been placed on major investment banks concerning their criteria for making international project loans, such as those to finance the construction of oil pipelines, hydroelectric dams, paper mills and gold mines. To encourage banks to fully assess the environmental risks in these often highly controversial projects, banks have been encouraged to sign the United Nations Equator Principles.

***The Equator Principles** provide a benchmark for the financial industry to manage social and environmental issues in project financing. Signatory banks agree to avoid where possible negative impacts on project-affected ecosystems and communities, and if these impacts are unavoidable, they should be reduced, mitigated and/or compensated for appropriately.*

As climate change strategies increasingly influence investment decision-making, banks will increasingly include exposure to climate risk in their traditional lending *risk assessment*. *Climate-related risks include:*

- Changes in the regulatory environment increasing energy costs
- Threats to corporate reputation from contributions to global warming
- Transformation in consumer demand from more climate-aware individual and institutional consumers
- Changes in resource prices due to altered weather patterns

***HSBC**, a signatory of the Equator Principles was recently publicly praised by the Rain Forest Network for its announced review and withdrawal from some high-risk, carbon-intensive investments such as tar sands expansion in Canada, and deforestation in Indonesia and Malaysia.*

Banks may require loan candidates to disclose their carbon emissions, assess possible carbon reduction costs, and encourage carbon mitigation plans. They may also review their entire loan portfolios, and report on climate risk and opportunity in their annual communications with investors and other stakeholders.

*French Bank, **Caisse d'Epargne**, launched a labeling system in June 2008 that ranked its products according to financial risk and sustainability, with the environmental effect of the products being a key indicator in the ratings. The methodology was developed by the consultancy **Utopies**, with stakeholders including French environmental NGOs **Les Amis de la Terre** (Friends of the Earth France), **WWF** and French environment agency **Ademe**.*

At the same time, many banks, even those actively promoting their green activities, hold loans to corporations in their portfolio with high levels of greenhouse gas emissions. Investors can encourage these banks to enter into communication with these clients.

Manage their own facilities

Investors may also wish to consider how banks and other financial institutions account for climate risk in their own operations. Though banks are not themselves particularly carbon-intensive in their operations, the public and regulatory attention to climate change has led to heightened attention from senior executives at many institutions, and consequently to robust environmental programs addressing corporate operations. Banks may:

- Use green alternative energy technologies in their offices and branches
- Purchase carbon offsets to mitigate their own emissions
- Commit to meeting uniform green building standards for construction and renovation of their facilities
- Implement waste management systems to reduce waste production
- Set targets for achieving carbon neutrality worldwide

Although the footprint of banks may not be as large as that of other institutions to which they lend, operations management may be a sign of management's attention to the issue. One key area where banks have taken the lead is in new construction of corporate offices. Banks have adopted external standards such as the United States Green Building Council's Leadership in Energy and Environmental Designs standards (LEED), Building Research Establishment's Environmental Assessment Method (BREEM), and the U.S. Environmental Protection Agency's Energy Star, in construction of the central offices, both for operational savings but also to promote their corporate reputation as environmentally sensitive corporate citizens. Investors can also use their banking relationships to engage banks on the question of whether operations management is a real sign of climate risk management, or an attempt at greenwashing an institution's reputation.

*As of October 2008, **PNC Bank** had 55 buildings that were LEED certified. Their most recent addition of such buildings made them the owner of the most LEED certified buildings in the U.S.*

IV. Banks and climate engagement policies

Investors wishing to place their cash investments with banks that have chosen progressive environmental policies and practices may take into account how banks:

- Address climate risk and opportunity in their lending portfolios
- Develop climate-conscious initiatives through their product offerings
- Mitigate the climate impacts of their own operational activities
- Take leadership in stakeholder and other forums on climate-related issues.

Financial institutions can be encouraged to support multi-stakeholder efforts to integrate climate analysis into the investment community.

For instance, large financial institutions may use their influence beyond their specific lending policies by:

- Advocating for policy changes that support greenhouse gas reduction initiatives and require improved corporate disclosures of climate risks
- Voluntarily adhering to globally recognized sets of principles or codes of conduct that focus on environmental issues
- Transparently reporting on their environmental practices
- Partnering with NGOs focused on environmental issues

There are many opportunities for banks to publicly display their awareness of environmental issues and demonstrate the priority they have put on climate change. Investors may seek to identify banks that have done as such.

Credit Agricole, HSBC, Munich Re, Standard Chartered and Swiss Re voluntarily agreed to adopt the best practices called “*The Climate Principles*.” The code was developed in conjunction with the nonprofit ***Climate Group*** and is intended as a guide to help financial and insurance institutions manage climate change across a broad section of services and products

When choosing to create new banking relationships, investors can review which institutions have committed to stakeholder engagement. But they can also use their banking relationships themselves to engage with and encourage their banks to adopt climate-related policies and procedures.

V. Evaluating banks through a climate lens

Subscriber-based rating services are available that provide independent research of banks covering a variety of areas. Investors may want to read reports and make banking decisions according to their individual climate change criteria.

***KLD Research** provides clients with an extensive database called Socrates that measures the social and environmental performance of corporations. Users can analyze in-depth company specific profiles evaluating how they perform against certain indicators.*

***Innovest Strategic Value Advisors** conducts a variety of non-financial research on companies. Their retail banking sector report has a detailed analysis of non-financial trends and best-practices that may be useful to an investor.*

Many NGOs are making efforts through research and promotions to encourage green banking.

***Ceres'** recent publication "Corporate Governance and Climate Change: The Banking Sector" analyzes the corporate governance and strategic approaches of the world's 40- largest banks to the challenges and opportunities climate change poses.*

There are a variety of ways financial services companies can help channel cash to community development banks and credit unions. For example, Domini Social Investment's Money Market Account with ShoreBank. Through this account, Domini has placed \$55 million directly with ShoreBank through this fund.

***TIAA-CREF** made \$22 million of deposits with ShoreBank and Shore-Bank Pacific through multiple certificates of deposit. ShoreBank uses cash deposits as such to provide financing and information to individuals, small businesses, nonprofits and foundations while encouraging energy-saving green designs.*

Overview: What you can do

- Set standards for fixed-income investments for climate-related performance
- Target bond issues that support public and private alternative energy investment, and climate-sensitive infrastructure development
- Join with other investors to catalyze growth in a secondary market for debt that supports climate change solutions

I. Fixed-income and responsible investment

Fixed-income investments are typically seen as a safe, low-risk core asset class for investors ranging from large institutions to the retail market. The fixed-income asset class is enormous, consisting of bonds and other short- and long-term, fixed return debt instruments issued by the government, and to a lesser extent corporations and large NGOs (We do not here address the complex universe of “innovative” fixed-income products of varying and sometimes wildly mispriced risk). These investment opportunities may be issued to finance specific projects or general activities.

Types of products

For the purposes of this report, fixed-income can be broken down into three basic types of products, for each of which a different approach is available to investors seeking to address climate change and other overarching environmental issues of the day.

- Revenue bonds are issued to fund particular projects and are backed by the revenues generated from those projects.
- General obligation bonds are issued to fund the general activities of the issuing body — be it a government, corporation, or other large entity needing to raise cash. These bonds are backed by the general funding of the organization in question. In the case of governments, this means taxes.
- Asset-backed securities are bonds backed by particular assets that generate a regular stream of revenues — such as mortgages, business loans, credit cards or leases — and issued by government agencies, banks or other private financial organizations. .

From the responsible investment perspective, fixed-income products play a crucial role: they provide the debt financing that supports the creation of public goods and large infrastructure projects such as transportation systems, alternative energy generating capacity and climate change mitigation strategies. Fixed-income products also may offer a targeted geographic focus, which provides investors with the opportunity to support economic activity that benefits their communities.

II. Fixed-income and climate change

Much of the task of addressing climate change issues requires investments that are best funded through the fixed-income market. In particular, long-term, large capital investments by business and governments require upfront capital often raised in the fixed-income markets. In addition, many investments by government, funded out of general revenues also raised through the sale of bonds, fall under that broad category of public goods, such as transportation infrastructure, energy-related tax subsidies, and research and development underlying technological advances in clean energy, energy efficiency and other new technologies.

For example, while the initial development of innovative alternative energy technologies that can compete on price with fossil fuels can be left to the venture capitalist, when it comes to bringing these technologies to scale, massive investments in capital will be necessary — the kind of investments that capital-intensive industries such as electric utilities have traditionally turned to the fixed-income market to fund.

Fixed-income investments are often exposed, for a variety of reasons, to climate-related risks, and over the long term investors will benefit from using climate analysis to determine their exposure in sectors as various as agriculture, transportation or real estate.

Fixed-income investors concerned with the environment can therefore evaluate the environmental implications of the projects being funded, the environmental policies and practices of the corporation, government or other large entity being funded, and environmental implications of the assets behind asset-backed securities.

III. How fixed-income investments address climate change

A number of opportunities exist for responsible investors to identify fixed-income securities that address climate change. Investors can use climate analysis to target products with exceptional potential for generating sustainable energy, reducing carbon emissions or mitigating climate impact. Their investments may support either public or private investment in renewable energy production.

Fixed-income investors can review the specific projects funded by revenue bonds, while government bond offerings can target infrastructure or other projects including alternative energy, green construction and support for basic research into new technologies.

*Missouri's Saline County commissioners approved the issuance of \$141 million of the county's industrial development revenue bonds to finance alternative energy. **EcoAlgae USA** will contract with **Green Star's** Associated Consortium of Companies to construct an Algae-to-Biodiesel and Next Generation Waste-to-Energy Complex.*

*The **Public Service Commission of West Virginia** oversaw the offering of a \$459.3 million bond sale in what it called the "nation's first environmental control bond issue." The proceeds of the sale were earmarked to purchase environmental control equipment to reduce power plant emissions responsible for smog and acid rain.*

*The Berkeley (California) City Council approved the **Berkeley FIRST Solar Financing Program**, a loan program that pays upfront costs of installing solar power in city businesses and residences. The loan is structured so that property owners can pay back loans over 20 years as part of their property taxes, and in theory fund their repayments through lower electric bills over that period.*

*In 2007 the **European Investment Bank** initiated a **Climate Awareness Bond** through which close to \$2 billion has already been raised for renewable energy projects. The five- year guaranteed bonds pay no coupon, but return 100 percent of the capital at maturity plus a return equal to an upside percentage of FTS4Good Environmental Leaders Europe 40 Index or minimum 5 percent.*

*The **European Bank for Reconstruction and Development (EBRD)** borrows funds in the international markets by issuing bonds and other debt instruments at highly cost-effective market rates. The EBRD has committed 1.7 billion euros to the Sustainable Energy Initiative it launched in 2006 to address the wasteful and polluting use of energy.*

In addition, investors can look through their investments in general obligation bonds to the general environmental policies and practices of the issuing institution. In the case of corporate bonds, this means favoring the debt of companies with stronger environmental records. A similar approach might be taken at the level of political geography, with investors evaluating the climate risk of government bonds issued by countries based on the relative scale of their climate-related public policies.

It may be possible for fixed-income investors, individually or collectively, to actively seek out the creation of bonds that would have environmentally positive stories. In the area of community economic development, the F.B. Heron Foundation approached the U.S. Small Business Administration to create a pooled security that was backed by loans to women- and minority entrepreneurs. An analogous request could be made of government entities (i.e. Fannie Mae and Freddie Mac) to create securities backed by loans to LEED-qualified or Energy STAR-rated buildings or otherwise notably energy efficient projects. By doing so, investors could encourage the creation of climate-related disclosures and define standards for such products more broadly.

Community Capital Management (CCM) seeks bond products that are environmentally friendly to purchase on behalf of their clients. For instance, CCM includes in its portfolio bonds from the Community Redevelopment Agency of the city of Los Angeles, which were issued to finance local redevelopment projects that reflect their commitment to build green and sustainable communities.

Bonds used to fund eco-business or to micro-lending, and economic development projects that take climate risk into account, may be similarly attractive to investors in the global development space.

*As part of an initiative it hopes will result in new investment in low-carbon technology in the developing world, the **World Bank** has issued its first “green bond” in partnership with the Swedish bank, **SEB**. All proceeds to the World Bank will be used to finance projects, such as wind farms and solar parks, that cut carbon dioxide emissions in the developing world.*

IV. Evaluating fixed-income products through a climate lens

If fixed-income-investment returns are likely to change in response to climate-related changes in the political, regulatory, and consumer environment, investors may want to identify governmental and corporate bond issuers that are taking climate risk into account before making their financing decisions. Investors can ask issuers how they:

- Use climate risk analysis to better anticipate the expected performance of fixed-income products
- Identify fixed-income products that take advantage of the changes in the investment landscape brought on by climate change
- Support and promote fund managers and bond issuers that are publicly involved in raising awareness of climate-related issues

For instance, mortgage values for residential properties that are not energy efficient themselves or that do not have easy access to sustainable transportation may decrease due to rising carbon prices, and therefore may underperform over the medium- to long-term. Similarly, the long-distance shipping sector may take on similar risk because of climate-related regulations. For investors considering these and other sectors, climate analysis can enhance traditional decision-making about the value of fixed-income products.

One obvious difficulty in incorporating climate risk analysis is the lack of standardized and regulated reporting on the issue. Institutional investors may wish to use their influence and relationships with fund managers to request climate risk analysis along with traditional financial reporting.

Institutions may also add carbon disclosure and mitigation requirements to their traditional client review process, as a means to integrate climate analysis into the traditional investment decision-making structure.

*At **Citigroup**, all bonds it issues in excess of \$50 million are subject to its Environmental and Social Risk Management (ESRM) Policy. The ESRM Policy was developed in 2003 to address environmental and social issues from a credit, reputational, and franchise risk perspective.*

Public equities

Overview: What you can do

- Target companies or funds that focus on alternative energies or reductions of climate change impact
- Advocate improved corporate performance related to climate change through dialogue, proxy voting and shareholder resolutions
- Join investor networks to leverage shareholder advocacy for change

I. Public equities and responsible investment

The public equities market consists of the publicly traded stocks of large corporations traded on regulated stock exchanges. Equities represent ownership in these corporations and are therefore associated with rights that allow investors to influence management. They are ideal for working toward incremental change in areas of current concern posed by large corporations.

As an asset class, equities are particularly well suited to facilitate dialogue on long-term wealth creation generally. Responsible investors can share knowledge with, and provide feedback to, large corporations on the social and environmental risks and rewards they create. Through this feedback, investors can work to bring about change in corporate behavior that contributes to the creation of a sustainable economy and society.

II. Public equities and climate change

For investors concerned with the issues of climate change and environmental sustainability, public equities have perhaps received the most attention. Responsible investing in equities has focused both on using climate analysis to better assess long-term financial performance, and on using the tools of shareholder advocacy to engage companies on climate change issues material to long-term performance.

Because information is publicly available on these corporations, investors can review their equity holdings for exposure to regulatory, reputational, environmental and other risks associated with climate change. Also, formal mechanisms exist that allow, and even from the perspective of fiduciary duty encourage, investors to engage companies on their climate impacts. Moreover, climate-related stock-picking strategies and engagement serve to keep the climate change debate in the public eye and so support the development of sound public policy and governmental action.

III. How public equity investments address climate change

Concerned investors can use a combination of three tactics when it comes to addressing climate change in the equity portion of their portfolios. They can:

- Choose to invest in companies with superior records on climate change and the environment;
- Engage with companies that they hold on climate change and environmental issues.
- Join in investor coalitions that elevate the climate change issue to the level of public policy and governmental action.

Stock selection

Companies are increasingly communicating environmental performance against determined indicators, reporting their emissions as well as their policies and strategies to reduce their carbon footprint. They are also increasingly addressing concerns about their public policy stances on climate change and carbon emissions.

Many corporations have seen the reputational benefits of touting their commitments to the alternative energy and energy efficiency markets, though the practice of greenwashing remains a persistent problem. Research agencies are addressing this problem through creative uses of public information to evaluate performance in climate-related areas. In short, there are many well-developed opportunities to integrate climate analysis into public equity investments, and a relatively sophisticated set of tools to do so.

Investors can determine on a company-by-company basis not only what their exposure to climate change risk may be, but also how they are positioned in relation to sectors for growth such as alternative energy, transportation, energy efficiency and carbon-risk mitigation products or services. Investors may also look to identify companies that are assessing supplier relationships, procurement processes and shipping systems with the understanding that shifting their operations to more environmentally friendly options also increases their chances of success. Similarly, investors may specify how their fund managers consider climate-related issues, and include these criteria in their choices of fund managers.

Specialized climate change portfolios

Investors may select specialized climate-change-related sectors to target as part of an actively managed fund. These could include renewable energy, energy efficiency or waste management, but also issues more tangentially related such as water and infrastructure investments.

NASDAQ® Clean Edge® U.S. Liquid Series Index tracks the performance of companies that are best able to demonstrate their ability to take advantage of growth potential in the clean energy sector. The companies must be classified as technology manufacturers, developers, distributors or installers in a defined set of sub-sectors (Advanced Materials, Energy Intelligence, Energy Storage & Conversion, or Renewable Electricity Generation & Renewable Fuels).

Pictet Clean Energy Fund invests in companies that contribute to and profit from a transition to more environmentally responsible energy consumption. The fund also invests in companies that contribute to reducing energy demand through implementing efficiencies in their own energy consumption.

Calvert Global Alternative Energy Fund capitalizes on increasing demand for alternative energy as a result of climate change and changing regulations. Its target portfolio allocation is primarily made up of wind energy, solar energy, biofuels and fuel cells.

Pax World Global Green Fund primarily invests in companies that focus on mitigating climate change. It selects equities in areas such as alternative energy and energy efficiency, water treatment, waste technology and resource management.

Traditional portfolios through a climate lens

Many investment management firms provide investors with opportunities to buy shares of funds that have integrated climate risk into equities risk analysis. Traditionally done by boutique investment firms, larger institutional money managers are now also providing these products.

Investors may choose from the various investment strategies. They may:

- Integrate climate analysis on a company by company basis;
- Use best in class indicators to identify outstanding performers in industry sectors;
- Target companies and industries poised to take advantage of opportunities presented by climate change;
- Identify funds that are broadly diversified by climate-related themes and industry sector;
- Weight whole portfolios to take into account sectoral exposure to climate risk.

*The **KLD Global Climate 100 Index** encourages investment in 100 companies with the most promising potential to mitigate both short- and long-term causes of climate change. The index looks for opportunities in renewable energies as well as energy conservation and pollution prevention.*

***KBC Asset Management** takes a “pioneer approach” to environmental investment by focusing on companies where the majority of their business is solutions based. The Environmental Advisory Committee, in cooperation with the Eco Fund team, determines the composition of funds based on specific environmental themes.*

***Allianz RCM Global EcoTrends Fund** and **Neuberger Berman Climate Change Fund** combine both a “best in class” and “clean company” strategy and look broadly at environmental issues.*

A “best-in-sector” approach uses external indicators based on climate change concerns to rate and rank companies on their climate change or sustainability performance. Most best-in-sector methodologies only permit investments in companies that score highest relative to their peers in a given sector.

***Winslow Green Growth Fund** seeks capital appreciation through environmental investing. It relies on a best-in-sector assessment process to select companies within green market sectors as well as environmentally responsible companies across all sectors for its portfolio.*

Portfolio review for exposure to climate and sustainability risks may become increasingly relevant for investors. In the same way that, in 2007-08, securitized mortgage holdings masked exposure to an unseen risk of default, many of the world's investors own shares in companies with substantial exposure to climate-related risk. Risks to corporate reputation, profits and long-term performance are likely to increase as governments, consumers and competitors come to terms with the necessary changes to be brought about by climate change adaptation and mitigation policies.

***Trucost** is an environmental research organization that works with companies, investors and organizations to understand the impacts companies have on the environment. In particular, Trucost measures and tracks corporations' carbon emissions exposures. Trucost has produced three public studies that demonstrate how the carbon footprint of an investment portfolio can be measured.*

Research on corporate climate-related performance

A number of research studies and tools are available for those interested in climate-change-related public equity investment. These highlight a variety of issues including:

- Volatility in sectors known to have high carbon emissions
- Risks to sectors due to the effects of climate change
- Likely impacts of new regulations, carbon pricing or climate-related litigation on long-term earning
- Potential impacts on corporate reputation due to changes in consumer sentiment

*The consulting firm **McKinsey & Company** has a research group devoted to energy markets and that has published a number of reports on the topic of carbon risk, alternative energy and climate change.*

***J.P. Morgan** released a report outlining its strategy toward making investments in alternative energy. The report discusses its assessment of the demand and cost of production for several alternative energy sources. Similarly, **Deutsche Bank** has published a series of articles addressing the potential for climate-related investment in the public equities space. These are merely two of many examples in the market.*

*Innovest has rolled out a tool called the Carbon Beta Risk Assessment Platform that helps climate conscious investors assess their risk in carbon-exposed businesses or in a particular sector. **EIRIS' Carbon Risk Factor** helps to quantify a company's climate change performance based on impact and management response to provide an overall climate change rating. **KLD Research and Analytics** maintains the comprehensive database **Socrates**, which measures the social and environmental performance of corporations. Users can draw on the database to screen and monitor their portfolios, create buy or restricted lists, or track shareholder resolutions.*

IV. Active ownership through a climate lens

Public equities offer investors specific opportunities to use their rights as shareholders to engage with companies directly on climate issues. Advocacy can range from corporate dialogue, to voting on proxies on shareholder resolutions, to filing shareholder resolutions themselves. Many times, this advocacy is most effective when done in collaboration with other investors. Multistakeholder groups have joined together to encourage more transparency around carbon emissions and climate risk from publicly traded corporations.

Shareholder advocacy

Shareholder advocacy offers investors multiple benefits, including the ability to:

- Raise material issues they feel that the companies they own may not be addressing sufficiently;
- Address important climate change issues that will benefit not merely the companies they own, but also other companies they hold in their portfolio;
- Raise systemic, economy-wide issues on the role of corporations in society for public debate.

Creating relationships and engaging in dialogue with board members and top executives can raise awareness for climate risk issues at companies. Companies have been asked to publish climate change strategies, report on their carbon emissions, benchmark performance against peers, and explain activities that seem to run counter to long-term climate considerations. They have also been encouraged to adopt governance structures to enable more effective oversight of climate-related activities.

As they engage with corporations, investors themselves may wish to formalize their climate-related proxy voting guidelines, or to develop in-house or purchase research related to climate change to inform their activities and guide their proxy votes.

Investors, particularly in the United States and Canada, have the opportunity to file shareholder resolutions if initial dialogues with companies are not well received. This involves drafting the resolution in a format that will address the shareholder concerns in a manner approved by the SEC. Frequently, resolution filers join together to craft the resolutions. Resolutions often serve as tools of engagement, and may be withdrawn if companies are seen as responsive to investor concerns.

*Resolutions filed at Ford Motors by the **Connecticut State Treasurer's Office** and several other institutional investors were withdrawn after Ford agreed to provide a detailed plan of how it intends to reach the goal of reducing the greenhouse gas emissions from its new vehicle fleet by at least 30 percent by 2020.*

***Trillium Asset Management** and **Green Century Capital Management** are pioneering the first oil sands resolutions at ConocoPhillips and Chevron. The extraction process for oil sands requires greater water and energy than ordinary oil drilling, preventing Canada from meeting its Kyoto Protocol commitments. The resolutions press the two companies to disclose the environmental damage that will result from their expanding oil sands operations, and the subsequent impacts the increased greenhouse gas emissions will have.*

Actively participating in investor networks creates an opportunity for investors to take action even if their resources are limited. Investors can learn from each other about how climate change might affect their investments and have access to a forum to discuss best practices. The groups also may serve as a platform to gain momentum for shareholder resolutions.

The Carbon Disclosure Project (CDP) is an investor coalition representing 385 international institutional investors with \$57 trillion in assets under management as of late 2008. Through the promotion of an ongoing dialogue between institutional investors and senior corporate management in relation to climate change, CDP encourages private and public sector organizations to measure, manage and reduce emissions, engaging more than 3,000 companies in 2008 on climate-related reporting.

A project of Ceres, the **Investor Network on Climate Risk (INCR)** is a U.S.-based network of institutional investors and financial institutions representing more than \$6 trillion of capital that promotes understanding of the financial risks and opportunities climate change poses.

The **Interfaith Center on Corporate Responsibility** is a group of faith-based institutional investors whose members pressure companies to be socially and environmentally responsible in the United States. The Center sponsors shareholder resolutions on major environmental issues every year.

ProxyDemocracy.org provides tools to help investors use their voting power to promote changes in the companies they own. They help shareholders vote their shares by publicizing the intended votes of institutional investors with a record of shareholder engagement. The site helps mutual fund investors understand the voting records of leading funds. This may lead investors to purchase funds that best represent their interests and pressure those that do not.

The United Nations Environment Program Finance Initiative (UNEP FI) works closely with more than 160 financial institutions that are signatories to the UNEP FI Statements, and a range of partner organizations to develop networks between the environment, sustainability and financial performance. Through its Climate Change Working Group, UNEP FI focuses on carbon finance, national and international policy and regulation debates, and renewable energy.

Public Policy

Investors can engage with government bodies to stress the importance of climate-related issues, and work with policy makers to publicly promote most efficient means of addressing greenhouse gas emissions, mitigating climate impacts and adapting to likely climate change. Whether by asking regulatory bodies to require climate risk disclosures as part of their regular filing, or by calling on legislative bodies to create federal climate regulation or energy efficiency policies, investors can use their voice to support effective action. In each case, public policy advocacy requires careful consideration of the specific issue in question in combination with broad, long-term analysis of the effects that climate change will have both on investors and society at large.

*In March 2007, **Ceres** and **INCR** organized a group of more than 60 leading investors, asset managers and companies that together managed more than \$4 trillion in assets. They released a climate policy call to action requesting fast, tangible action by U.S. lawmakers to tackle global climate change. Included in the petition was a call for the Securities and Exchange Commission to clarify what companies should disclose to investors on climate change in their regular financial reporting.*

*The United Nations Environment Programme Finance Initiative recently launched the **Green Economy Initiative** aimed at mobilizing and refocusing the global economy toward investments in clean technologies and “natural” infrastructure in order to combat climate change and create new jobs.*

Climate-related investment is intimately linked to the price governments are going to put on carbon in order to capture the externalities it imposes. Investors may wish to engage in the debate to determine the most effective and efficient way to work necessary carbon pricing into the market.

Private equity

Overview: What you can do

- Focus on investments that provide innovative products and services for greenhouse gas mitigation and climate change adaptation
- Identify risks to private equity investments from changing physical, regulatory and consumer environments
- Actively engage, through direct ownership stakes or through private equity intermediaries, in designing climate-aware business and investment strategies for investee companies

I. Private equity and responsible investment

Private equity – particularly venture capital – plays a special role in enabling the growth of specific forms of economic activity. These investments may take place at various stages of a company’s life cycle, from early stage venture investments to the purchasing and delisting of a publicly traded company. Investors may invest in private equity through conducting their own transactions or as a limited partner of a private equity fund. When making such an investment, a limited partner places the active ownership interactions with the general partners. Due to their financial structure, private equity investments are usually only available to institutional investors or high net worth individuals.

While private equity investments focused on restructuring and resale have been criticized for short-termism, at their best, private equity and venture capital have a long-term focus. A long-term time horizon offers responsible investors the opportunity to help shape a private equity market which rewards wealth creation across the triple bottom line. The long-term commitment of these investments ideally heightens the materiality of environmental, social and governance factors to financial return. Private equity investment may also offer investors the ability to take active roles in the orientation of investee business practices.

II. Private equity and climate change

Investors can choose to seek private equity and venture capital funds that take investment in renewable energy or energy efficiency as part of the climate change solution, and so look to invest in portfolio companies focused on developing clean technologies. Investing in these funds may put investors into the early stages of a promising economic shift to clean technology, and the investment may also itself promote research and product development that expedites

that shift. As in other asset classes, private equity investors will also want to address the risks that climate impacts in the future may have on their portfolio, whether from exposure to new regulations or to climactic impacts that change consumer demand.

Although investing in a company at its earliest stage increases financial risk, investors at this stage have more scope to influence the environmentally sound operating policies and procedures, reducing future climate risk which may perhaps even mitigate some of the financial risk incurred by investing in the early stage. Private equity investments generally, and venture investments in particular, also provide the opportunity for investors to specifically direct companies toward climate-friendly business practices.

III. How private equity investments address climate change

Investors may focus on a variety of factors when determining a climate-change-related investment strategy for private equity. Particularly popular approaches are:

- Conducting an analysis of the environmental impact of the investment company's products;

Massachusetts Green Energy Fund seeks to invest in Massachusetts-based renewable energy companies able to achieve strong financial returns. Potential investments include solar photovoltaic power, wind power, biomass, biofuels, fuel cells and other enabling technologies that promote the expanded use of renewable energy.

*Investing in companies at the seed, start-up, growth and expansion stages, **Good Energies** uses a long-term investment strategy and diversifies its alternative energy investments across wind, solar, green buildings, and energy efficiency.*

- Assessing how the business operations of the investment company are conducted in order to improve environmental sustainability;

***US Renewables Group** is converting a coal power plant in New York State to wood biomass, and sees potential for further conversions of similar plants in the U.S.*

- Targeting investments that will help catalyze growth in an entire industry such as clean energy.

*California's venture capital community saw economic potential to assist the state in its efforts to reduce carbon emissions and has worked closely with the state to help fund solar rooftops, deploy infrastructure for fueling hydrogen cars and earmarking funds for aggressive energy efficiency programs. For example, after venture capital firms **Khosla Ventures** and **Kleiner, Perkins, Caufield & Byers** (KPCB) provided funding to Ausra, a developer of utility-scale solar power technology, the company entered into a 177 megawatt solar thermal power purchasing agreement with **Pacific Gas and Electric Company**.*

- Create a pipeline through requests for proposals (RFPs).

Large investors may write requests for proposals specifically stating the form of environmental benefits most relevant to them. The RFP may identify the types of products, specify policies, or require certain disclosures. By doing this, investors are given the freedom to set their own terms of climate-related investment strategy.

Private equity investors should remain cautious of the effect market volatility may have on their investments. As the promise of uncertain new technologies, and the dynamic value assigned to carbon and other emissions, is priced into the market, private equity investments may experience swift movements of capital.

The recent experience of investments in ethanol as an alternative fuel, with rapidly changing calculations of carbon emission reductions, points out challenges in the field. The important social problems associated with corn ethanol

and its relationship to higher food prices, for instance, offers a cautionary tale of climate-related investment enthusiasm and a case study in the complex nature (and value) of integrating environmental, social and governance information into investment decisions.

IV. Evaluating private equity and venture capital investments through a climate lens

While private equity poses high risk due to uncertainty and the absence of a liquid market for shares, considering environmental factors in private equity investments can add long-term value to the asset class. As noted, time horizons are necessarily crucial in climate-related investing. Private equity investors may develop a climate-related due diligence process at an early stage of investment analysis, to better determine the long-term impacts of climate change on potential investments.

For instance, a climate change analysis may be applied to assess:

- The impact of carbon emissions' exposure on future costs
- Changing regulatory and subsidy structures affecting the company's competitive environment.

Specifically for green companies, areas to consider include:

- The large amount of capital needed for clean technology companies to get off the ground
- The need for clean technology companies to differentiate themselves in the rapidly growing field

Investors may collaborate with each other to form networks that use private capital to promote sustainability. This allows the climate conscious investor to pay close attention to developing a channel of potential investments. Joining these networks may result in co-investments or other types of collaboration to further the investors' missions. (In some cases, a fund of funds may perform a similar service, giving investors exposure to a broader range of products). Networks may also work to encourage entrepreneurs to focus on developing businesses with high-impact environmental missions.

***The Environmental Defense Fund and Natural Resources Defense Council** brokered an agreement with private equity giant **KKR** and the **Texas Pacific Group** to back their investment in TXU in exchange for their pledge to reduce carbon emissions and throw out plans to build coal-fired power plants.*

V. Private equity and stakeholder engagement

Investors can use their position to influence management or seek to invest in funds run by firms that do this. Engagement may involve oversight of the internal practices of portfolio companies. For example, investors may choose to work with management during the due diligence process to get an environmental action plan into place. Post investment, investors may require the company to report on its environmental status monthly or quarterly as part of the shareholder agreement.

***The Cleantech Venture Network** brings together clean technology investors and entrepreneurs in order to facilitate the financing of clean tech companies. Members have access to several databases that provide useful information for the deal seeking investor.*

Real estate

Overview: What you can do

- Manage climate risks across existing building stock and in new development
- Target opportunities for improved building performance
- Adjust investments to support less carbon intensive built environments

I. Real estate and responsible investment

Real estate investment involves a variety of products – from private equity placements, to debt financing, to publicly traded Real Estate Investment Trusts (REITs) and securitized mortgages – all tied to ownership of existing buildings, the rehabilitation of existing buildings, and new construction. Real estate investments also involve a wide range of sub-asset classes, such as office and industrial space, multifamily rental properties, single-family residences and mixed-use development.

From the perspective of responsible investment, the real estate asset class raises a host of important questions. Real estate investments help determine how people live and work, they are intimately connected to social and public policy, and these investments are an important engine of economic activity throughout whole economies. Environmental, social and governance (ESG) analysis can help investors take into account the regulatory, political, consumer and physical contexts in which real estate investments take on value. In addition, real estate is a relatively illiquid asset class, and so favors the longer term time horizons in which ESG analysis is likely to be material.

II. Real estate and climate change

Building use makes up a substantial percentage of overall energy use, and is responsible for a similarly substantial percentage of greenhouse gases across different societies and economies – estimate typically are in the 35-45 percent range of carbon emissions from buildings. Operating costs for buildings are naturally exposed to changes in energy costs, and at risk for increased costs associated with a price attached to carbon and other greenhouse gases in the marketplace. In addition, transportation between buildings is an important factor in greenhouse gas emissions, and density and access to public transit will likely become more valuable as energy and carbon prices rise.

At the same time, real estate as an asset class is exposed to significant regulatory risks such as monitoring and regulating of energy use and greenhouse gas emissions. New regulations may target buildings in particular because efficiency improvements can be measured more easily there. Finally, the built environment is exposed in specific ways to the physical (and thus insurance) risks associated with climate change, from locations close to severe weather incidents or rising sea levels, to changing land use patterns that result from climate change.

III. How real estate investment addresses climate change

Investors frequently invest in real estate through fund managers, private equity funds, loan funds, REITs or other investment vehicles directly involved with the management of existing buildings and the rehabilitation or development of new ones. A first step for investors, then, may be to engage the fund managers of these investment vehicles on how they incorporate climate analysis into their investment practice.

In developed economies, only approximately 2 percent of buildings are built new each year, with the remaining 98 percent constituting existing stock. This creates substantial investment opportunity around improving existing building performance, from integrating energy efficient technologies into building operating systems to adopting low-cost operations strategies such as turning off the lights when empty. Investors can promote more efficient building management by working with fund managers, property managers and related parties to reduce overall energy use across a portfolio, and gather information to target the most cost-efficient mechanism for achieving this goal.

CalPERS has worked with its property managers to reduce energy use by 20 percent across its portfolio from 2006 to 2010. Similarly, TIAA-CREF has engaged its property managers to reduce energy use by 10 percent across its portfolio over a three-year period. In both cases, engagement between owners and managers has catalyzed the development of measurement and management systems that incorporate energy efficiency more directly into the property management mandate.

One of the key difficulties in incorporating energy efficiency into building operations is the complicated landlord/tenant relationship. In many cases, for example, owners are the ones who will pay for efficiency upgrades, while tenants will reap the benefits. Similarly, tenants may be responsible for energy use within their leased space, making efforts to reduce energy use by building owners more complicated. Fund managers concerned with energy efficiency are taking steps both to educate tenants on how best to operate their leased space, as well as innovative programs to share costs and benefits between owners and tenants.

***BOMA**, the Building Owners and Managers Association, has designed standardized landlord/tenant legal agreements meant to encourage energy efficiency by better aligning costs and incentives across the landlord/tenant relationship.*

*As part of its Responsible Property Investing mandate, **Kennedy Associates** has undertaken to benchmark its existing building portfolio using the Energy Star rating system, as a means to identify the most obvious targets for energy efficiency improvement. For new construction, Kennedy Associates targets **United States Green Building Council (USGBC) LEED Standards** as a third-party measure of environmental design.*

On another front, new construction and extensive rehabilitation offer investors special opportunities to address climate risks and opportunities. Recent years have seen extensive advances in green building capacity among developers and contractors, with costs for energy efficient buildings falling even as building efficiency itself is rising. Standards for building energy efficiency offer investors the means to more easily identify new construction that targets their climate-related goals.

Finally, investors may wish to review their portfolios for climate-related risks tied to location. Insurance costs for coastal properties, for instance, may change the long-term value of real estate in those areas. Buildings that are costly to operate, or that are located far from transit centers, may also create long-term risks as new regulations and higher energy prices associated with efforts to reduce carbon emissions come online.

IV. Targeting climate-related real estate investments

Investors may wish to target real estate investments that explicitly define themselves as addressing the risks and opportunities related to climate change. In some cases, these may be private equity funds that incorporate energy efficiency goals or green building standards into their charter.

*The **Hines CalPERS Green Development Fund** targets sustainable of-
fice building construction, using USGBC LEED standards as a measure
of green design. The **Jonathan Rose Smart Growth Fund** targets exist-
ing building urban infill investments with opportunities for promoting
density while increasing energy efficiency in existing buildings. **Gerding
Edlen**, a development company, ties high-performance energy efficiency
targets in new development with a Livable Places index that tracks both
building location in dense environments as well as the ability to encour-
age walking by building owners and tenants.*

Similarly, there are funds and developers that concentrate on brownfield redevelopment, smart growth, and transit-oriented development. For some funds, environmental considerations are explicit. They may, for instance, target only properties near transit stations, or within walkable communities, as a means to reduce the vehicle-miles-traveled associated with specific investments. Other funds, because of their focus on urban density, mixed-use and/or mixed-income development (including work force housing) or transit-oriented development, may offer investors a way to manage climate risk and opportunity without an explicit climate frame.

Lending institutions are exploring ways to support green rehabilitation of existing buildings, and also to target new construction that meets or exceeds performance targets from existing ratings systems.

Finally, a number of REITs are beginning to become more transparent about their energy use and greenhouse gas emissions, and are developing programs, like their private counterparts, to improve performance across portfolios. While no specifically “green” REIT has yet come to market, investors are increasingly able to evaluate REITs on their climate-related performance.

V. Real estate and stakeholder engagement

Investors can work together to promote disclosure of climate-related performance and to support clear and consistent standards that measure performance. A number of investor networks have addressed the potential for coordinated vocabulary and metrics for real estate investments across a range of social and environmental concerns. The **USGBC**, for instance, has taken the lead in multistakeholder development of systems by which to measure environmental sensitivity and performance of real estate. Similarly, the **United Nations Environment Programme Finance Initiative** has created a Property Working Group dedicated to facilitating responsible property investing best practices. The **Boston College Institute for Responsible Investment**, in partnership with the **University of Arizona**, has created the **Responsible Property Investing Center**, a network of real estate investors and developers who create triple-bottom-line investment opportunities and techniques. Finally, real estate trade associations, such as the **Urban Land Institute (ULI)** and the **International Council of Shopping Centers (ICSC)** have created programs that address key climate-related investment issues for their members.

Infrastructure

Overview: What you can do

- Target infrastructure investments that mitigate greenhouse gas emissions or support adaptation to climate change
- Assess the climate risks, physical risks and regulatory risks embedded in infrastructure investments
- Avoid funds that hold investments in infrastructure that has negative environmental impacts

I. Infrastructure and responsible investment

Private infrastructure investment is increasingly considered an asset class in and of itself, in response to demand generated by aging infrastructure in the United States and Europe, and the need for new infrastructure in emerging markets. Fixed assets such as parking lots, bridges, turnpikes, airports, power plants and water utilities are feasible options for investors. These projects provide investors with relatively predictable revenue streams with low risks. Investment in infrastructure requires long time horizons and often substantial capital, but it also offers the opportunity for stable returns.

There is an ongoing debate concerning the effectiveness of privatization of public infrastructure. This can be seen, for instance, in the intense debates over the effectiveness of the privatization of the British Rail System. Some argue that it is cheaper for the public to borrow for public investment, or that the privatization process puts too much public money into the hands of private companies. Nevertheless, an important role for private capital in infrastructure investment is likely to continue.

Infrastructure investment raises a host of environmental, social, and governance issues, from the long-term social and environmental externalities created by infrastructure development, to the role that public policy and consumer demand play in the viability of such investment. Thus infrastructure investments as an asset class may be of particular interest to responsible investors looking to address financial implications of long-term risks and opportunities. Infrastructure determines how people live, how they get energy, how they dispose of waste, and so on. It can set the framework for markets across all other asset classes.

II. Infrastructure and climate change

Climate change necessarily affects the long-term prospects of many infrastructure investments. In the first place, infrastructure related to transit or renewable power generation is likely to play a major role in political strategies to reduce greenhouse gas emissions. Similarly, investment in infrastructure may be crucial to adapt to changes in sea levels, land use patterns, or other effects of likely climate change. Climate change has significant potential to influence the long-term performance of certain infrastructure investments. Investment resources could be put toward:

- Alternative energy infrastructure that will provide the needed foundation for its increased use and availability
- New and improved power grids
- More efficient railways that allow for faster travel and less emissions.

The expected regulation of greenhouse gases at various levels creates a period of uncertainty and regulatory risk for infrastructure investments. Mandated restrictions on carbon emissions pose a risk to infrastructure investments by:

- Causing transportation companies to reduce their fleets or become more efficient in order to meet emissions reduction requirements. Fewer trucks on the roads will decrease toll revenues;
- Influencing airlines to decrease the number of scheduled flights in order to reduce their emissions, which would cause a decline in airport use;
- Reducing the competitiveness of coal-fired and other power plants that have a high level of carbon emissions.

Other infrastructure projects investors may want to assess for climate risk include parking lots, power plants and structures where physical risks include damage to assets resulting from flooding or other extreme weather events.

III. How infrastructure investment addresses climate change

Banks play an instrumental role in mobilizing financial resources for large-scale infrastructure investments. These investments often remain in operation for decades, so the financing choices of banks can have a large and lasting impact on greenhouse gas reduction targets. These banks often obtain their financing capital through issuing bonds on an open market, which provides an opportunity for individual and institutional investors to participate in the financing.

European Investment Bank (EIB) is a policy-driven nonprofit public bank that seeks to invest in specific projects that further the European Union's policy objectives. It has been integral in helping the EU revamp its infrastructure. The bank is structured in a way that it can finance long-term projects and remain self sufficient. It recently loaned 400 million euros to Poland to modernize its railway lines.

*The EIB, along with more than 60 countries and the European Council, is also a shareholder of the **European Bank for Reconstruction and Development**. This bank provides financing for sustainable infrastructure projects primarily in Eastern Europe. It recently loaned the equivalent of 15 million euros to Oufa, the capital city of the Russian Republic of Bashkortostan, to finance capital investments to improve the municipal water and wastewater infrastructure, which will contribute significantly to decreasing the level of polluting discharges into the Volga River and the Caspian Sea basin.*

Investors may also choose to seek investment in portfolios that hold companies building infrastructure that generates renewable energy and emissions credits. They may also invest in funds that collect infrastructure investments together as a unit.

***GE Energy Financial Services** invests common equity into a wide variety of water and renewable energy projects. In July 2008 it reached the \$4 billion mark in renewable energy investments. These projects include investments in wind farms, solar power and hydroelectric plants.*

There are many opportunities for investing in private equity funds that look for infrastructure investment opportunities with a climate change focus. They may seek to be investors in infrastructure projects that are contributing to alternative energy production. A climate-conscious investor may look for private equity funds that may not focus specifically on infrastructure, but that have multiple portfolio companies owning or building green infrastructures.

*The International Finance Corporation's new infrastructure fund, **InfraVentures**, is partnering with Reykjavik Energy Invest on the joint exploration and subsequent development of geothermal resources in Djibouti.*

Commodities

Overview: What you can do

- Review potential impacts on commodity prices of new climate-change-related regulations
- Assess viability of carbon markets for long-term investing strategies and measurable climate change mitigation

I. Commodities and responsible investment

Most commodities markets deal with natural resources and agricultural products. They function to reduce the risks inherent in raising or extracting these commodities and bringing them to markets. Primarily focused on speculation on future contract prices, commodities offer investors the opportunity to influence how commerce interacts with the natural environment.

With the exception of the creation of a carbon market, little thought has been given by the investment community on how to incorporate social and environmental concerns into commodity investments. However, the idea of creating commodity markets specifically to address social and environmental risks as the carbon-trading markets do is suggestive. The practicality of incorporating ESG concerns into today's commodity markets remains unclear – research and product development is likely necessary before investors can fully take into account long-term risks and opportunities in their commodity trading strategies. What is clear is that emissions regulation and carbon pricing in the United States, Europe, Australia, Japan and other markets is likely in the near future. Not only will markets be created for trading carbon commodities, it is possible that other products with sustainability implications will follow suit and commoditize as well.

II. Commodities and climate change

Through commodity investing, capital is directed toward agriculture, metals and minerals, water infrastructure and supplies, and energy sources (whether renewable or otherwise). Investment may lead to an expansion of supply, but it also raises the possibility of exploitation and mistreatment of natural resources. From a climate-related perspective, commodities can involve important differences in carbon intensity in their production, transportation and use, allowing investors to determine the long-term exposure of particular commodities markets to climate risk. One commodity in particular – carbon – has, through the development of appropriately regulated markets, the potential to become a crucial arena for climate-related investing.

A sophisticated commodities market can provide pricing stability for natural resources with characteristics that are environmentally preferable. Investing in commodity markets improves the commodity's liquidity, which assists producers in achieving greater price stability and improved performance. A climate lens may allow investors to leverage this strategy by investing in commodities that are known to be a comparable alternative to environmentally problematic choices. For example, investors may buy natural gas instead of crude oil or aluminum instead of other metals.

While the carbon market is the most prominent, there are other environmental commodity markets that are emerging. For instance, the collapse of fish and seafood species around the world initiated markets in individual fishing quotas. Financial products targeted at preserving water have also been developed, and water is seen by many to be the "next carbon," with potential valuing and trading mechanisms under discussion.

III. How commodities investment addresses climate change

Investors may wish to evaluate a commodity investment by considering the product or its production process, and eliminating or underweighting those with a negative impact, or emphasizing those that have positive impacts.

By choosing to remove commodities that have a harmful impact on the environment from their portfolio, climate-conscious investors are, in the language of responsible investment, applying a negative screen to these products. Coal, for example, has traditionally been seen as an abundant energy source associated with low electricity prices. However, with the impending carbon emissions regulations and unproven technology on carbon capturing at coal plants, the burning of coal is increasingly scrutinized for its adverse affect on the environment. Credible global emissions reduction strategies include major reductions in the reliance of coal.

However, one key point must be emphasized: the often short-term nature of commodities markets raises doubts about the efficacy of taking long-term risks and opportunities into account via commodities investing.

While technology and alternative energy efforts to identify cost-effective alternatives to burning coal for energy are advancing, the cost of power plant construction is rising and, in first-world markets, coal plant construction faces serious challenges. Investors may choose to reduce or remove their energy investments from coal entirely, and focus on more cost-efficient and renewable forms of energy in order to entirely mitigate the risk of investing in coal.

*The **Interfaith Center of Corporate Responsibility** published a study called **Don't Get Burned: The Risks of Investing in New Coal-Fired Generating Facilities**. It highlights the risks and downsides of investing in coal-fired power plants, highlighting the high costs in construction and maintaining the plants as well as its emissions' damaging effect to the environment. The study concluded that coal is losing its appeal as a predictable investment and is rather laden with uncertainty.*

Other ESG consideration can complicate a climate-related investing strategy. For instance, an increasing emphasis on the use of biofuels as an alternative to gasoline has closely linked the food commodities market with climate change initiatives. Regulations have been set across the world requiring a specified level of biofuel use in a set period of time. While these requirements could be seen as a driver to increasing the demand for food commodities and therefore a promising investment opportunity, investors should be aware of the link between biofuel use and the food crisis.

*The United Kingdom's **Renewable Fuel Agency's Gallagher Report** linked first-generation biofuels with the potential to increase greenhouse gas emissions and increase global food prices. The report called for a focus on advanced biofuels and targeting of marginal land that it not suitable for food cultivation.*

The increased production of biofuels has diverted grain away from food, encouraged farmers to set aside land for biofuel production, and sparked speculations in grains. Though there is research under way to find methods of producing “second generation” biofuel from algae or waste such as straw, the current food issues facing the world have caused governments such as the EU to revisit their commitment to biofuel use.

Investors may also seek to familiarize themselves with the sourcing locality of the commodity to conduct a risk analysis. This is challenging because the counter-party to most of the commodities’ contractual agreements is the exchange on which it is listed. This leaves the exact location of the source unknown in most cases. However, some products are traded on exchanges that are identified as being in specific regions, such as the Dubai Mercantile Exchange or the European Climate Exchange.

IV. How investors can trade carbon

As emission regulation plans are increasingly implemented, there will be a growing demand for investors in the carbon trading market. Renewable Energy Certificates (RECs) and Emissions Credits are two items that have surfaced in this market.

Renewable Energy Credits

One REC represents a unit of electricity and RECs are given out to generators who qualify as creating renewable units of electricity. Electricity providers are required to purchase sufficient number of these RECs to meet the requirements set in their jurisdiction. The market price for an REC can be seen as a subsidy paid to a renewable source per unit of production. Along with contributing to building the market for renewable energy, the purchase of RECs helps offset the carbon emissions associated with conventional energy generation.

Emissions Credits

An emissions credit represents an avoided unit of a pollutant. They are generated when an entity undertakes a project that would not have been done if they were not trying to reduce their emissions. These credits are then sold to entities who want to reduce their emissions. The credits have resulted in the evolution of emissions trading. Commodity investors can purchase these credits on the open market as a purely financial activity through speculation and arbitrage. This activity generally improves the efficiency of the commodity market and accuracy of the price.

In the European Union, an emissions credit is the right to emit a unit of carbon. The EU's cap and trade scheme requires carbon-emitting entities to hold enough credits to offset their emissions. Total emissions are controlled by allowing a limited number of these credits. If a significant number of credits were purchased and simply disposed of without exercising the right to emit, total emissions would be reduced by the number of credits purchased.

*In 2007 the **European Investment Bank** initiated a **Climate Awareness Bond**. On maturity, investors will have the purely philanthropic option to use some of their returns to buy and cancel EU carbon dioxide allowances, which reduces the available capacity for future emissions.*

There are currently a handful of voluntary yet legally binding systems where members are required to meet annual greenhouse gas emissions reduction targets. These markets aim to drive down emissions without government regulations. Those with surplus allowances may sell them to the exchanges in the form of several different derivative contracts.

*Local traders may trade on the **Chicago Climate Exchange (CCX)** for purposes other than complying with emissions reduction requirements. Individuals or entities may also purchase carbon derivative contracts from the **Chicago Climate Futures Exchange** and retire them to offset emissions.*

*The New York Mercantile Exchange established **The Green Exchange** that offers a range of environmental futures, options, and swaps contracts for markets focused on solutions to climate change and renewable energy.*

Investors looking to become involved in the carbon credit market but unable to identify viable direct investments in the commodity, may seek investment opportunities in projects or funds that generate the carbon credits. The growing demand for the credits leads to a growing demand for projects that create them.

*In October 2007 **Morgan Stanley** announced it will invest \$3 billion over the next five years in carbon credits and other initiatives. While the majority of the investment will be in carbon credits purchased from projects, the remaining investments will be in certified emissions reduction projects.*

***Carbonfund.org** supports projects where renewable energy developers sell the environmental benefit of their projects as Renewable Energy Certificates. The RECs are sold through its **MyGreenFuture** product.*

***Asian Development Bank (ADB)** has established a new fund that will use carbon credits generated beyond 2012 to finance clean energy projects in the Asia-Pacific region. ADB said the new **Future Carbon Fund**, with an initial size of us\$100 million, will provide financing up front for ADB-supported projects that provide carbon credits.*

It should be noted, however, that carbon trading remains an immature market, and the difficulties in measuring emissions and their reduction through, for instance, carbon offset programs, remain a source of concern. The public debate over structuring carbon markets will prove crucial to their success both as financial systems as well as carbon reduction platforms.

V. Commodities and stakeholder engagement

Encouraging the development and use of standards for production

There is potential for carbon pricing to enter into the standards of production across multiple industries. Investors can choose to join networks and organizations that are in existence to promote the use of carbon pricing and other ecosystem-related investments. There is a wealth of information available to investors looking to learn more about carbon trading and how to become involved in the markets.

*The **Pew Center on Global Climate Change** brings business leaders and policymakers together to discuss strategies and insights in order to seek climate change solutions. They see market mechanisms such as carbon trading as key elements of addressing climate change.*

***Ecosystem Marketplace** serves as a repository for carbon trading information. It provides transparent market information on carbon trading and alternative energy investing in order to facilitate transactions and encourage new thinking in the environmental commodities market.*

Hedge funds

Overview: What can you do?

- Identify hedge funds that use climate analysis as a trading strategy
- Encourage transparency in funds with regard to climate risk analysis
- Determine the role you think short-selling plays in climate-related investing

I. Hedge funds and responsible investment

Hedge funds are private investment vehicles that generally invest in publicly listed stocks and bonds. Usually only accessible to high net worth individuals or institutional investors, hedge funds operate in a less rigid regulatory environment than publicly available funds. This creates flexibility to invest in a variety of investment products and implement investment strategies not available to traditional public traders, but often at the cost of high management fees.

Though hedge funds do not necessarily offer particular opportunities as a responsible investment asset class – they trade in other asset classes, and their impacts are the same as those asset classes – hedge fund trading styles do raise questions around issues of transparency, or the impact of short selling, leverage and various hedging techniques such as credit default swaps that may be of particular interest to responsible investors.

II. Hedge funds and climate change

Green hedge funds have at least the potential to provide investors with substantial returns, particularly in negative market environments. Similar to other hedge fund strategies, many green hedge funds seek risk arbitrage and pursue investments in long-term value and short-term growth equities.

Hedge funds may raise specific climate-related concerns for investors. The case for climate-related investing is one of the long-term convergence of climate change impacts with prices in the market, but hedge funds may seek to capitalize on short term price fluctuations that are relatively insensitive to longer-term issues such as the correct pricing of externalities. Furthermore, green hedge funds that seek absolute returns from environmentally oriented investment strategies are relatively new entrants into the market, and so offer relatively little track record. On the opportunity side of the equation, hedge funds may be well-positioned (through, for instance, a willingness to take larger than usual positions) to play active, though behind-the-scenes, roles in affecting the behavior of corporations and other institutions.

III. How hedge fund investments may address climate change

Hedge funds often have the financial resources to make capital intensive investments, which are usually required when infrastructure is built as a part of alternative energy projects. Green hedge funds can range in strategies from screen for equities that only invest in “green businesses” to carbon, renewable energy credit, biofuels and emissions trading. Opportunities also exist to integrate climate considerations into selection of the fund’s underlying assets in the same way the long approach is taken or investment is made in other asset classes.

Shorting securities is a common strategy for hedge funds. Holding a short position in a company is a way for investors to profit from insight on materiality of climate risks. In order for this to work, the performance of stocks and the climate risk areas and issues identified by the investor must be connected. If investing in shorts, an investor may want to determine what approach to take. For instance, will you only short companies that have negative impact on the environment or will you create an initial screen for potential investments and then short from that pool based only on valuation?

When a security is in the short position, it is not actually owned by the investor and therefore renders the investor unable to engage in any shareholder activism. Because of this, investors must consider the importance of engagement with companies to their approach. For instance, if a shareholder has a short position in a company with negative environmental impacts, the shareholder holds no ownership power to press the company to change its behavior.

Investing in a fund of hedge funds is also a viable option. The fund may choose multiple asset management companies that are experts in, and dedicated to, a specific market sector. For instance, a fund of hedge funds may select experts in industries such wind, solar and hydro power while choosing to stay out of industries seen to be less profitable. Fees for funds of hedge funds should receive close scrutiny from investors.

GAM Multi-Environmental Fund is a fund of hedge funds investing in funds focusing on environmental investment themes such as clean-tech, water, commodities and other natural resources.

IV. How can investors evaluate the hedge fund managers' environmental strategies?

The private structure of the funds subjects them to less intensive disclosure requirements than other investment vehicles. Investors may want to assess the transparency of investment decisions and share selecting strategies at the hedge fund.

*GLG Partners Environment Fund is a long-only hedge fund that filters the greenest companies from its European Equity strategy. The fund uses the research company **Trucost** to provide data for its "green filter" that is used for stock selection.*

Appendix: Links to organizations and referenced readings

Cash

Examples of climate-related cash investments

Wainwright Bank Green Loans www.wainwrightbank.com/html/personal/loans/green.html

ShoreBank Pacific emission offsetting credit card www.redirectguide.com/visa/

New Resource Bank www.newresourcebank.com

Triodos Renewables www.triodos.co.uk/uk/235298/235332/423845/

Royal Bank of Canada www.royalbank.com

Bank of America www.bankofamerica.com

Barclays Capital www.barcap.com

HSBC www.hsbc.com

Groupe Caisse D'Epargne Social Labeling http://www.groupe.caisse-epargne.com/cpp/101/aul/blob/pdf_diap_080618_etiquetage_ci_080623163207.pdf

PNC Bank www.pnc.com

Goldman Sachs Environmental Policy <http://www2.goldmansachs.com/citizenship/environment/index.html>

TIAA-CREF www.tiaa-cref.org

Research and advocacy organizations

Equator Principles www.equator-principles.com/index.shtml

Les Amis de la Terre www.amisdelaterre.org

World Wildlife Federation (WWF) www.wwf.org

Ademe www.ademe.fr

The Climate Group www.theclimategroup.org

KLD Research www.kld.com/research/index.html

Innovest Strategic Value Investors www.innovestgroup.com

Ceres www.ceres.org

Fixed income

Examples of climate-related fixed income investments

GreenStar USA www.greenstarusa.com

Climate Awareness Bond www.eibclimatebond.eu

European Bank for Reconstruction and Development www.ebrd.com

Berkeley First www.berkeleyfirst.renewfund.com

Community Capital Management www.ccmfixedincome.com

World Bank www.worldbank.org

Citigroup's Environmental policy www.citigroup.com/citi/environment

Public equity

Examples of climate-related public equity investments

NASDAQ® Clean Edge® U.S. Liquid Series Index www.cleandedge.com/CEindex.php

Pictet Clean Energy Fund <http://www.pictet.com/en/home.html>

Calvert Global Alternative Energy Fund www.calvert.com/alternativeenergy/globalalternativeenergyfund.html

Pax World Global Green Fund www.paxworld.com/funds/pax-world-global-green-fund

KBC Asset Management www.kbcam.be

Allianz RCM Global EcoTrends Fund www.allianzinvestors.com/mutualFunds/profile/RCGET/performance_A.jsp

Winslow Green Growth Fund www.winslowgreen.com/home/

Neuberger Berman Climate Change Fund www.nb.com

Trillium Asset Management www.trilliuminvest.com

Green Century Capital Management www.greencentury.com/home/default.aspx

Research and advocacy organizations

KLD Global Climate 100 Index www.kld.com/indexes/gc100/index.html

Trucost www.trucost.com

McKinsey & Company www.mckinsey.com/clientservice/ccsi

J.P. Morgan www.jpmorgan.com/pages/jpmorgan/investbk/solutions/research/climatechange

Deutsche Bank www.dbresearch.com

Innovest Carbon Beta Risk Assessment Platform
www.innovestgroup.com/japan/carbon_beta_risk_analytics_platformv2.pdf

EIRIS www.eiris.org

KLD Socrates www.kld.com/research/socrates/index.html

Carbon Disclosure Project www.cdproject.net

ProxyDemocracy.org

Investor Network on Climate Risk (INCR) www.incr.com/

Interfaith Center on Corporate Responsibility www.iccr.org

United Nations Environmental Program Finance Initiative www.unepfi.org
www.unep.org/Documents.Multilingual/Default.asp?DocumentID=548&ArticleID=5957&l=en

Private equity

Examples of climate-related private equity investments

Massachusetts Green Energy Fund www.massgreenenergy.com/index.html

Good Energies www.goodenergies.com

US Renewables Group, LLC www.usregroup.com

Khosla Ventures www.khoslaventures.com

Kleiner, Perkins, Caufield & Byers www.kpcb.com

Pacific Gas and Electric www.pge.com

KKR www.kkr.com

Texas Pacific Group www.texaspacificgroup.com

Research and advocacy organizations

Environmental Defense Fund www.edf.org

Natural Resources Defense Council www.nrdc.org

Cleantech Venture Network www.cleantech.com

Real estate**Examples of climate-related real estate investments**

CalPERS www.calpers.ca.gov

TIAA-CREF www.tiaa-cref.org

Kennedy Associates www.kennedyusa.com

Hines www.hines.com

Jonathan Rose www.rose-network.com

Gerding Edlen www.gerdingedlen.com

Research and advocacy organizations

BOMA www.boma.org

Energy Star www.energystar.gov

United States Green Building Council www.usgbc.org

United Nations Environment Programme Finance Initiative www.unepfi.org

Responsible Property Investing Center www.responsibleproperty.net

Urban Land Institute www.uli.org

International Council of Shopping Centers www.icsc.org

Infrastructure

European Investment Bank www.eib.org

European Bank for Reconstruction and Development www.ebrd.com

Equator Principles www.equator-principles.com/index.shtml

GE Energy Financial Services www.geenergyfinancialservices.com

IFC InfraVentures Fund www.ifc.org

Commodities

Examples of climate-related commodities investments

Climate Awareness Bond www.eibclimatebond.eu

Chicago Climate Exchange www.chicagoclimatex.com

The Green Exchange <http://nymex.greenfutures.com/>

Morgan Stanley www.morganstanley.com/globalcitizen/index.html

Carbon Fund www.carbonfund.org

Asia Development Bank www.adb.org/clean-energy/cmi.asp

Gallagher Report www.biofuelsdigest.com/blog2/2008/07/09/uks-gallagher-report-calls-for-lowered-biofuel-targets-euro-parliament-votes-to-drop-2015-target-to-4-percent/

Research and advocacy organizations

ICCR-Don't Get Burned www.iccr.org/news/press_releases/pdf%20files/Dont-GetBurned08.pdf

Pew Center on Global Climate Change www.pewclimate.org

Ecosystem Marketplace www.ecosystemmarketplace.com

Hedge funds

Examples of climate-related hedge fund investments

GAM Multi-Environmental www.gam.com

GLG Partners Environment Fund www.glgpartners.com

Trucost www.trucost.org

Boston College Center for Corporate Citizenship

The Boston College Center for Corporate Citizenship is a membership-based research organization associated with the Carroll School of Management. It is committed to helping business leverage its social, economic and human assets to ensure both its success and a more just and sustainable world. As a leading resource on corporate citizenship, the Center works with global corporations to help them define, plan, and operationalize their corporate citizenship. Through the power of research, management programs and the insights of its 350 corporate members, the Center creates knowledge, value and demand for corporate citizenship. www.BCCorporateCitizenship.org

Institute for Responsible Investment

The Institute for Responsible Investment, a project of the Boston College Center for Corporate Citizenship, provides a platform for dialogue on fundamental issues and theories underlying responsible investing. Our work is meant to identify and promote market structures and investment activity that can best create long-term wealth creation for investors and society alike.



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**Learning, Practice, Results.
In Good Company.**

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