The Greening of Finance: A Brief Overview

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ABSTRACT

This paper provides a brief overview of some of the sustainability developments that companies and non-profit groups have undertaken in the finance area including sustainability in banking, venture capital and investment companies, and integration of sustainability as part of corporate social responsibility by large and small companies. Although in practice by many corporations have taken on a more social and environmental focus in terms of sustainable finance and accounting efforts, the field of finance generally neglects sustainability considerations. Given the dramatic changes and the importance of climate change for corporations, financial theory and pedagogy needs to include sustainability considerations.

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1. Introduction

In a recent article Morales (2013) points out that for the first time in 3 million years, the amount of atmospheric carbon dioxide has now exceeded 400 parts per million, a record since 1958 when data was first tracked by the U.S. National Oceanic and Atmospheric Administration (NOAA). Morales notes that many scientists consider this level to be a watershed event where unless man-made carbon emissions created by burning fossil fuels there will be future weather pattern changes, lower Artic ice cover and higher sea levels. Regulatory changes are likely to occur in the future placing limits on company emissions
that will affect the way many companies do business, particularly companies that have large carbon emissions.

Many large companies are aware of a global sustainability challenges and have joined the Global Reporting Initiative (GRI) and the United Nations Principles for Responsible Investment and have made efforts to report carbon emissions. Large companies have also issued sustainability reports have or are in the process of setting goals to reduce carbon emissions and embrace sustainability as a key value. In the Accounting Area, there have also been major inroads to include Sustainability including the establishment of the Sustainability Accounting Standards Board (SASB) as a non-profit that provides standards for publicly-listed corporation in the U.S. to disclose sustainability issues that are material to the benefit of investors and the public. The SASB standards by design assist companies in their mandatory filings to the Security Exchange Commission including Form 10-K and 20-F for improved performance on high priority environmental, social, and governance issues (www.sasb.org). SASB includes Industry Working Groups in the finance area including financials for Commercial Banks, Investment Banking & Brokerage firms, Investment Banking and Brokerage, Asset Management & Custody Activities, Consumer Finance, Mortgage Finance, Insurance, and Security and Commodity Exchanges. SASB has the vision of a world where all forms of capital are accounted for and managed including sustainability issues and environmental, social and governance factors, recognizing that these have the potential for affecting long-term value creation and that they are in the public’s interest.

Yet, Business Schools have been slow to embrace sustainability as an important part of undergraduate and MBA curriculums. Most efforts in Sustainability have been associated with schools joining as a signatory for the UN’s Principles for Responsible Management Education (PRME) where schools sign on to the mission to “inspire and champion responsible management education, research and thought leadership globally” (see PRME Principles for Responsible Management Education, www.unprme.org) which includes the adoption of six guiding principles in an attempt to integrate corporate responsibility in a gradual but “systemic manner” in to the Business School curriculum and research. As of July 2013, 505 school signatories were communicating participants worldwide. Schools share information and achievements in curriculum integration and research in the field of corporate responsibility and sustainability, as a movement in the direction of including environmental and social considerations in higher education endeavors.

As Matthews (2013, p. 13) points out: “The greening of capitalism is the biggest change to the world of business since the second industrial revolution, and it is time for business schools to catch up.”

Matthews notes one area that business schools fail to address the great challenge of entrepreneurial opportunities opening up with inadequate public funding for innovative new technology including new green energy systems if solutions to climate change are to be developed that depend on private finance for their development. With as of 2010 SEC mandates that publicly traded firms must disclose information how climate change will affect operations, publicly-traded companies have taken seriously climate change and its potential future effects.
Business Schools rarely include sustainability as a required part of the curriculum, whether to be included as a topic in required courses or as a separate course. Finance as a discipline in particular has generally neglected environmental, social, and corporate governance factors as an important part of decision-making. Also, finance theory retains its focus on shareholder wealth maximization and market efficiency, despite dramatic environmental and social changes that have occurred including climate change, as well as other societal changes, and changes in public sentiment following the sub-prime loan crisis of 2007 to 2008.

This paper provides a brief overview of just a few of the efforts that companies have made in terms of some sustainable finance or what is often referred to as the *greening of finance*, pointing out the large gap that exists that needs to be resolved in finance theory and education to including sustainability as an integrated part of the discipline. Section 2 provides an overview of sustainable banking, while section 3 discusses socially responsible investing firms and social investor activism. Section 4 public/private partnerships for energy efficiency projects, and Section 5 offers a brief overview of other important aspects of sustainable finance, followed by a conclusion.

2. Sustainable Banking

Banks in their credit analysis and lending activities have been subject to environmental liability issues, so sustainability issues from a lending perspective have been an important risk-management issue, and banks have realized great cost inefficiencies in terms of high energy costs and paper use that can be solved with sustainable management practices that focus on energy reduction and the use of recycled paper or encouraging online banking. Banks have also realized benefits of stakeholder engagement with the development of new products that are eco-friendly and making customers stakeholders with green or socially beneficial products and strategies.

Jeucken (2002) notes that as early as 1990 large European and British Banks engaged in energy reduction projects that are beneficial to the environment. Banks have particular sustainability issues in terms of having an enormous paper trail for financial transactions and large energy needs for information systems and back-off operations, and energy for buildings. Stakeholders have also put pressure on banks to curtail lending to companies that is detrimental to the environment or has negative social implications.

National Westminster Bank over 1991 to 1995 reduced its energy costs by $50 million, and UBS over 1990 to 1993 its energy costs by 25 percent. A unique bank that uses solar power and other types of renewable energy for its buildings, Tridos Bank, established in the 1980s in the Netherlands has the purpose of investing in projects that benefitted both people and the environment. Tridos Bank was awarded the Sustainable Bank of the Year.

In 2009 for the Sustainable Finance Awards given annually by the *Financial Times*, which also includes Sustainable Investor of the year, Sustainable Investment of the Year,

Bouma, Klinkers, and Jeucken (2002, Chapter 1) point out that potential energy savings of banks are huge, with some banks currently using renewable energy, such as solar energy. Internally by reducing energy use substantial cost savings have been gained. From a product standpoint, banks have also engaged customers as stakeholders by creating socially and environmentally favorable products, for example credit cards that are biodegradable or that provide paybacks that go to clean energy or other socially desirable projects. External stakeholders pushing for integrating sustainability in day to day operations and corporate policies, Jeucken and Bouma note include employees, shareholders, board of directors, as well as customers, governments, competitors, non-governmental organizations, and the public as a whole.

In the U.S. Bank of America took a lead in sustainable management by adopting a set of environmental principles in 1991 that included environmental practices for not just the bank, but also for its vendors and contractors. This included initiatives for greater use of recycled paper that including co-founding the Recycled Paper Coalition to provide a larger market and access for recycled paper. As of 1999, Bank of America used environmental principles in determining its paper vendor purchasing contracts. In 2007 Bank of America made a 10-year, $20 billion dollar commitment to promote sustainability in its lending policies including financing companies engaging in alternative energy technologies and products and services, becoming part of the solutions versus being part of social and environmental problems. In 2008 Bank of America also invested in a new energy management system for 3,300 banking centers to reduce both its energy costs and greenhouse gas emissions. Internally, Bank of America has also encouraged its employees and customers to be more sustainable with cash incentives to employees to purchase hybrid vehicles and lower loan rates for customers purchasing energy-efficient homes and encouragement for online banking. Customers can also set up credit/debit cards, with a percentage of purchases assisting companies that were developing renewable energy projects. Other large banks, credit Unions and regional and community banks have also engaged in sustainability initiatives that not only reduce their impact on the environment, but enable considerable savings in terms of energy savings and provide environmental educations and savings for their customers (see Cooperman, 2011, 118-136). This including energy savings by renovating buildings to make them more efficient and setting up LEED-certified building and branches by JPMorgan Chase, Chittenden Bank, Northwest Georgia Bank, Wells Fargo and many other banks, with substantial energy savings.

On the lending side, 79 large international banks and one associate in 35 countries as of 2013 have officially signed on to the Equator Principles including in the U.S., JPMorgan Chase, Citigroup, Bank of America, Ex-IM Bank and Wells Fargo Bank, as well as other large banks around the world. This covers 70 percent of international
project debt in emerging markets. The Equator Principles, banks agree to guidelines on social and environmental issues in loans to developing countries including making environmental assessments for major loans. The Equator Principles originally set up in 2002 with 10 global banks. Today the Equator Principles as of 2006 includes all project loans of $10 million or more across different industry sectors, and a credit risk management framework is used for determining, assessing, and managing environmental and social risk for project finance transactions (see www.equator-principles.com and Epstein, 2008). The Equator Principles are applied globally to all industry sections and to four financial products including Project Finance Advisory Services, Project Finance, Project-Related Corporate Loans, and Bridge Loans. Financial Institutions that are Equator Principle members commit to the implementation of the Equator Principles in their internal environmental and social policies, procedures and standards for the financing of projects and are committed to not providing loans to projects with clients that will not or are unable to comply with the Equator Principles.

As a platform for engaging interested stakeholders, the Equator Principles have also helped to “spur” the development of other environmentally and socially responsible practices in the finance sector and banking industry including the Carbon Principles in the U.S. (see www.carbonprinciples.org) and the Climate Principles Worldwide (see www.theclimategroup.org). The Carbon Principles provide a methodology for banks and their U.S. power clients to evaluate and address carbon risks in financing electric power projects. The Climate Group is a non-profit organization providing leadership for a “low carbon future” including launching a “clean revolution” campaign, including the development of a “massive scale-up of clean technology, green infrastructure, smart design and resource efficiency” to deliver “economic growth and quality jobs” (see www.thecleanrevolution.org).

Large financial institutions have also funded clean energy projects. As noted in Cooperman (2011, p. 123), for instance, Barclays has done multi-million dollar project funding involving wind farms; Wells Fargo had loans of greater than $1.7 billion for LEED projects including construction loans and some permanent financing. Alternative new community-focused banks that often provide environmentally focused loans that other bank may not finance include New Resource Bank in San Francisco, First Green Bank of Florida, Green Bank in Houston, Common Good Bank in western Massachusetts, e3bank in Philadelphia, and One Earth Bank in Austin, Texas. As pointed out in Hudgins (2008) some challenges remain for Green Building financing in terms of appraisers and underwriters that are unfamiliar with the value created with green buildings including valuing future energy saves and revenues produced over the life of a project.

Even small and medium-sized banks have achieved significant savings by being sustainably managed. Alpine Bank, an independent community bank on the Western Slope in Colorado obtained an ISO 14001 certification for its environmental management including its use of clean energy, water conservation, and recycling, and use of recycled paper products and green cleaners. Credit unions have engaged in sustainability efforts as well. Boulder Valley Credit Union (BVCU) in Boulder, Colorado, is a pioneer for eco-friendly credit unions. BVCU started out by purchasing a 10-kilowatt Sun Power solar electric system produces emission-free clean solar electricity. Making this event into a
celebration, BVCU rewarded customers for engaging in positive ways to lower their carbon footprint including low-rate financing for home solar electric systems and lower auto loan rates for fuel-efficient cars. BVCU developed strategies to change its employee culture to include recycling, composting, use of recyclable products and conservations of energy and materials across its branches. BVCU also developed partnerships across other businesses, including Eco-Cycle and other environmentally conscious businesses and non-profit environmental groups and an educational website.

Other Credit Unions that have engaged in sustainability include Permaculture Credit Union in New Mexico, Arizona State Credit Union, and Bellco Credit Union in Colorado. Efforts have been made by banks to offer incentives for customer online banking and online bill-paying reducing paper waste. Loan discounts for energy saving automobiles, and loans for home solar energy systems, and often have websites with energy savings tips and environmental education for customers. Permaculture Credit Union adopted an ethical code where no loans would be given to businesses that are exploitative and funds are invested in sustainable projects and the community. Arizona State Credit Unions offers loans to community-focused firms engaging in sustainable project including the financing for Flagstaff’s first solar-powered multi-housing development in 2009. Bellco Credit Union developed a partnership with PayITGREENTM (www.payitgreen.org) to plant trees in the honor of customers as a reward for customers using online banking and e-statements (Cooperman, 2011).

Most large banks publish Sustainability Reports on their websites and many are part of the Global Reporting Initiative (GRI), Carbon Disclosure Project for reports on sustainability and carbon emissions. The United Nations Environment Programs (UNEP) publishes a UNEP FI Guide to Banking and Sustainability (see UNEP FI Guide, 2011) that provides information for banks to understand and implement sustainability in their operations, pointing out how sustainable development is a sound business practice and that banks play an important role of the finance sector in achieving sustainable development. The section on Sustainability Management points out different aspects including compliance and integration, risk management, environmental management, ongoing learning and implementation, monitoring progress against goals, and products and services. Illustrations include current practices of UNEP FI Member banks from global banks including: (1) Global Banks, (2) Development Banks, (3) Regional Banks; and (4) Local Banks. Public awareness and communication are of key importance to engage stakeholders including a recommendation that financial institutions develop and publish statements of sustainability policy with periodic reports on how they integrate environmental and social considerations in their operations.

An example for Environmental Commitments and Sustainability reports is Citicorp’s Global Citizenship: A Commitment to the Environment posted on Citicorp’s website at http://www.citigroup.com/citi/environment/ where its commitment (with details in its Global Citizenship Report) is quoted on page 1 for this section as follows:

*Integrating environmental sustainability into our core business generates value for our clients, customers, communities and our firm. That is why we have a growing*
portfolio of green buildings, implement a comprehensive set of environmental and social risk policies and play a leading role identifying and financing new environment-based opportunities such as clean energy. Our Environmental Sustainability approach is based on our commitment to our core principles: Common Purpose, Responsible Finance, Ingenuity and Leadership.

This commitment is followed with a strategy to reduce Citicorp’s environmental footprint, “manage environmental and social risks in transactions, and finance environmental opportunities,” with policies and standards companywide to be a “leader in environmental sustainability,” and with a performance report card posted that include details on reduction in GHG emissions, LEED projects by building type, transactions receiving Environmental and Social Risk Management (ESRM) review in 2012, the Equator Principles-covered Project Finance Loans, Opportunities (including clean energy financing and investment), Citicorp’s $50 billion climate initiative technology mix (including 49% solar, 12% wind, 19% energy efficiency, 0.5% Biomass, 0.4% carbon/renewable energy certificates (RECs) and about 19% other, as well as products meet customer needs and that reduce Citicorp’s carbon footprint, such as credit card e-statements. Citicorp’s Global Citizenship Report 2012 notes achievements in energy emissions reductions by 8.8% and carbon emission by 21.7% from a 2005 baseline year, and directing $8.02 billion towards its $50 billion climate initiative in 2012, completing a total of $44.37 billion, and on page 40 of the report provides detailed performance measures for its environmental footprint including green house gas emissions and energy use (http://www.citigroup.com/citi/environment/performance.htm and http://www.citigroup.com/citi/about/data/corp_citizenship/global_2012_english.pdf).

Many other large banks worldwide are engaging in environmental and social initiatives worldwide. Deutsche Bank in its Corporate Responsibility Report notes a commitment to encourage sustainable community development and to address the changing needs of the underserved. Deutsche Bank set a target in 2008 of maintaining carbon neutrality by the end of 2012 to 2010 on a climate-neutral basis. Deutsche Bank has been improving the company’s energy efficiency by reducing energy, water, and paper consumption and utilizing renewable industry, improving waste management, and developing a sustainable supply chain. In 2013 this target was achieved by reducing the bank’s global carbon footprint by 20 percent a year after 2008. This achievement put Deutsche Bank as a leader in the Carbon Disclosure Leadership index in 2012, among 33 companies worldwide (http://www.db.com/cr/en/environment/index.htm).

3. Socially Responsible Investment Firms

Socially Responsible Investments (SRI) have become mainstream. With Sustainability Indexes including the Dow Jones Sustainability Indexes (DJSI), the FTSE4Good Index series, the Goldman Sachs GS SUSTAIN ESG (environmental, social and governance) index, the Domini 400 Social Index, MSCI World, the KLD Broad Market Social Index (BMSI) among many others. Many mutual funds offer customers the ability to invest in different types of socially and environmentally responsible indexes as socially responsible investments. SRI investment funds have also grown.
Fung, Law, and Yau, (2010) note major categories of SRI portfolios including environmental, religious or ethical, social and corporate governance, with portfolios often including a combination of these. They also point out different strategies used for constructing SRI vehicles that include focusing on the ESG factors, but also on long-term risks associated with these factors, as well as conventional considerations of risk, return, and time horizon, and five strategies generally used to create SRI portfolios. These strategies include: (1) Investment screens (both positive and negative types of screening), a best-in-class approach, with a comparison and ranking of firms in a specific Selected group, such as an industry sector or benchmark index, (3) engagement by working with a company being considered in which a “critical” amount of capital is being invested, as often used for private equity investors and bank lenders; (4) shareholder advocacy and activism to support specific causes; and (5) an integrated approach that may involve a combination of these strategies and/or using investing criteria that includes additional ESG metrics for creating portfolios.

Social Funds (www.socialfunds.com) lists numerous mutual funds that offer social or environmental funds or social index funds including Calvert, Green Century, Domini, Dreyfus, Legg Mason, TIAA-CREF, PIMCO, Pax World, Parnassus, Parnassus, New Covenant, Neuberger, Vanguard, Utopia, among many others. Some SRI founds are more regional, such as First Affirmative Financial Network, LLC, a professional investment management firm in Colorado that allows individually-tailored portfolios to be created for individual investor customers.

Some SRI mutual funds have been set up as well to be advocates for environmental health issues, as social activists as well using management funds (versus funds being managed) to purchase the minimum share holding requirement to meet SEC proxy resolution filing requirements. Social activists include a mixture of SRI mutual funds, private equity investors, state and city and union pension funds, private foundations, and social-environmental non-profit groups. Non-profit groups such as the As You Sow Foundation and CERES assist in these types of resolutions, and often a group of these types of investors to group together to submit a joint environmental-health shareholder resolution. Many proposals have been successful by engaging companies particularly in cases of harmful chemicals and products to have a proposal withdrawn and negotiated based on future company actions (see Byrd and Cooperman, 2012; 2013; Lee and Lounsbury, 2011).

According to the Forum for Sustainable and Responsible Investment (www.ussif.org/trends and www.tiaa-cref.org/public/pdf/ussiftrends2012pdf) in the 2012 Report on Sustainable and Responsible Investing Trends in the U.S. responsible investments in the U.S. was $3.74 trillion at the end of 2011, representing a 22% rise from year-end 2009. Assets engaged in sustainable and responsible investing practices are 11.3 percent of about $33.3 trillion in total assets under management that are tracked by Thomson Reuters Nelson. The use of strategies for investment incorporating environmental, social, and corporate governance (ESG) criteria and shareholder engagement included 443 institutional investors, 272 money managers, and 1,043 community investment institutions with over $3.3 trillion in assets and another 200
institutional investors or money managers with assets of $1.54 trillion, that filed or were co-filers of shareholder resolutions on ESG issues.

There was also a 78 percent increase in assets under management over those tracked in 2010, with $1.01 trillion in assets under management for 720 funds incorporating ESG criteria in their investment strategies (Kropp, 2012). Based on the US SIF Foundation’s tracking of the SRI market from 1995 to 2012, the universe of SRI rose by 486 percent. A segment that showed particular growth included private equity and venture capital funds, responsible property funds and hedge funds, as alternative investment vehicles, with 301 vehicles with $132 billion in assets under management incorporating ESG criteria, a rise of about 250 percent from $37.8 billion in 2010. Money managers involved in filing shareholder resolutions also increased with 82 resolutions by managers with $4.9 trillion in assets under management reporting discussion with companies that were in their portfolios, a rise from the 54 resolutions submitted by year-end 2009 (Hinchcliff, 2012; Goossens, 2012; Kropp, 2013).

Specialized and conventional Venture Capital Firms are also heavily involved in ESG investing, particularly in the Cleantech sector. In 2012 Global Clean Technology Venture Investment totaled $6.46 billion. This was as measured by dollars a 33 percent decline in total investment, and a 15% decline in deal count recorded as of January 2013 from 829 deals tracked in 2011 to 704 deals, with 60 percent of deals Series B or later rounds. The largest transactions in the top three sectors included biofuels and biochemicals with 53 deals, followed by transportation with 71 deals, and energy efficiency with 140 deals. Top Global VC investors in terms of being the most active Cleantech venture investors including Kleiner Perkins Caufield & Byers, Draper Fisher Jurvetson, Khosla Ventures, Chrysalix Energy Venture Capital, New Enterprises Associates, Braemar Energy Ventures, and Emerald Technology Ventures. As VC investment shrunk, a larger number of corporate investors have stepped in to fill the gap, with $2.7 billion in corporate partnerships, with some corporations investing in traditional venture capital funds, and others using their own venture companies (Global Clean Technology Venture Investment, 2013; Hull, 2013).

The Green Job Bank provides a partial list of leading Venture Capital Khosla Ventures (a VC firm founded by Vinod Khosla, a co-founder of Sun Microsystems), Kleiner-Perkins Caufield & Byers (a well-known venture capital firm), Draper-Fisher-Jurvetson (a fund backing extraordinary entrepreneurs everywhere that set out to change the world), Vantagepoint Capital Partners (with a strategy to provide cutting-edge technology with the resources to commercialize big opportunities), Foundation Capital (a VC firm that supports new ventures), and Rockport Capital, a leading VC firm that works with cleantech entrepreneurs to “build innovative companies that bring disruptive technologies and products to the 21st century,” among many others (http://www.thegreenjobbank.com/green-vc/green-venture-capital-firms). Many of these VC firms need experts in both new types of technology and sustainability as well as financial knowledge.
Private equity firms like KKR have also entered into sustainability in terms of responsible investment efforts. KKR in 2008 established a Green Portfolio program, noting on its website that better environmental performance is “often associated with good business performance.” As stated by Henry R. Kravis, Co-Founder of KKR:

“The business case for environmental management has never been stronger. The Green Portfolio Program highlights that environmental performance and business performance can go hand-in-hand.” (green.kkr.com/why-go-green):

KKR’s environmental strategy for its portfolio company partners is to build value by increasing efficiency, reducing operating expenses, and boosting the bottom line for portfolio company partners. As a commitment to being a responsible investor, KKR is a signatory to the United Nations Principles for Responsible Investment (UN PRI) and the Private Equity Council’s Guidelines for Responsible Investment, and plans to expand its commitment by joining CSR Europe, a European business network for corporate social responsibility that includes 75 multinational corporations and 27 national partner organizations members (KKR Green Portfolio, 2013).

KKR’s environmental strategy includes reducing greenhouse gas emissions which lowers fuel and energy costs; investing in renewable energy which helps manage energy price fluctuations, reducing water use which lowers water costs, reducing the use of raw materials which lowers input costs, reducing solid waste that lowers waste disposal costs, increasing recycling which lowers waste disposal costs and creates new revenue streams, and developing new environmentally friendly products and services which improves supplier and customer relationships (Total enrollments for participating Green Portfolio companies included 24 companies as of December 2012. In 2011, 16 portfolio companies avoided more than one million GHG emissions and 13.2 million cubic meters of water use and saved more than $644 million as a financial impact (see KKR Green Portfolio, 2013, www.green.kkr.com/why-go-green).

A recent report by UBS Research Focus (2013) is on Sustainable Investing and its competitive investment results, pointing out the importance of incorporating sustainability considerations into investment decisions, noting that while sustainability used to be considered external to the investment process, it is now “increasingly seen as central.” Alexander Friedman, the Global Chief Investment Officer for Wealth Management at UBS and Kurt E. Reiman point out a large shift that is demanded with the global economy facing climate change threats, water scarcity, and the depletion of natural resources that are important, along with human-induced factors that are accelerating with population growth. They observe that a growing number of corporations are leading the way and working with nongovernmental organizations and other stakeholders to improve this situation and also gaining sources of competitive advantage. (UBS Research Forum, p. 1). The report shows the history of sustainable investment over time and discusses: (1) the integration of environmental, social, and government (ESG) factors in traditional financial analysis and investment decisions; (2) impact investing where investments are
made into companies, organizations, and funds with the intention of generating social and environmental impacts alongside financial return; (3) sustainable theme investing in themes or assets linked to the development of sustainability with thematic funds focusing on specific or multiple ESG issues; (4) engagement and voting engaging companies on ESG matters with a long-term process to have an effect on behavior or increase disclosure, and (5) best in class with a diversified active portfolio strategy choosing the best performing investments within a universe or category or class based on ESG criteria.

The report also provides evidence of sustainable investing offering competitive returns over time including trends in the MSCI KLD 400 Social index versus the MSCI US Index from 1990 to the present, and the outperformance of selected “sustainability” funds versus broad equity market indexes, 2010 to 2013 (UBS Research Focus, 2013).


The Global Trends in Renewable Energy Investment 2013 report, that is a United Nations Environment Program backed research study that tracks the finance for green energy across the world from 2004 on found a drop in global investments in renewable energy in 2012, a decline of 12 percent as the result of a large drop in lower solar prices with a significant fall in the cost of solar photovoltaic technology and weakness in U.S. and EU markets. The report notes that the primary reason for investment slowing down was an unstable policy regime for renewable markets in developed economies. China was the dominant country for investment in renewable energy, with commitments rising 22 percent to $67 billion with a rise in solar investment, but sharp decreases occurred in emerging economies including South Africa, Morocco, Mexico, Chile and Kenya (http://www.cnn.com/2012/06/12/world/renewables-finance-unep). Macquire (2012) in an interview with experts in the field on who’s funding the green energy revolution for CNN, notes that in 2011, 44 percent of all new energy generation capacity added that year was for renewables. More finance was expected when there are lower technological risks.

Financing renewable energy projects can be complex since the cost over the life of the facility of energy produced by a renewable energy facility is generally higher than that produced by a conventional generating facility, so projects need policy supports to subsidize part of development costs to attract private investors. Tax credits have generally been allocated to a project based on its building cost versus how much energy it will produce. Hence, as noted in the USPREF Renewable Energy Finance Fundamentals (2012) potential sources of financing are: (1) Tax Credits (tax equity/lease equity; Treasury cash grant) which attracts private investors; (2) Debt financing (construction debt and term loan (with project supplied by a bank or syndicate group of banks that lend against the expected cash flows of a project, Department of Energy (DOE) loan, Municipal Debt if applicable); and (3) Equity (project equity supplied by project sponsors, that includes private equity firms or developer funds (“sometimes called cash equity”); and structured equity. Tax benefits in the U.S. include production tax credits, investment
tax credits, and accelerated depreciation under the Modified Accelerated Cost Recovery System (MACRS) that create a tax shelter for the owners of renewable energy property. Most renewable energy assets have a 5-year depreciable life, which provides tax advantages.

For project debt, larger projects can also issue bonds to institutional investors as an alternative to a bank loan. Bank loan terms vary by the term of the loan, if the loan is government is guaranteed, the certainty of future cash flows from a project and bank borrowing rates. Until recent times, debt financing was rarely used for renewable energy projects, since the cost of debt capital was insufficient to offset the higher return that tax equity investors required for the increased risk resulting from higher financial leverage. As an alternative, project sponsors often borrowed against their earnings from projects at a corporate level. However, with a reduced need for tax equity with a Treasury grant in lieu of PTC (production tax credit) and ITC (investment tax credits) and a DOE loan guarantee program, many sponsors began seeking project-level debt for renewable energy projects (see USPREF Renewable Energy Finance Fundamentals, 2012, pages 1 to 3 which provides an excellent tutorial on renewable energy finance sources of project capital, which this section relies heavily on).

Public/Private partnerships have also helped provide renewal energy for government buildings. Under such a partnership, such as a energy company provides guarantees of future energy savings as a guaranteed for a bank loan that provides funds based on cash flows generated by future energy savings.

An example is the upgrading of the Colorado State Capital Building to geothermal energy in July 2013. The upgrading allowed geothermal energy for the air conditioning system and also a replacement of existing pumps and equipment. This upgrade was the second state capital in the nation to do so, and Chevron Energy Solutions performed the upgrade and acted as a private guarantor of future savings for the bank loan. The U.S. Department of Energy (DOE) also provided a $4.1 million grant towards the overall $5.5 million project, and the state had just under $1.5 million to finance for the project’s completion. With the public/private funding mechanism, there was zero cost to taxpayers, more than $8 million in utility savings, and more than 91.2 million pounds of carbon emissions were offset. An important piece of the arrangement included a careful auditing by an accounting firm of future energy savings to attract bank loan financing, with savings of $100,000 in heating and cooling costs expected the first year with higher savings for each subsequent year expected to be about 3 percent (Colorado State Capital, 2012; and Casey, 2013).

5. Other Areas of Sustainability Finance

As a growing sub-field of sustainability finance, there are many other different areas including insuring against catastrophe events with climate change, carbon finance and carbon pricing and markets, environmental risk assessment, and financial products, and how to incorporate environmental and social factors including savings and costs and risks in financial decisions, such as capital budgeting techniques.
5.1 Catastrophe Bonds and Derivatives

Another financial area in terms of sustainability is protection against climate change related events. With climate change affecting weather patterns, catastrophe bonds often called “cat bond” and catastrophe derivatives. Insurance companies and even government, such as Haiti, can use catastrophe derivatives to hedge against losses from hurricanes and other catastrophic events. The Insurance Futures Exchange had more than 3,100 contracts traded when it started operations at the end of September 2007 to early January 2008. Catastrophe futures are also traded on the Chicago Mercantile Exchange and NYMEX, with Swiss Reinsurance and Deutsche and ICAP, a large interdealer broker also involved. An advantage of catastrophe derivatives for insurance companies is that reinsurance for large events can be limited, resulting in a serious gap. Energy-traders wanting to hedge the price of a commodity against a hurricane-induced rise can also use these derivatives as a time of insurance (Challis and Gould, 2009). Catastrophe bonds are another way to hedge against climate risk, which are rated, freely traded by qualified investors and a way for investors to enhance the risk/return profile of their portfolios since they are uncorrelated with global financial markets. Indexes on these bonds are also available, such as the Swiss Re Cat Bond Total Return Index (see Cat Bonds Demystified, 2012). Pricing of catastrophe bonds and derivatives is a controversial area and worthy of further research in the finance area.

5.2 Carbon Finance, Pricing, and Climate Exchanges

Although the U.S.’s Climate Exchange (CCX) closed at the end of 2010, carbon pricing and the carbon offset market and carbon taxes remain as important discussions for ways to curtail carbon emissions worldwide. The European Climate Exchange (ECX), although prices have fluctuated and fallen with political problems, continues, along with the Chicago Climate Futures Change. The European Environment Agency (EPA) provides data and maps and information datasets on energy and water use (www.eea.euroopa.edu).

Sonia Labatt and Rodney R. White (2007) provide an excellent overview of carbon finance and the financial implications of climate change as well as a book on Environmental Finance: A Guide to Environmental Risk Assessment and Financial Products (Labatt and White, 2002). With California passing a carbon-reduction bill requiring a 25 percent reduction in state CO2 emissions by 2020 and some northeastern U.S. states signing on to a regional agreement for the reduction of CO2 emissions and greater concern over climate change at the federal level, carbon pricing and finance will remain an important area of finance that practitioners and students of finance should be aware of. Also see Sandor 2012 for a discussion on the establishment of the Chicago Climate Exchange and good derivatives).
5.3 The Role of Finance and Sustainability Efforts

Within corporations the role of finance concerning sustainability is changing. A report by CFO research services with Jones Lang LaSalle (2008) includes a survey of executives that shows incorporating sustainability into the finance function as a work in progress, but that for many companies is considered a high level process. Interviews with finance executives also revealed that finance does play a role in the “environmentally conscious” investment of a company’s assets.

Key findings of the research included:

(1) a rising importance of sustainable business practices with four of five finance executives surveyed noting that they expected pressure to adopt these practices rising in the next five years;

(2) a support function for finance through decision support as the most prominent role in a company’s sustainability efforts:

(3) a lack of decision-making frameworks that take environmental factors into account and an inability to document a link between sustainability initiatives and shareholder value as barriers to increased finance area involvement in sustainability;

(4) companies are willing to allocate resources to a sustainability initiative even if customary investment hurdles weren’t met; and

(5) finance executives state they think companies will realize a number of benefits from sustainability efforts, including a rise in brand value and reputation enhancement (Jones Lang LaSalle, 2012).

Kerste, Rosenboom, Sikken, and Weda (2011, p. 9) in Financing Sustainability also note the role of finance towards accelerating a transition towards a more sustainable economy and society as follows:

“Finance plays a critical role in accelerating the transition towards a more sustainable economy and society. For example, significant additional investments in clean energy infrastructure are needed to meet the growing energy demands and to address the threat of climate change. New financial instruments like green bonds and index-linked carbon bonds may help spur the transition towards a low-carbon economy. Sustainable investment approaches have the potential not only to stimulate sustainable business practices, but also to generate better risk-adjusted financial returns.”

Some corporations in their sustainability reports note the use of ESG factors in their capital budgeting decisions including adjusting cash flows and discount rates for environmental and regulatory risk factors, although no formal methodology has been derived. There has also been work on corporate greenhouse gas target setting. Autodesk in particular has developed a corporate finance approach to climate-stabilizing targets called C-FACT. The methodology allows for verifiability, flexibility, and fairness based on the Intergovernmental Panel on Climate Change (PCC) report that for climate stabilization to happen greenhouse gas (GHG) emission must fall by 85% by 2050. C-
FACT frames this as a call for companies to reduce GHG emissions in proportion to their relative contribution to the economy. With the C-FACT methodology, a company’s GHG footprint is divided by the company’s contribution to GDP (measured by gross profit divided by world GDP and estimated growth rates through 2050) to derive a Carbon Intensity Reduction Rate. Companies then select a time frame and commit to a public target.

The reduction goals are then annualized over a commitment period to reduce the short-term volatility and come up with annual reduction goals, with adjustments made at the end of the year taking into account new GDP numbers, actual financial performance, and a company’s actual carbon footprint. Once overall company intensity targets are derived, this can be translated to corporate and division-level absolute targets, whereby each division gets clear orders and can make investments that are based on business cycles (see Autodesk, 2010 a,b).

6. Summary and Conclusion

This paper discusses the need for the inclusion of sustainability into the field of finance and particularly in the academic side in terms of both education for business students and providing research and new theoretical approaches to assist businesses to develop tools to evaluate environmental, social, and governance factors for corporate decision-making.

Sustainable finance is becoming more and more mainstream as a part of risk management and corporate social responsibility for most large Fortune 500 corporations, but in the field of finance, it is not yet part of the finance curriculum and academic research. All areas of finance have a part in doing this from financial institutions management, financial markets, investments, futures and options, and corporate finance, there is a significant need to incorporate sustainability as a part of the academic curriculum and much research needed to assist companies and practitioners in a new path where companies can profit and make substantial contributions to solving problems associated with environmental, social, and governance challenges with new threats associated with climate change and scarcity of natural resources, and other societal problems.
References

Autodesk C-Facts Questions and Answers (2010a),
 pdf at: www.autodesk.com/sustainable-design

Autodesk C-Fact: A Science Driven, Business-Friendly, and
 Transparent Approach to Climate Stabilization (2010b) at:
 www.autodesk.com/sustainable-design

Bouma, Jan Jaap, Leon Klinkers, and Marcel Jeucken (2002).Editors,
 Sustainable Banking: The Greening of Finance,
 Sheffied, UK, Greenleaf Publishing.

Byrd, John and E.S. Cooperman (2012) Do Shareholder proposals
 affect corporate climate change reporting and policies?
 International Review of Accounting, Banking and Finance
 4 (2), forthcoming.

Byrd, John and E.S. Cooperman (2013). Let’s Talk: An Analysis of the
 Vote vs. Negotiated Withdrawal Decision for Social Activist
 Environmental Health Shareholder Resolutions, Working Paper,
 University of Colorado Denver.

Casey, Chris (2013). Gold-domed icon transforms into gold standard
 of efficiency, Newsroom, University of Colorado Denver, accessed at:
 http://www.ucdenver.edu/about/newsroom/newsreleases

Cat Bonds Demystified: RMS Guide to the Asset Class, Risk Management
 Services (RMS), 2012, July 31, 2013, pdf publication online,

Challis, Simon and Jonathan Gould (2009). New derivatives market focuses on
 Catastrophe, New York Times Online, accessed on July 29, 2013, at
 http://www.nytimes.com/2008/04/01/business/worldbusiness/01iht-
 rtrinvest02.1.11576771.html?_r=0

Citicorp, Global Citizenship: “Commitment to the Environment,” accessed
 on July 29, 2013 on Citicorp’s website at:
 http://www.citigroup.com/citi/environment/index.html

Citicorp, 2012 Global Citizenship Report, accessed on July 28, 2013 at:

Colorado State Capitol upgrading to geothermal energy (2012),
 State of Colorado, Department of Personal & Administration,
Press Release, June 1, 2012.


KKR Green Portfolio (2013), KKR Website, Green Portfolio at: http://www.green.KKR.com/why-go-green


UN Principles of Responsible Management Education (UNPRME) At http://www.unprme.org
