

Investing in Climate Change 2010

A Strategic Asset Allocation Perspective

January 2010



Whitepaper available online: <http://www.dbcca.com/research>

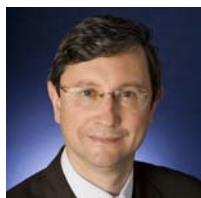


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Editorial



Kevin Parker

Member of the Group Executive Committee
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It's now possible to say that even following extreme volatility in markets, investing in climate change produces out-performance. In our latest report we put hard facts and figures behind this claim. The results may come as a surprise to anyone but the most seasoned climate change investors.

We demonstrate, for example, that a simulated investment portfolio with a 6% allocation to climate change would have outperformed a benchmark portfolio over the last 3-5 years. The out-performance would in fact have amounted to an extremely respectable 0.7% over the benchmark. In other words, climate change is not merely an investment sector that may hold future promise; it is a sector that has already delivered and is continuing to deliver. That is why we believe institutional investors should be shifting their asset allocation towards climate change. For fiduciary reasons, if for no other, they should be seeking out this attractive source of alpha.

Although past performance is no guarantee of future performance, we continue to believe in the long term trends of global demographic growth and increasing energy use (producing massive carbon emissions) that lead to global warming. The scientific evidence is clear, and grows ever more detailed, that we are perilously close to causing an irreversible and catastrophic change in the earth's climate. The shift to a low-carbon economy to mitigate global warming will require the creation of new technologies, industries and jobs on a massive scale. The absolute imperative to prevent climate change is therefore also, I believe, the economic and investment opportunity of our lifetime.

But as we have always argued, before private investors will commit large amounts of capital to the sector there must be transparent, long-term and certain regulations governing carbon emissions, renewable energy and energy efficiency. Investors, in short, need TLC. The lack of a binding international agreement on any of these issues at the Copenhagen summit last December has understandably created uncertainty in the minds of many potential climate change investors. This is unfortunate because what matters far more is that national and local governments all over the world are not waiting for a supra-national framework. They are already pushing ahead with their own policies that will do far more than international regulation in the short to medium term to stimulate private investment.

In the run-up to, and the three weeks after the summit ended in December, there have been more than 25 major new policy announcements from nations and states worldwide. They include new and amended Feed-in-Tariffs by China, India and Taiwan. Brazil, Japan, the UK and South Korea all announced new measures, and in the US the Environmental Protection Agency has proposed raising the standard for smog-causing pollutants.

All this new national legislation is a hugely encouraging sign that many countries not only understand the urgency of the climate change problem but see the competitive advantage of moving towards a low carbon economy. However, it also means that for the foreseeable future, climate change investors will need to focus on the quality of regulation provided by individual countries because big disparities exist between countries in the degree of regulatory TLC they provide.

We believe these disparities will, over time, translate into massive differences in the amount of investment capital countries attract and the jobs they create in renewable energy and other climate change industries. Investment capital will find the best returns, wherever they are. Countries that fail to provide them will get left behind.

Please enjoy our report and the fresh insights it provides into the emerging opportunities of climate change investing. You can find further ground-breaking research on the same topic at our web site, dbcca.com.

Letter



Mark Fulton

Global Head of Climate Change Investment Research

At the start of 2010, we set the outlook for drivers of climate change investing and put this into the context of strategic asset allocation. In order to do this, we begin by reviewing what happened over the past year.

As the global economy entered a serious recession in 2008, we looked forward to 2009 as a year when climate change related sectors would rebound in the vanguard of a recovery as governments applied “green stimulus” in the face of the economic recession, the need to create jobs and the need for continued economic support for clean energy incentives.

In general, this has proved to be the case in the last twelve months, although the lag in stimulus dollars means that markets have had to anticipate this effect to some extent. In public equity markets, many key climate change related sectors, such as energy efficiency, have performed better than the overall world equity markets from the 2009 trough. While inflows into venture capital and private equity slowed, they reached a turning point by the middle of 2009 and have begun to increase again. Renewable infrastructure projects continued to move ahead, particularly in Europe with support from Feed in Tariffs, although the U.S. suffered, reflecting its less robust policy structure.

While the United Nations Framework Convention on Climate Change (UNFCCC) COP 15 meeting in Copenhagen did not deliver a legally binding global deal to curb greenhouse gas emissions, the Copenhagen Accord shifted the focus to countries taking action and reporting it individually. Our research for much of the year focused on the key developments in policy and investment markets at a country level and what we termed as an “on the ground” level. We continue to believe that for the next few years this is where investors have to stay focused and that policy will continue to be developed at a country and regional level. Hence, we will continue our emphasis on monitoring these trends and assessing country and regional policy risk through our “global climate policy tracker” database.

Indeed, our investment thesis has always emphasized the importance of policy for driving returns in climate change sectors. As we look ahead over the next two years, mandates and standards and innovation policy rather than carbon markets will be the key catalysts. Many mitigation technologies still require incentives to be commercially viable. While solar PV costs have declined rapidly and learning curves in many other technologies offer the potential for cost improvements as they scale, the economics still remain challenging without policy support. Moreover, the weak economy and lower gas and coal prices keep fossil fuels highly competitive. The carbon “externality” is still priced through carbon markets where they exist but most importantly through mandates, standards and incentives until such time as robust liquid and hedgeable carbon markets develop. Interestingly, with companies looking for cost-cutting options in the face of difficult economic conditions, the sector with the greatest potential for mitigation is energy efficiency. Here the issues are behavioral barriers and upfront costs. Mandates and standards with financing provisions can save money in the long run while delivering fairly immediate net economic and social benefits.

Our climate change investment thesis remains very much the same for 2010. Global government stimulus will be at its peak, although that means public equity markets will start to look through this as the year progresses and focus on other fundamental drivers. But infrastructure developers will lay the foundation for projects with long-term cash flow characteristics as they commence their projects and PE/VC investors will also benefit from the stimulus. Meanwhile commercial and residential real estate is poised for a slow recovery but the green building sector is growing rapidly again being encouraged by government action. Timber is becoming more interesting as potential U.S. carbon markets look to forestry offsets. Biomass is also looking more viable for base load energy generation and offers co-firing opportunities with coal. Opportunities in water and agriculture also look interesting.

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Letter

In this report, we have put climate change opportunities into a more general asset allocation framework to illustrate the positive impact that the climate change space can contribute. This is complex given that asset allocation itself is very much under review to draw from the lessons that can be learned from 2007-2009. Investors have different objectives, of course, and there is no one size fits all strategy with some coming from a more “Environmental, Social and Governance” (ESG) perspective while others are purely focused on maximizing absolute returns. In this context, public equities can provide solid returns with liquidity, such as in the climate change sectors, but volatility is inherent and there are strong interrelated correlations across the asset class as a whole. Private equity and venture capital (PE/VC) investment will have a higher risk/return trade off with low levels of liquidity, but clean technologies offer good prospects. We believe that the climate change related infrastructure sectors should be of great interest to investors looking for moderate risk, long-term cash flows linked to economic growth and innovation policies with longevity.

We use an aggressive overweight of 6% allocated to climate change sectors, compared to a 2% global market capitalization benchmark. At a sector level, we have not made any specific tilt towards the four major sectors of clean energy, energy efficiency, water or agribusiness. In the long run, we believe that all of these sectors are attractive. Using historical returns of 19% from climate change sectors, an excess of 12% over the benchmark, applying them to the total portfolio yielded an extra 0.7% of return to the total portfolio. On an ongoing basis, a more conservative assumption would be a 5% excess return from climate change sectors, which would give an additional 0.4% to the total portfolio.

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I. Climate Change Investment Thesis and Opportunity

- 1 Demographics, socio-economic change and long-term energy demand drive increased global consumption of scarce resources
- 2 These drivers result in rapidly increasing emissions and corresponding changes to the earth's climate
- 3 DBCCA has established "Four Pillars of Climate Change" investment to provide an analytical framework for understanding the investor response to climate change
- 4 The scale of mitigating/stabilizing our climate will require unprecedented economic growth, which will result in low-carbon prosperity and job creation
- 5 Climate change must be understood in the context of an integrated framework of both halting and adapting to its effects
- 6 The climate change investment universe is broad, covering many technology sectors and themes
- 7 These sectors and themes are applicable to a variety of asset classes
- 8 Investors will pursue many different strategies across these asset classes, each with different risk attributes and environmental impact
- 9 A strategic risk premium for climate change, such as carbon beta, can be applied to traditional portfolios to analyze risk and optimize return

II. Government Policy: Pricing the Climate Change Externality and Encouraging a Supply Side Response

- 1 Lower carbon energy policy sits within the framework of overall climate policy, energy security and a desire to create jobs
- 2 Governments are mobilizing capital into low-carbon energy sectors, with ~\$500 bn in stimulus focused on sectors that can deliver a volume response
- 3 As a result, a significant number of jobs are expected to be created from such government policy initiatives
- 4 In addition to job creation, government policy support has the ability to help low-carbon technologies achieve grid parity, leading to scale-up
- 5 The scale-up of low carbon technologies is also related to carbon and energy prices. The two are distinct but related; traditional commodities are likely to increase in the long-term, driving the shift towards alternative sources of energy.
- 6 However, though energy commodity prices are expected to increase in the long-term, they have been volatile
- 7 Low-carbon technology adoption can also be accelerated through the role of subsidies. As of now, fossil fuels are more heavily subsidized than renewable energy, but renewables subsidies are increasing
- 8 All together, current government initiatives and the economic environment have led to low carbon technologies to sit within the context of costs, adoptability and ultimately, their abatement potential
- 9 Governments can utilize three broad policy levers to address these deployment barriers
- 10 An idealized view of the current policy regime is one of enabling relationships between various policy levers that enhance the effectiveness of emissions reduction targets
- 11 Carbon pricing is also a key component; many policy regimes have begun to implement these
- 12 Many of these global policy initiatives have increased substantially over the past year and a half
- 13 Government policy support also remains a key focus for investors. There are three key drivers that investors look for in policy
- 14 The feed-in tariff is a preferred means of incentivizing the growth of clean energy, offering "TLC" to investors
- 15 The following outlines the key aspects of an advanced feed-in tariff design
- 16 The German example of policy, particularly via feed-in tariffs, driving job growth and investment provides a leading model for clean energy scale-up
- 17 While the German case study offers insight on the impact of government policy, climate change policy regimes vary substantially around the world, and often need to be assessed within their own context

III. Market Sizing of Climate Change Sectors

- 1 Climate change-related end markets encompass a range of sectors, providing a rich and diverse investment opportunity
- 2 It is important for investors to evaluate the abatement potential and capital expenditures within individual sectors and technologies
- 3 Many sectors are poised for significant growth
- 4 Many experts project that deployment of low carbon technologies will increase over the next 20 years

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- 5 In addition to low carbon technologies, the agriculture sector also requires additional support and investment
- 6 Food consumption has increased more rapidly in developing countries, as a result of the increased 'wealth' effect due increasing GDP per capita
- 7 Water demand also remains as one of the key sustainability challenges
- 8 However, water infrastructure is capital intensive, requiring additional investment

IV. The Investors

- 1 Investment mandates are both hierarchical and distinct. Many different types of investors will be interested in climate change
- 2 Major catalyst events drive investor interest in climate change sectors, supporting the underlying positive secular trend
- 3 The fund management industry has a large amount of capital to deploy
- 4 Institutional investors have embraced responsible investing and climate change as part of their mandates
- 5 NEF survey of asset managers shows increasing momentum towards clean energy investments
- 6 Institutional investors maintain interest in PE/VC and climate change sectors, according to NEF survey
- 7 American HNWIs' are under represented in global green investing, though wealthy investors have allocated heavily to green investments globally
- 8 Corporations are investing to lower their own carbon emissions

V. Climate change investment markets

- 1 Overall global investment in clean energy in 2009

Public Markets

- 1 Climate change outperforms the broader public equity market across all time frames
- 2 Global clean energy and energy efficiency both outperform the broader public equity market across all time frames
- 3 Global agribusiness and water also outperform the broader public equity market across all time frames
- 4 Consensus market forecasts for climate change sectors show large earnings growth expectations
- 5 Climate change sector correlations to the broader market and energy commodities
- 6 Equity raises have been volatile over recent quarters, with a decrease since mid-2008
- 7 Climate change-related mutual funds / ETFs have approximately \$40 billion of assets under management as of 3Q09

Private Equity and Venture Capital

- 1 Private equity / Venture capital in clean energy markets
- 2 Water venture capital investment has seen a recent downturn, though it remains a key area of investor interest. A rebound is likely with the influx of stimulus dollars to the sector.
- 3 There has been significant, but volatile investment into agricultural venture capital companies
- 4 Comparing IRRs shows that PE can generate outperformance

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- 2 Infrastructure growth estimates
- 3 Investment attributes vary by the stage of deal
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- 7 Investment in trends in water are not sufficient to meet growing needs

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VI. Strategic Asset Allocation

- 1 As investors, we use strategic asset allocation to optimize our portfolio in recognition of the massive scientific, governmental, and economic drivers creating the potential for alpha in climate change sectors.
- 2 Investment attributes vary by asset class
- 3 Strategic asset allocation involves comparing a standard portfolio and one integrating climate change. It returns the probability of achieving performance targets, which are calculated through a statistical model which includes standard portfolio weightings.
- 4 We created the Climate Change proxies for asset allocation and Calculate Portfolio Target Weights
- 5 The DBCCA view of forecasted Risks and Returns by Asset Class for Climate change Investors
- 6 Correlation matrix: Investing across asset classes can be used to diversify risk
- 7 Results for climate change sector allocations: We determined the probability of achieving our target return with overweighting to climate change
- 8 A portfolio incorporating climate change sectors offers a higher probability of achieving the target return

From Copenhagen to Low Carbon Prosperity

The Copenhagen Accord leaves us with a choice – we can decide the glass is half full or the glass is half empty. The majority of the analysis seems to suggest the latter because not only was there no legally binding agreement but also not even an agreed global emission reductions target. We, however, believe the “Glass is half full” largely because the coalition of those who want to take action expanded to the key emerging markets (China, India, Brazil, and South Africa) and the Copenhagen Accord was drafted by senior leaders of these four countries plus the President of the United States – an unprecedented outcome in international negotiations and one that provides an important foundation toward a more ambitious international agreement based on this political understanding.

For investors in climate change sectors, this outcome will have little impact for the next few years outside of the carbon markets themselves, if they fail to develop as a result of the lack of a global agreement. Indeed, in our research we have been saying that carbon markets are only going to affect investment decisions in the long-run as it will be many years before a robust, stable and hedgeable carbon price emerges. Certainly, offset markets and carbon permit trading are affected if there is failure to reach agreements under which cap-and-trade systems can flourish. But even here, domestic and regional legislation can still push ahead to establish carbon markets at a national level. The big challenge for 2010 is the U.S. cap-and-trade legislation that presently is in discussion in the Senate. There is still hope this can be passed.

The Copenhagen Accord recognizes that policy will be enacted at a national and regional level rather than at a supranational level. All countries have been asked to report their commitments and plans for climate action by January 31 2010. Many of these targets have been announced. Governments will be driven not just by the climate debate itself but by the realization that the green economy produces investment and jobs – low carbon growth or prosperity – and can improve national competitiveness. For some countries energy security is also a key driver, notably some of the key players in the Copenhagen Accord - the US and China. (This approach seems more likely to be sustainable than a complex 193 (99.9% sure) country negotiation process.) There will certainly continue to be an attempt to reach a global and legally binding deal but this is not a sure path.

Hence, we continue to emphasize and track policies that drive investment and measure these against our key investor criteria of TLC – transparency, longevity and certainty. In fact, this approach sits well with what the Copenhagen accord really appears to be trying to do – record, monitor, and in many cases verify what both developed and developing countries are doing.

Outcome of Copenhagen negotiations

1 Long-term global target	Recognizes 'scientific view' to hold warming to below 2°C; review in 2015 on whether to tighten to 1.5°C. Agreement to peak emissions 'as soon as possible'.
2 2020 target for industrialized countries	No agreement on individual or aggregate targets. Industrialized countries to submit targets by 31 January 2010
3 Low carbon growth plans in developing economies	No formal agreement on individual or aggregate targets. No commitment to low carbon growth plans, but acceptance of a registry for Nationally Appropriate Mitigation Actions (NAMAs) and 'provisions for international consultation and analysis under clearly defined guidelines' to ensure action is credible. Developing (emerging) economies to submit NAMAs by 31 January 2010.
4 REDD	Crucial role of REDD+ recognized, but fundamental consensus on detailed implementation lost in final Accord. Initial funding of USD3.5bn from 2010-12 agreed
5 Adaptation	Recognition of the need for urgent action on adaptation particularly in most vulnerable least developed countries.
6 Technology Transfer	Creates a new Technology Mechanism, but no agreement on the proposed Climate Technology Centre and Network.
7 Finance	Commitment of USD30bn in public finance for 2010 to 2012. Commitment of USD100bn in public and private financial flows to developing countries by 2020 "in the context of meaningful mitigation actions and transparency on implementation". Establishment of High Level Panel to investigate sources of finance. Establishment of a new 'Copenhagen Green Climate Fund'.
8 Carbon Markets	No agreement on how to scale up carbon markets. Decision on carbon capture and storage (CCS) and nuclear postponed to 2010. Modalities defined to allow developers to appeal against UN panel rejections of CDM projects.
9 International Transport	No agreement to start negotiations on international transport
10 Trade	No mention of trade implications

Source: UNFCCC, HSBC, Citi, DBCCA analysis, 2010.

Executive Summary

An allocation to climate change investments belongs in portfolios.

- *Market drivers for climate change investments remain robust driven by mandates and innovation policy. Our 2010 Outlook is bullish for public markets, private equity / venture capital and infrastructure investments.*
- *At a macro level, climate change investment involves a unique blend of technology innovation, environmental protection, national security, and economic recovery.*
- *Climate change investment covers several key areas – clean energy, energy efficiency, agriculture and water, and is a secular beneficiary of global growth trends, particularly in developing markets. Overall, clean energy, energy efficiency, water and agribusiness managed to outperform the world equity markets from the bottom of the market through the end of 2009. They also exhibit outperformance on a three year basis.*
- *The investment attributes of climate change sectors apply to a broad spectrum of asset classes. Infrastructure project finance is the heart of capital flows in these sectors and needs to attract institutional capital to deliver the volume response necessary for climate change abatement in the capital intensive power generation sector.*
- *Climate change investment as a percent of total market size by asset class has grown rapidly. Investors should consider overweighting climate change in their portfolios in light of the size and secular growth potential of the theme.*
- *Our analysis demonstrates that on a historical basis, inclusion of climate change sectors in a portfolio improves expected returns. At a sector level, we have not made any specific tilt towards the four major sectors of clean energy, energy efficiency, water, or agribusiness. In the long run, we believe that all of these sectors are attractive.*

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A look back at 2009 and forward to 2010

What we thought would happen: Our 2009 investment thesis

"In our view, as the financial markets stabilize, many climate change sectors should recover early in both public and private markets, as they have regulatory support and strong long-term growth prospects" ---Investing in Climate Change 2009: Necessity and Opportunity in Turbulent Times, October 2008

A Look Back at 2009: What did happen?

Diversification strategies through the market meltdown across sectors and even asset classes did not work as financial theory would have suggested. The extreme nature of the cycle, self reinforcing feedback loops and withdrawal of credit from financial services resulted in a market failure requiring government intervention.

- Risk aversion remained high through 1Q09 and then equity markets began a vigorous rebound starting in March when it became clear that governments would take broad and coordinated action using all available instruments in the policy toolkit.
- Major global economic stimulus policies were enacted across the board, with “green” sectors accounting for about \$500 billion of investment and maximum deployment set to occur in 2010.
- Recognizing that governments were pumping liquidity into the system, global markets began to recover sharply and by 2Q09 were in a solid uptrend. Within the climate change universe, the rally was led by sectors requiring low capital investment such as energy efficiency.
- In private markets, there was a sharp slowdown in deal flow in the private equity and venture capital (PE/VC) space to mid year because of the scarcity of credit. By 3Q09 conditions began to improve but were still much lower year-over-year.
- The collapse in natural gas prices, which are now uncorrelated with oil and trading at a historic discount, raises challenges for renewable energy break-evens.
- On the policy front, Copenhagen negotiations did not result in a legally binding agreement.

What we think will happen: Our 2010 investment thesis:

Across asset classes, climate change investment is growing rapidly relative to the broader market. It provides a distinct and identifiable source of alpha to portfolios with strong secular support. Climate change sectors have already shown outperformance against the world benchmarks, and we believe that the underlying regulatory frameworks will continue to support the theme's strong long-term growth prospects. As a result, investors should consider a larger weighting to climate change investments. Relative over and underweights of course depend on individual benchmarks and specific investment policy mandates.

Climate change investment thesis and opportunity

Long- term global demographic trends and increasing energy demand are causing global warming, or climate change, from fossil fuel combustion and the accumulation of greenhouse gas emissions (GHG) in the atmosphere. The economic and environmental consequences are potentially severe. In order to address this challenge, governmental policy can indirectly and potentially directly put a price on the externality of GHG emissions. Moreover, energy security and the development of low-carbon growth paths have emerged as significant priorities following the recent economic recession.

In turn, an industrial response to this “new” cost of doing business will create new products and markets, both from a risk management perspective and also by creating new technologies and services. While the deployment of these technologies

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is challenging due to high upfront costs, long asset lives and exit barriers in many GHG emitting sectors, the transition to a lower-carbon economy appears likely given the policy momentum. The large size and breadth of the secular investment cycle is investable through a variety of vehicles including public equities, private equity, venture capital and infrastructure funds.

Public market performance of climate change sectors

	From Market Bottom**	1 Year	3 Year
MSCI World	69.7%	27.0%	-7.1%
Global Clean Energy / Technology*	87.9%	39.7%	15.0%
Global Energy Efficiency*	125.6%	70.7%	87.2%
Global Agribusiness*	77.3%	63.6%	103.6%
Global Water*	73.6%	28.2%	15.9%

* WilderHill New Energy Global Innovation Index (NEX), CRB Research Energy Efficiency Index, DAXglobal Agribusiness Index, S&P Global Water Index

** Market bottom refers to 2009 low of MSCI World on March 9, 2009

Source: Bloomberg, CRB Research, DBCCA analysis, 2010.

Government drivers

In order to achieve the scale of the transition needed to respond to climate change from one of low carbon productivity to one of high carbon productivity, the world will have to increase productivity on a scale faster than that achieved during the industrial revolution. The longer we wait the more limited our options.

Carbon is a classic externality in an economic sense – it represents a market failure to price the full cost on the environment. Hence, government intervention to recognize this is warranted and, based on the magnitude of the gap we have identified, will need to accelerate dramatically to ensure a response by the end of the decade given the lag between policy implementations translating into market action. This can take the form of direct carbon pricing, tax and cap-and-trade programs that limit emissions, or, indirectly through incentives, mandates and standards and complementary policies. Pricing the externality can also take the form of direct spending for procurement reasons and placing limits on the emissions generated within the supply chain.

In the face of the global recession governments have realized the potential for job creation from green sectors. Over the past two years, we have seen significant stimulus bills supporting clean energy, energy efficiency and other sectors, while seeking to stimulate the economy and create jobs.

However, in the long run, policies that encourage private investment are crucial. Carbon markets have only really been established in Europe although the US, and Australia are looking at them and implementation over the next five years seems probable based on proposed policies and regulation. Post Copenhagen it looks less likely we will see a legally binding deal ushering in robust carbon markets any time soon. But that will not derail the policy momentum at the local, state and national government levels. Therefore, in the near term, government mandates and incentives will be required to spur capital deployment at the regional level.

As investors, we essentially look for Transparency, Longevity and Certainty (TLC) in assessing the potential success of policies. Incentive policies, such as Feed-in-Tariffs (FITs), which we think are particularly effective, along with mandates and standards, and emissions targets are being set on a global basis and all support climate change sectors. DB Climate Change Advisors (DBCCA) tracks global policy targets and programs, and has classified them into three categories: traditional regulation, emissions targets, and incentive policies. We use this analysis to understand the 'policy momentum'

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in the climate change space, noting that governments are increasing their commitment to supporting the sector. The number of global policies has grown rapidly over the past year, with particular growth seen in incentive policies. Emissions targets have grown slowest, though this is to be expected, as they represent the highest level of climate change policy hierarchy and therefore have the broadest application.

Market sizing of climate change sectors

The growth potential of climate change markets can be estimated by looking at long-term forecasts of energy, food and water demand, which are driven by population change and resources availability. Of course, these trends need to consider the emissions aspect of the new supply, hence creating the demand for new low-carbon products, such as alternative energy, highly efficient crops and plentiful quality water resources.

Power generation and energy storage both for power and transport will continue to be a key demand driver as regulatory constraints intensify and limit emissions. Additionally, energy efficiency, both at the building scale as well as the electric grid scale is also requiring new investments in technology and infrastructure with measurable lifecycle savings. According to New Energy Finance, \$97 billion in 2008 and \$92 billion were allocated to clean energy infrastructure. However, to close the gap as estimated by the IEA in the energy sector, \$10 trillion additional funds are required through 2030 to meet total demand, which translates into \$500 billion per year.

Moreover, the last few decades have seen unprecedented population growth, mostly in developing countries and the increasing per capita GDP is increasing dietary calorie and protein demand. While short-term demand may fluctuate and certainly saw a contraction in 2009 with the economic downturn, the long-term trend of needing to double agricultural production by 2050 is still intact. Not only does this put pressure on our land and energy resources, but also on our water resources. Water demand is increasing rapidly, with consumption coming across multiple sectors. Clean water for drinking and hygiene as well as industrial and agricultural use are essential to our economy and livelihoods, and this water supply is in significant decline. The direct link between food and water is incredibly important and impacts almost all points of the economic value chain for both developing and developed societies.

Investors

Transitioning our economy from its current state into a low-carbon economy requires enormous investment. Who will provide this capital? Public sources of capital will be necessary, but the majority of the burden will fall to the private capital markets. The private capital markets is made up of pension funds, insurance companies, endowments and foundations high net worth individuals (HNWI) and families as well as corporations. These investors have a diverse set of needs and interests, risk tolerances, return expectations and investment time horizons.

We set out in this paper to describe how these investors can pursue climate change investment opportunity through evaluating how they have performed in the past, what we forecast and how an investor can use strategic asset allocation to capture alpha opportunities from these markets while maintaining their investment goals, whether it be liability driven such as pension funds, wealth accumulation for families, or mission driven for the endowment/foundation investor.

Institutional portfolios with Socially Responsible Investment (SRI) and environmental, social and governance (ESG) mandates have been obvious early adopters and climate change is likely to remain an important theme. However, given the strength of the economic case for climate change investment, pension funds, endowments and HNWI in general will be attracted to the opportunities. While the institutional investors we identify are, for the most part, in the developed world, plus

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some large sovereign wealth funds from China and the Middle East, many investments in deploying clean energy, advancing agricultural production and building water infrastructure will occur in both the developed and developing world.

Climate change investment markets

Markets are characterized by risk, return and correlation characteristics (for the use for investment diversification and risk mitigation). In our investment universe, we have a diverse set of market sectors, but also several different asset classes through which to pursue these sectors. These asset classes also have differing characteristics with regards to risk and return. In 2010, we expect the climate change sectors to continue to be a distinct investment theme versus the broader market, transcending several key asset classes, namely: public equity, private equity / venture capital and infrastructure.

2009 was characterized by the public markets hitting the bottom and climate change sectors recovering well after the crash of 2008. The out-performance of discrete climate change sectors such as energy efficiency, clean energy and agribusiness indicates that markets are responding to the broader economic demand of adapting to and mitigating climate change. This was clearly a source of excess return. Climate change sectors have outperformed the broader public market since the market bottomed in March of 2009. Agribusiness and energy efficiency have led performance, with all primary sectors showing strong returns over the last 3 years.

We expect continued earnings growth in 2010 for the Climate Change Sectors, especially building efficiency. When comparing performances of indices, we see that Climate Change and its constituent sub-indices, Agriculture, Clean Energy and Water have all outperformed the MSCI Global Index. From the time period of 2006 through the end of 2009, many of the climate change sectors exhibited some level of correlation. However, the correlation with oil has diminished despite its volatility. Year-to-date, sector correlations have been extremely high due to the breakdown of the economy late last year and the recent recovery boosted many sectors in a similar direction. We expect that some degree of sector correlation will continue to be part of the climate change theme. However, we believe that sector specific investments will continue to outperform the broader market indices.

Private equity and venture capital have distinct investment characteristics from public equity markets. They are mechanically different asset classes with different liquidity, average holding periods and business maturities. As such, valuation methodologies and expected returns are more wide-ranging for PE/VC compared to public equities. Private equity and venture capital investments did see a fall off in 2009 overall, but did begin to pick up in late 2009 through investments, capital raising and private companies going public. Several studies of PE/VC return profiles have been published showing significant positive performance over various time periods, such as 2003-2007, 2006-2008. While there have been outsized realized returns, many of these investments in these studies are unrealized, and we should be cautious in our return expectations for the sector and seek to comprehensively understand risks. In PE/VC investments, the time horizon is at least 5 years or 10 years long. There are a variety of investment stages (capital allocated, committed, drawn-down, invested, distributed) and different valuation methodologies (not market priced, less frequent). More importantly, the return measurement (internal rate of return, vintage year returns instead of time-weighted, annual returns) now subject to FAS 157 ("fair-value"), which requires mark-to market valuation may give some investors more transparency into their holdings.

Project finance markets and therefore infrastructure investments were hampered this past year by the credit crisis. While project finance slowed down in the US, Europe continued to deploy capital into renewable energy projects, due to the policy structures in place such as feed-in tariffs. While there was a drop off in capital flows to projects in the US, we do expect in 2010 a return to 2007 and 2008 levels. Project finance markets are also on the rebound globally for new-build renewable energy developments. We believe this trend will continue, bolstered by governmental stimulus and policy, the easing of credit markets and the accelerated learning curves and cost declines in low carbon technologies. Of course, as pointed out

Executive Summary

earlier, the demand for renewable energy projects continues to grow as new capacity comes online and old capacity is converted in lower-carbon power generation. The reasoning is two-fold: increased government stimulus and subsidies as well as the loosening of the credit markets, post-crash.

Infrastructure growth is projected to be robust over the next decade. We expect at least \$10 trillion dollars of infrastructure investment overall, to be deployed globally into a variety of projects over the next 5-10 years, with a significant component going to water (50%), power (22%) and critical infrastructure for agriculture such as roads and rails (19%). As emerging economies develop and developed economies need to rebuild and renovate infrastructure, governments as well as private capital will be deployed to meet growing demand for services and public goods, such as water, energy and food.

Strategic Asset Allocation: Returns volatility and correlation

Investors need to consider both the climate change related drivers of investment as well as the traditional characteristics and attributes of various asset classes. The nature of investments varies largely by asset class and investors will have distinct risk and return requirements based on their individual needs. We believe that opportunities exist in many asset classes for climate change and there are distinct opportunities in infrastructure, private equity / venture capital and public equity strategies.

We developed a Strategic Asset Allocation (SAA)¹ to consider climate change as part of portfolio construction. For each given asset class, we estimated the percentage of climate change total market cap out of the total market and used this as our benchmark for asset allocation. We then derived predicted returns, volatilities and correlations using historical data.

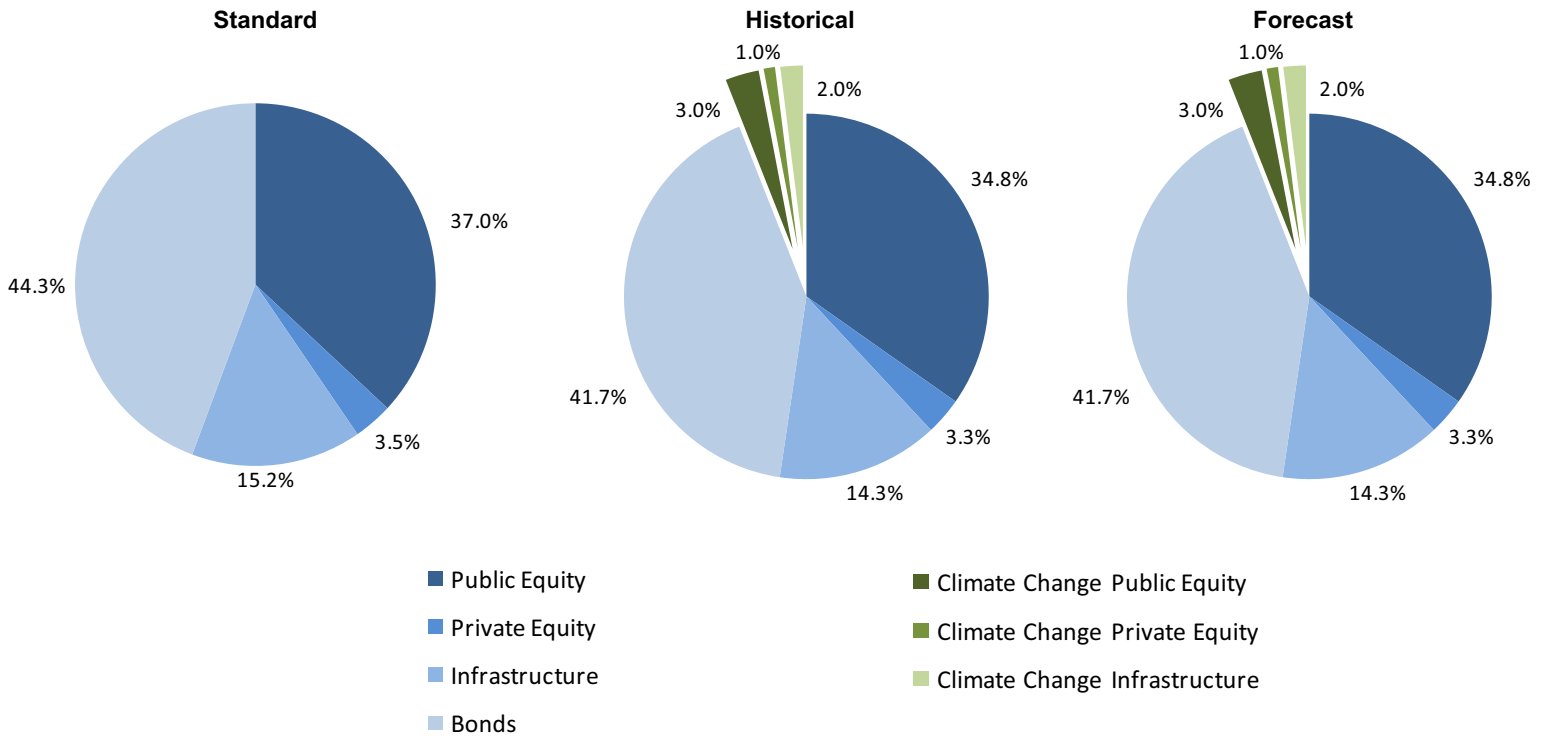
We establish benchmarks for climate change sectors from their weightings in markets. We overweighted public equities from 1.5% to 3%. For Private Equity, our weighting to climate change sectors resulted in an overweight from 0.03% to 1%. And infrastructure, our weighting to climate change sectors resulted in an overweight from 0.61% to 2%. This results in a total allocation of 6% to the total portfolio. At a sector level, we have not made any specific tilt towards the four major sectors of clean energy, energy efficiency, water, or agribusiness in either private equity or infrastructure. In public equities, the sectors are weighted proportionately to their market caps, reflecting our view that in the long run, these sectors are all attractive.

We use an aggressive overweight of 6% allocated to climate change sectors, compared to a 2% global market capitalization benchmark. Using historical returns of 19% from climate change sectors, an excess of 12% over the benchmark, applying them to the total portfolio yielded an extra 0.7% of return to the total portfolio. On an ongoing basis, a more conservative assumption would be a 5% excess return from climate change sectors, which would give an additional 0.4% to the total portfolio. We did this by selecting a specific return target of 6% for the portfolio, which allowed us to analyze the probability of reaching that target.

¹ DB Advisor Quantitative Strategies Group: Joe Wong, CFA Portfolio Manager, Asset Allocation strategies and Portfolio Choice; Inna Okounkova, Head of Strategic Asset Allocation Portfolio Management

Executive Summary

Model portfolio allocation with and without climate change sectors



	Standard Portfolio without Climate Change	Portfolio Using Historical Climate Change Returns	Portfolio Using Forecast Climate Change Returns
Target Portfolio Return:	6.00%	6.00%	6.00%
Statistical Tests			
Probability of Outperforming Target Return	57.94%	59.58%	58.59%
Simulated Mean Return	8.73%	9.39%	9.11%
Simulated Volatility	10.76%	11.30%	11.30%

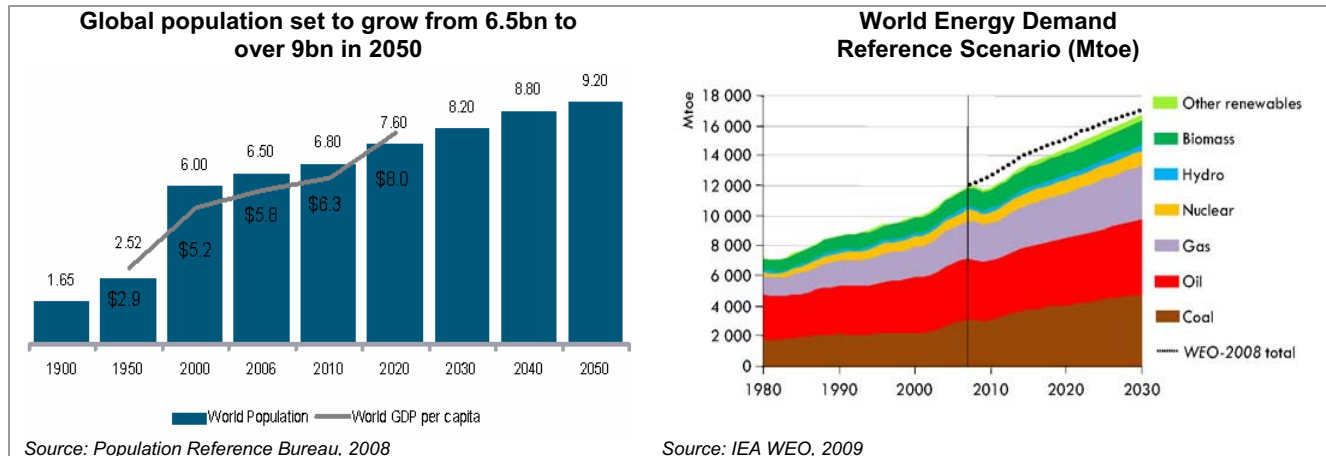
Source: DBCCA analysis, 2010. For illustrative purposes only. Please note that simulated results have inherent limitations. The results do not represent results of actual trading using client assets, but were obtained by the retroactive application of constraint assumptions to model allocations as described herein. No representation is being made that any account will achieve profits or losses similar to those shown. These simulated results do not reflect the deduction of investment advisory fees. A client's return will be reduced by advisory fees and any other expenses that may be incurred in the management of its investment advisory account. Past performance is not guarantee of future results.

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I. Climate Change Investment Thesis and Opportunity

Demographics, socio-economic change, and long-term energy demand drive increased global consumption of scarce resources.



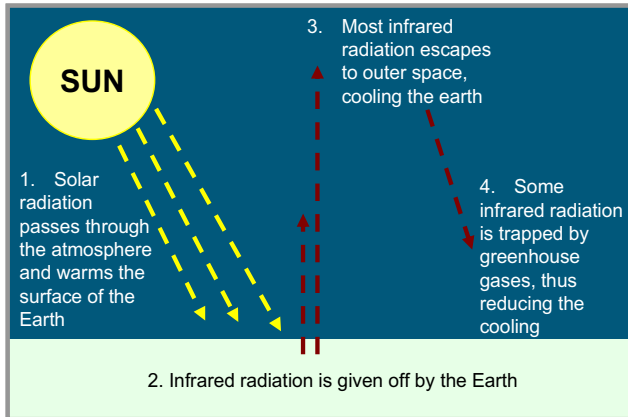
Consumption of resources, as shown by energy demand, is driven by a rapidly growing global population, with social and wealth trends enhancing the impact. This is really the starting point of the thesis: Can technology developments continue to deliver enough resources as they have in the past 200 years of rapid growth but now subject to more stringent environmental constraints?

- World population is growing rapidly, set to increase from approximately 6 billion people in 2000 to over 9 billion by 2050. Over the last century it has increased ~290% from 1.55 billion in 1900. According to the World Population Bureau, 2009 population was 6.8 billion. The WPB also states that “global population numbers are on track to reach 7 billion in 2011, just 12 years after reaching 6 billion in 1999. Virtually all of the growth is in developing countries.” (source: <http://www.prb.org/Publications/Datasheets/2009/2009wpds.aspx>)
- Much of the growth comes from developing countries. GDP per capita is forecast to increase rapidly, with a corresponding rise in the levels of consumption at a country and individual level.
- The recent economic downturn has slowed the growth rate of many countries, but global growth is still predicted to increase in coming years particularly in emerging economies.
- Global energy demand is set to increase for all energy types, including carbon intensive traditional fossil fuels. It is highly sensitive to economic growth rates as illustrated by emissions forecasts contained in our recently published Global Climate Policy Tracker.

I. Climate Change Investment Thesis and Opportunity

These drivers result in rapidly increasing emissions and corresponding changes to the earth's climate.

The Greenhouse Effect



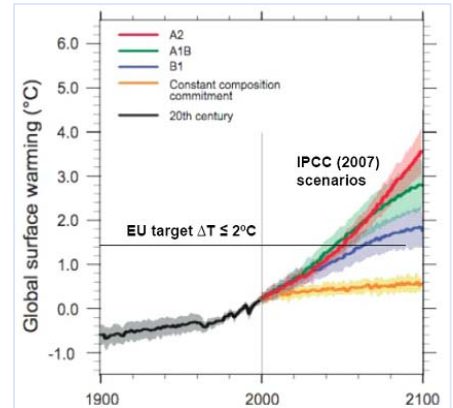
Source: DBCCA analysis, 2007.

Under BAU much bigger disruption is coming

Last time T was 2C above 2900 level was 130,000yr BP, with sea level 4-6m higher than today.

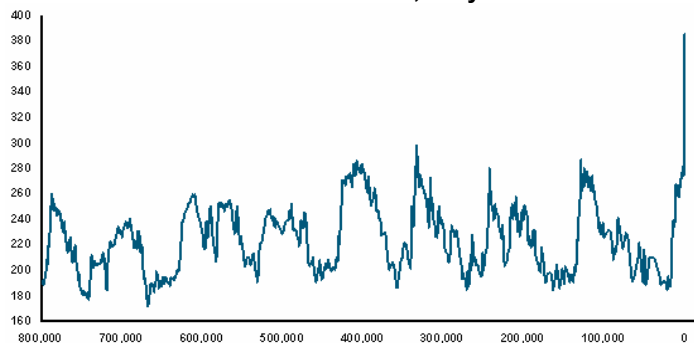
Last time T was 3C above 1900 level was ~30 million yr BP, with sea level 20-30m higher than today.

Note: Shaded bands denote 1 standard deviation from mean in ensembles of model runs



Source: IPCC, 2007

CO2 dates back 800,000 years



Source: Nature Journal, DBCCA analysis, 2009.

DBCCA Carbon Counter



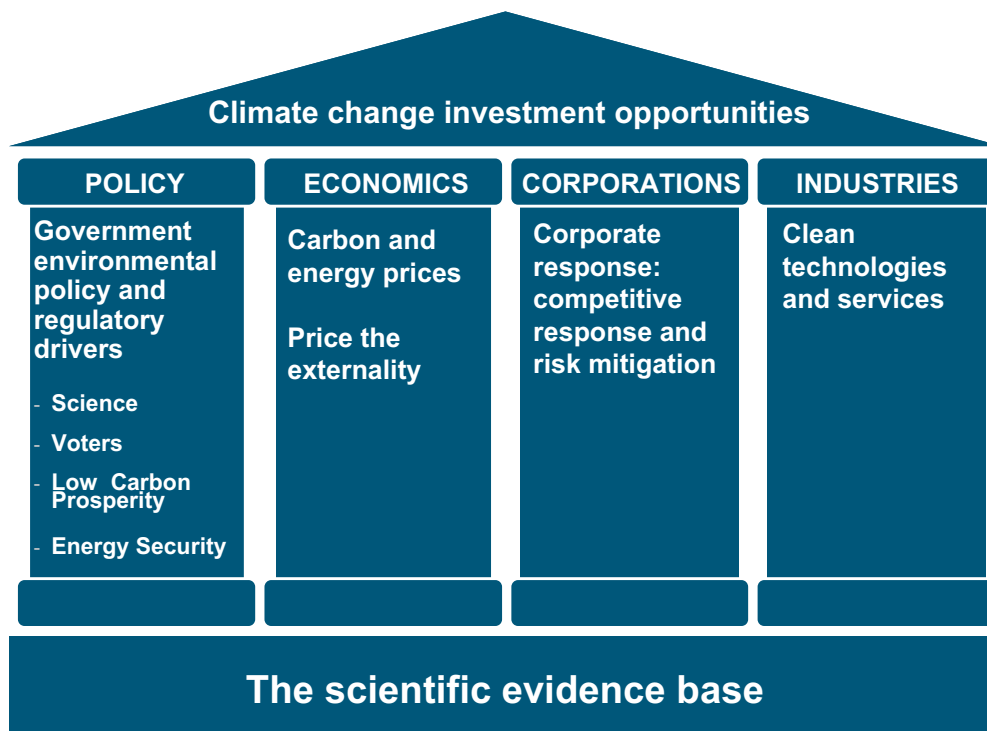
Source: DBCCA

These demographic trends and the rapid growth of global consumption, result in the massive emission of greenhouse gases, causing global climate change.

- For instance, the current atmospheric concentration of CO₂ is around 385ppm, which represents an increase of nearly 40% over pre-industrial levels of 280 ppm.
- Under business as usual projections, atmospheric greenhouse gas concentrations, measured on a CO₂-equivalent basis – which take into account both CO₂ and other gases, such as methane and N₂O that contribute to global warming—are set to rise beyond 600ppm by 2050. There is general consensus in the scientific community that this cannot be allowed to take place, at the risk of catastrophic warming.
- While there continues to be debate about the science, evidence appears to be strong on any credible basis. New climate models, which incorporate non-linear feedback loops, demonstrate that at each heightened concentration of greenhouse gases, the potential warming is much higher than originally thought.
- DBCCA's carbon counter offers the world's first real-time display of greenhouse gas concentrations in the atmosphere. At 3.6 trillion tons this is equivalent to 467ppm as this is the gross amount of GHG concentrations before aerosols are netted off. It is increasing at approximately 2 billion metric tons per month and in 2009 increased by ~22.4 billion metric tons or 2.9 ppm. This trend is expected to continue into 2010 at a similar rate.

I. Climate Change Investment Thesis and Opportunity

DBCCA has established 'Four Pillars of Climate Change' investment to provide an analytical framework for understanding the investor response to climate change.



Source: DBCCA analysis, 2009.

Investors will respond to the effects of climate change. Their responses can be understood through the framework of the "Four Pillars of Climate Change Investment."

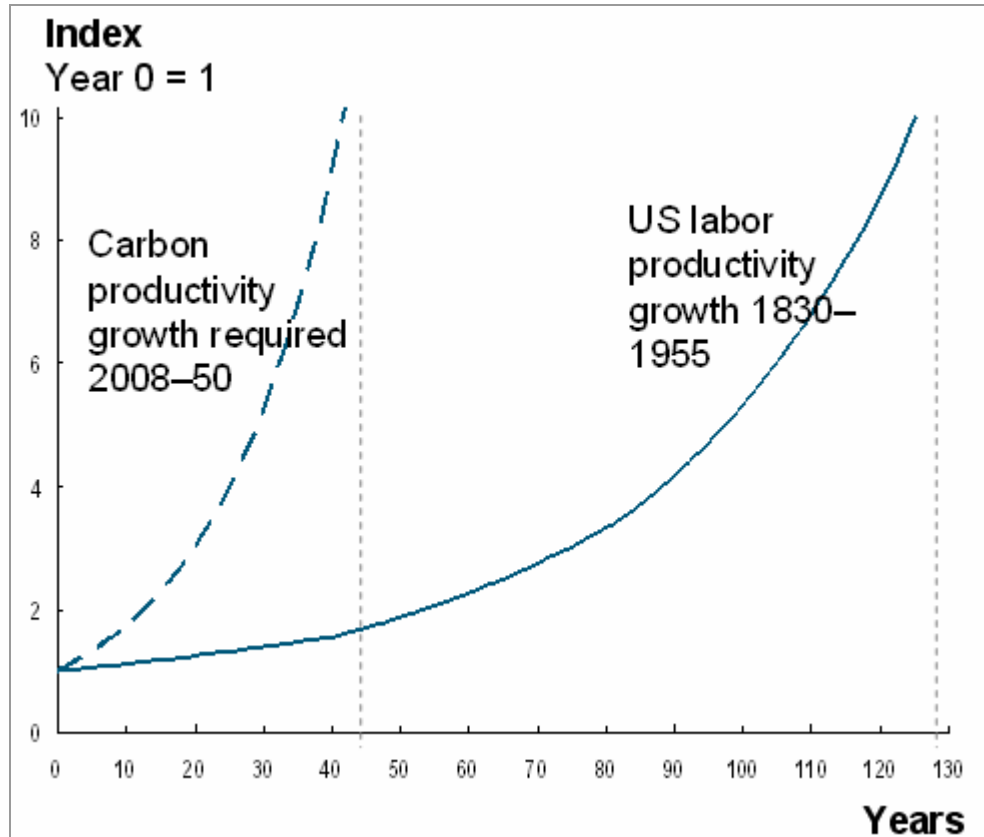
The four pillars of analysis we have identified are:

1. Government environmental policies and regulations – these are driven by the scientific base and public opinion and increasingly by the realization that the “green revolution” can create jobs in a net sense. For many countries energy security remains a key issue as well.
2. Economics / carbon prices – Carbon then has to be recognized as an externality and priced either directly or more indirectly through mandates, standards and incentives.
3. Action by corporations – corporations can then choose to act to help solve the problem through their corporate strategies, taking the opportunity set, and or respond to the risk that climate change itself poses
4. Low-carbon technologies and services – at a product and service level this will produce the clean technology industries and create new growth opportunities.

In 2009 we continued to see all aspects of the 4 pillars in action as governments continued to enact more policies, particularly around green infrastructure investment in the face of the recession, more countries such as the US and Australia worked on cap and trade systems to price carbon directly and companies continued to expand clean technology products and services and respond to potential risks. In 2010 we see this trend continuing with again more emphasis on job creation and country level plans to incentivize clean technologies. The US can still move to establish a cap and trade system.

I. Climate Change Investment Thesis and Opportunity

The scale of mitigating / stabilizing our climate will require unprecedented economic growth, which will result in low-carbon prosperity and job creation.



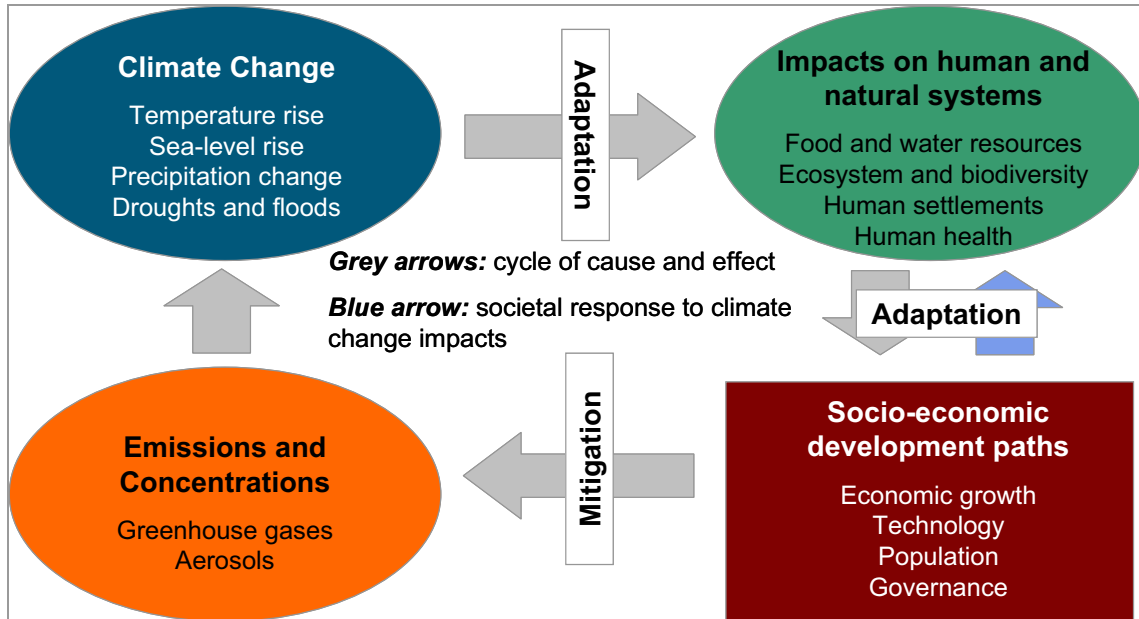
Source: *Contours of the World Economy 1 – 2030 A.D.*, Maddison, 2007; McKinsey analysis.

In order to achieve the scale of economic transition needed to respond to climate change, the world will have to increase productivity on a scale faster than that achieved during the industrial revolution. The sheer magnitude of the economic challenge provides governments to use this opportunity to create jobs.

- Achieving the increases in carbon productivity required to meet longterm stabilization targets will require a revolution on the scale of the Industrial Revolution. But while, in the Industrial Revolution, it took over 120 years for labor productivity to rise 10- fold, we have only 40 years to achieve a commensurate increase in carbon productivity.
- Some of the challenge in raising carbon productivity will lie in a massive decarbonization of the world's infrastructure. Over the past 150 years, thousands of cities, airports, highways, power plants and factories have been built – many of which rely on fossil fuels and carbon-intensive processes. We are entering a period of massive capital stock turnover in the next few decades.
- Much of the aging infrastructure in the West will need to be replaced, and the global infrastructure base will expand dramatically as China, India and the rest of the developing world continue to rapidly industrialize. Where infrastructure investments are climate-friendly – such as many investments in water, agriculture, renewables, energy efficient buildings and public transport – they fit the broader climate change investing theme.

I. Climate Change Investment Thesis and Opportunity

Climate change must be understood in the context of an integrated framework of both halting and adapting to its effects.



Source: IPCC Climate Change 2001: Synthesis Report – Summary for Policymakers

The investor response will vary and must be understood in the context of an integrated framework of adaptation and mitigation.

- Mitigation (also called abatement) is intervention by humans to reduce the sources of greenhouse gases or decrease their environmental impact on the world.
- Adaptation is adjustments in practices, processes, or structures to take account of changing climate conditions.
- Climate change investment has primarily centered on mitigation efforts to date – emissions reducing technologies such as energy efficiency or renewable power generation are examples of this.
- Increasingly, investment will also focus on adaptation sectors, such as clean water and sustainable agriculture.
- Additional information on the need for sustainable agriculture investment can be found in DBCCA's June 2009 white paper: Investing in Agriculture: Far-Reaching Challenge, Significant Opportunity: An Asset Management Perspective (www.dbcca.com/research).

I. Climate Change Investment Thesis and Opportunity

The climate change investment universe is broad, covering many technology sectors and themes.

Cleaner Energy	Environmental Resources	Energy & Material Efficiency	Environmental Services
Power Generation <ul style="list-style-type: none"> ▶ Solar ▶ Wind ▶ Clean coal (capture, sequestration, infrastructure) ▶ Other clean power generation (geothermal, hydro, methane capture) ▶ Increased efficiency ▶ Fuel switch: gas, biomass ▶ Nuclear 	Water <ul style="list-style-type: none"> ▶ Desalination/purification ▶ Wastewater treatment ▶ Distribution and management 	Advanced Materials <ul style="list-style-type: none"> ▶ Advanced coatings ▶ Lightweight substitutes ▶ Solvents & biodegradables 	Environmental Protection <ul style="list-style-type: none"> ▶ Land conservation ▶ Environmental restoration ▶ Timberland ▶ Forestry ▶ Sea defences
Clean Tech Innovation <ul style="list-style-type: none"> ▶ Infrastructure mgmt. ▶ Supply chain mgmt. 	Agriculture <ul style="list-style-type: none"> ▶ Irrigation innovation ▶ Clean pesticides ▶ Consumer food purity ▶ Seeds & breeding technologies 	Building Efficiency <ul style="list-style-type: none"> ▶ Building mgmt. including green data centre mgmt ▶ Heating and cooling systems ▶ Lighting systems ▶ Insulation & materials ▶ Micro generation/micro CHP 	Business Services <ul style="list-style-type: none"> ▶ Insurance ▶ Logistics ▶ Green focused banking ▶ Microfinance ▶ Consultancy/advisory ▶ Intellectual property
Transport <ul style="list-style-type: none"> ▶ Emissions reduction ▶ Propulsion systems ▶ Battery technology 	Waste Management <ul style="list-style-type: none"> ▶ Recycling ▶ Toxin management ▶ Waste to energy ▶ Land remediation 	Power Grid Efficiency <ul style="list-style-type: none"> ▶ Transmission (including smart grids) ▶ Distribution (incl. home area networks, smart devices and meters) ▶ Storage: Batteries, CA, flywheels, pump storage ▶ Infrastructure ▶ Energy mgmt. systems 	Carbon credit developers
Sustainable Biofuels <ul style="list-style-type: none"> ▶ Bio-diesel ▶ Ethanol 		Enabling Technologies <ul style="list-style-type: none"> ▶ Lasers ▶ Others 	

The climate change investment universe covers a broad and diverse set of sectors.

- The climate change investment universe includes all companies that provide any of a diverse range of goods and services that further mitigation or adaptation to climate change.
- We have identified four broad sectors :
 - Clean(er) energy - in 2009 we decided to emphasize cleaner energy so that in particular the potential for gas as a transition fuel with lower emissions than coal could be recognized under fuel switch. Biomass is even a zero emissions option here.
 - Environmental resources management including agriculture and water,
 - Energy and material efficiency and
 - Environmental services. Combined, these sectors represent a fast-growing multi-hundred billion dollar marketplace, which offers numerous and compelling investment opportunities.
- We expect the sectors related to adaptation to play an increasingly important role in the future, but current investment has focused heavily on the mitigation side.
- Nonetheless, financial investors are able to invest across all sectors.

I. Climate Change Investment Thesis and Opportunity

These sectors and themes are applicable to a variety of asset classes.

Asset Class	Public Equity	VC / PE	Infrastructure
Attributes • Clean Energy • Environmental Resource Management • Energy and Material Efficiency • Environmental Services • Policy and regulatory support for many sectors	<ul style="list-style-type: none"> • Broad opportunity set for diversification across universe • Diversified large companies where climate change is making an impact • Pure play established companies • Emerging micro-cap from VC/PE cycle 	<ul style="list-style-type: none"> • Emerging technology cycles • Capital requirements • Invest along the value chain e.g. <ul style="list-style-type: none"> • Solar • Biofuels • Smart grid • Batteries • Etc. 	<ul style="list-style-type: none"> • Established sectors with: <ul style="list-style-type: none"> • Solid cash flows • Low volatility • Large capital requirements • Government supported • Public transport • Pipeline, e.g. water and CO₂ • Electricity grids
			Real Assets <ul style="list-style-type: none"> ▪ Real Estate ▪ Timber / Forestry

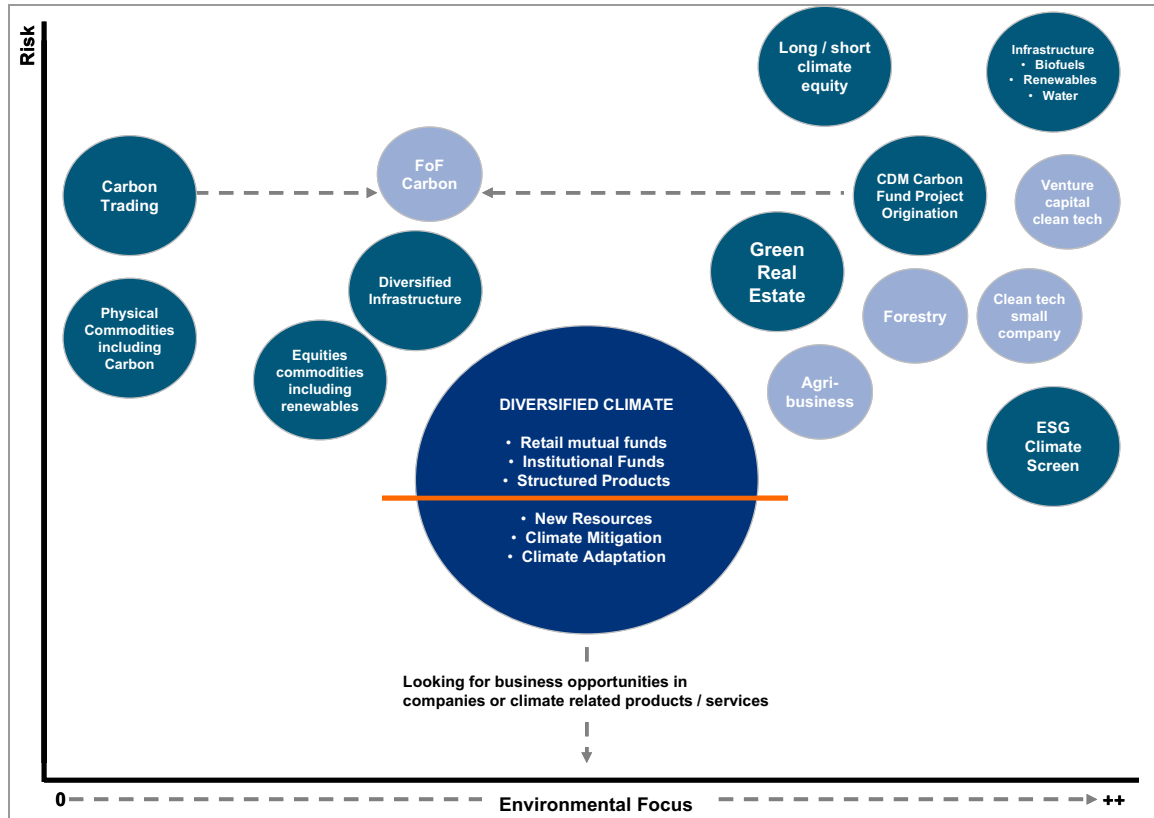
Source: DBCCA analysis, 2009.

Climate change investment is applicable to a diversified set of asset classes offering investors a broad set of strategies to pursue.

- Key asset classes are associated with a set of climate change attributes to match their suitability.
- Investment attributes provide background for different asset classes and climate change sectors offer investment opportunities across all stages of the investment spectrum from venture capital through to listed equities.
- It is deep knowledge of investment attributes that provides investors with an information advantage.
- In 2009 we added into our matrix two emerging investment areas in Green Real Estate and Timber / Forestry.
- Mitigation-related public equity focuses most on mature well-developed technologies such as clean energy and energy efficiency. Many of the adaptation sectors are already very mature industries (water, waste, and agribusiness), with climate change / sustainability options emerging as investment strategies within them.
- Private equity / venture capital allows investors the opportunity to directly access emerging technology plays.
- Clean energy, water, and agriculture can be accessed across all asset classes, while investors interested in green buildings will be restricted to a more limited spectrum of options. Over time, as technologies mature, these opportunities will expand from earlier-stage opportunities within private equity / venture capital and move up the capital curve to later-stage opportunities in infrastructure and public equity.
- In 2010, we expect the climate change sectors to continue to be a distinct investment theme across asset classes. New technologies will emerge as key focus areas, but the overarching theme will remain strong.
- The coming deployment of global stimulus funds should particularly enhance project deployment for public equity and infrastructure opportunities.

I. Climate Change Investment Thesis and Opportunity

Investors will pursue many different strategies across these asset classes, each with different risk attributes and environmental impact.



Source: DBCCA analysis, 2009.

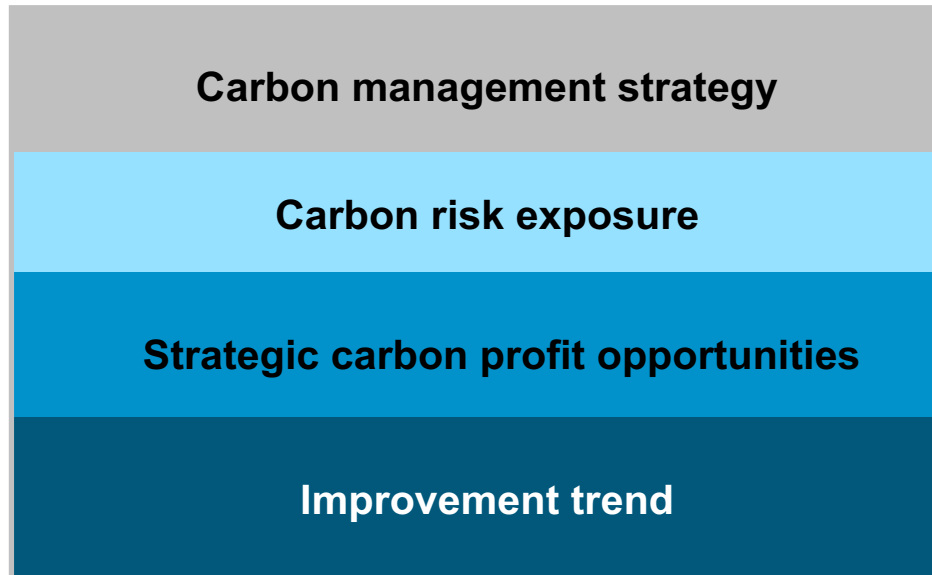
There are a large number of investment strategies that investors may pursue within the context of climate change asset classes.

- We look at different investment strategies in terms of their environmental focus and the different levels of risk they entail.
- Diversified equity climate strategies offer retail investors exposure at moderate risk and diversification against equity indices.
- Smaller but purer clean technology strategies will offer more diversification from equity indices with higher risks but may be more attractive to institutional investors.
- It is important for investors to consider their stated investment goals – these include considerations of risk, return, time horizon, and within the context of climate change investing, the potential environmental impact of the strategy they are pursuing.

I. Climate Change Investment Thesis and Opportunity

A strategic risk premium for climate change, such as carbon beta, can be applied to traditional portfolios to analyze risk and optimize return.

Company specific climate change risk has four dimensions, not one.



Source: Innovest Strategic Value Advisors, Risk Metrics.

Investors are developing tools to understand the impact of climate change on all sectors – not just those seeking to mitigate or adapt to its effects.

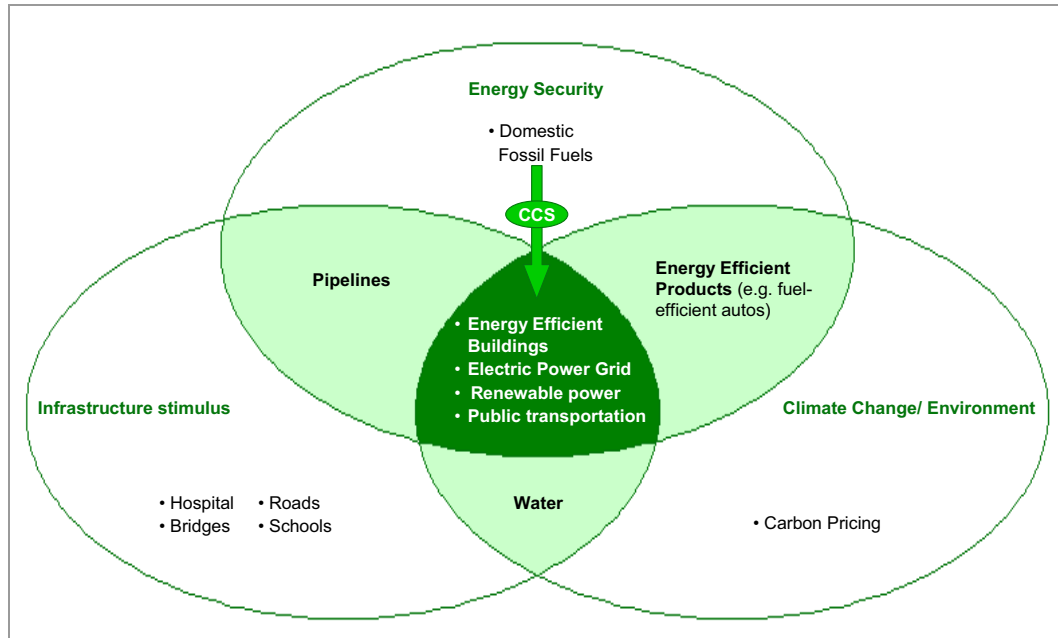
- At DBCCA we have chosen to look at Carbon Beta™ as an analytical framework that seeks to calculate the strategic risk premium of an equity's underlying exposure to the drivers and impacts of climate change. This has been made available to our portfolio managers in Asset Management.
- Similar to a traditional beta calculation, Carbon Beta incorporates four elements of climate risk to analyze and compare equities' exposure:
 - Carbon management strategy
 - Carbon risk exposure
 - Strategic carbon profit opportunities
 - Improvement trend
- The application of carbon beta to a portfolio has been demonstrated to generate outperformance. We expect that this outperformance will increase as the drivers of climate change become more acute in the economy and investors become more aware of the changing political landscape.
- Further into the future, we expect the incorporation of extra-financial data like Carbon Beta to become broadly recognized as the new 'normal' for investors.

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II. Government Policy: Pricing the Climate Change Externality and Encouraging a Supply Side Response

Lower carbon energy policy sits within the framework of overall climate policy, energy security and a desire to create jobs.



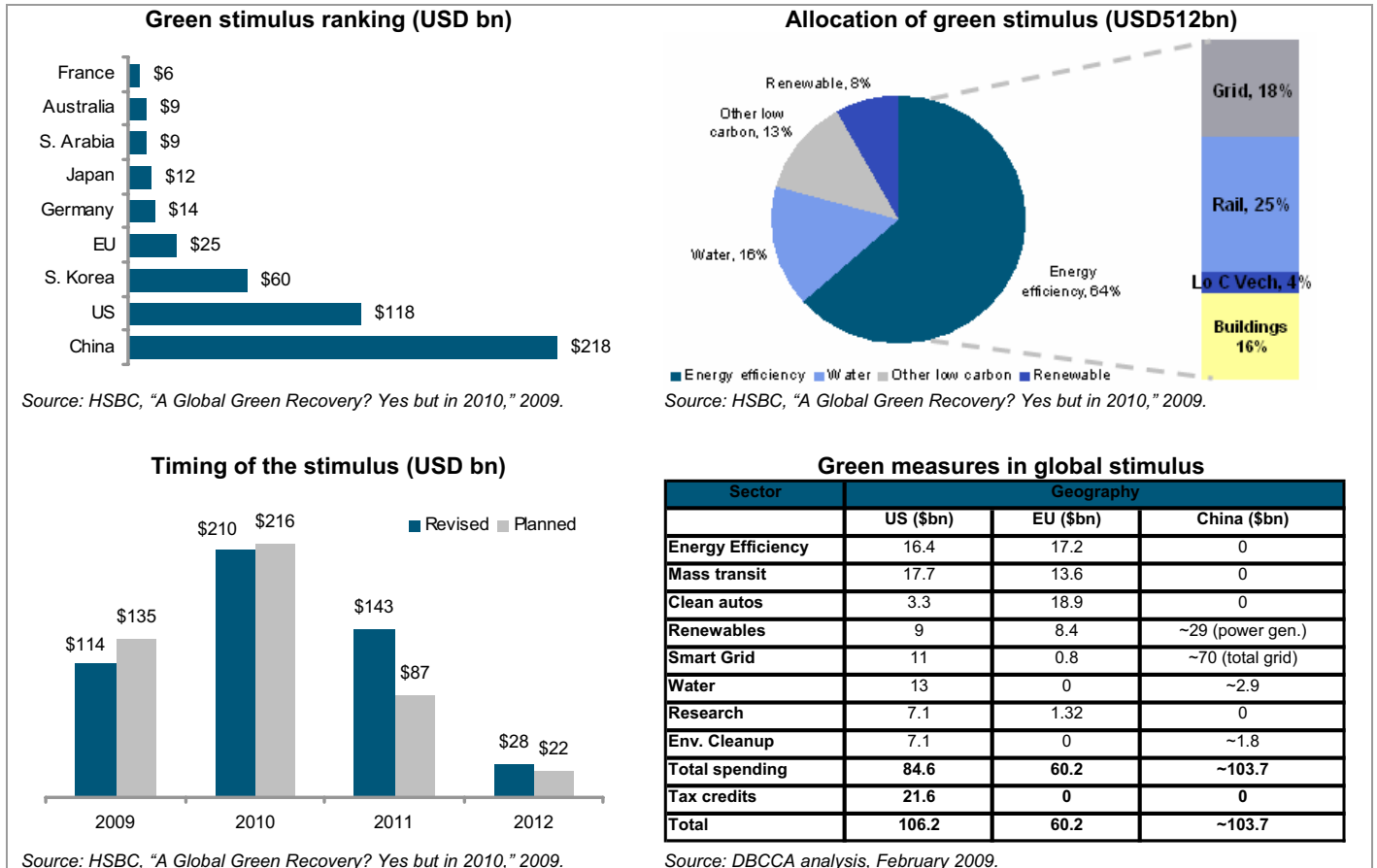
Source: DBCCA analysis, 2009.

Green related economic stimulus in the face of the recent recession seeks to achieve several overlapping and related political goals – energy security, climate change / environmental goals, infrastructure improvements and, importantly, local job creation.

- The inherent overlap of all of these goals can be achieved by a well-designed infrastructure stimulus plan - as discussed in DBCCA's paper: Global Climate Change Regulation Policy Developments: July 2008-February 2009.
- The world's governments have recognized this need and committed large amounts of capital to the theme during the round of stimulus funding during the current economic downturn.
- Our investment thesis states that this unprecedented level of government spending will drive global investment and development of green technologies in the next few years. Although the deployment of the government capital was somewhat delayed through the last year, consensus appears to be that much of the capital will begin to flow at a large scale in 2010.
- This influx of capital across the climate change sectors will be a major investment driver for the near future.
- One key point is high climate legislation impacts national competitiveness.

II. Government Policy: Pricing the Climate Change Externality and Encouraging a Supply Side Response

Governments are mobilizing capital into low-carbon energy sectors, with ~\$500bn in stimulus that can deliver a volume response.



Global stimulus plans have included extensive support for green sectors, with development spanning both sectors and geographies.

- Governments have pledged over \$500 billion to green measures in stimulus plans, illustrating the idea put forward by former US Vice President Al Gore that, "today's financial crisis can be a gateway to tomorrow's environmentally responsible economy."
- At a time when the global economy is stalling, unemployment is rising and poverty is threatening to overtake millions of people, we need new industry growth, job creation and the deployment of lower carbon technology and services.
- All three can be achieved by aggressively investing in a new "green" economy that can unleash a wave of financial and environmental prosperity and innovation.
- The most tangible economic and political outcome of these efforts would be job creation.
- Globally, the UK Prime Minister has estimated that up to 25 million new "green" jobs could be created by 2050 with appropriate supportive policy in place.
- These "complementary policies" can be designed to integrate with existing energy policies, mandates and carbon markets—e.g. incorporated into baselines— and should encourage technology cost reductions and a volume response, filling the externality gap until robust carbon markets develop.

II. Government Policy: Pricing the Climate Change Externality and Encouraging a Supply Side Response

As a result, a significant number of jobs are expected to be created from such government policy initiatives.

Source	No. of jobs actually/potentially created	Region examined	Timeframe	Other considerations
American Clean Energy & Security Act, as passed by the US House of Representatives	1,700,000	US	2020	Clean energy according Center for American Progress
UNEP, 2008. Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World."	470,000	Worldwide	2006	Wind and solar for countries where data was available
	624,000+	Worldwide	2006	Solar thermal for countries where data was available
	1,174,000	Worldwide	2006	Biomass for countries where data was available
	64,000+	Worldwide	2006	Geothermal and hydro for countries where data was available
	145,000	Germany	2006	Energy efficient retrofit jobs based on €19 billion public and private investment
	18,000	India	2009	Construction of natural gas buses
University of California, 2008. "Energy Efficiency, Innovation, and Job Creation in California."	1,500,000	California	1977-2007	Resulting from energy efficiency policies
	403,000	California	2008-2020	Efficiency and climate-action driven jobs taking into account the potential for innovation
US Metro Economics, 2008. "Current and Potential Green Jobs in the US Economy."	750,000	US	2006	By increasing renewable use and implementing efficiency measures
	2,500,000	US	2008-2018	By increasing renewable use and implementing efficiency measures
	4,200,000	US	2008-2038	By increasing renewable use and implementing efficiency measures
Political Economy Research, 2008. "A Program to Create Good Jobs & Start Building a Low-Carbon Economy."	2,000,000	US	Present potential	Based on spending \$100 billion in public funds in a "green" recovery program
Barack Obama, 2008. Energy and Economic Policies.	5,000,000	US	2008-2018	Based on \$150 billion stimulus
Gordon Brown, 2008. UK Renewable Program.	160,000	UK	2008-2020	Based on £100 billion stimulus
	25,000,000	Worldwide	2050	

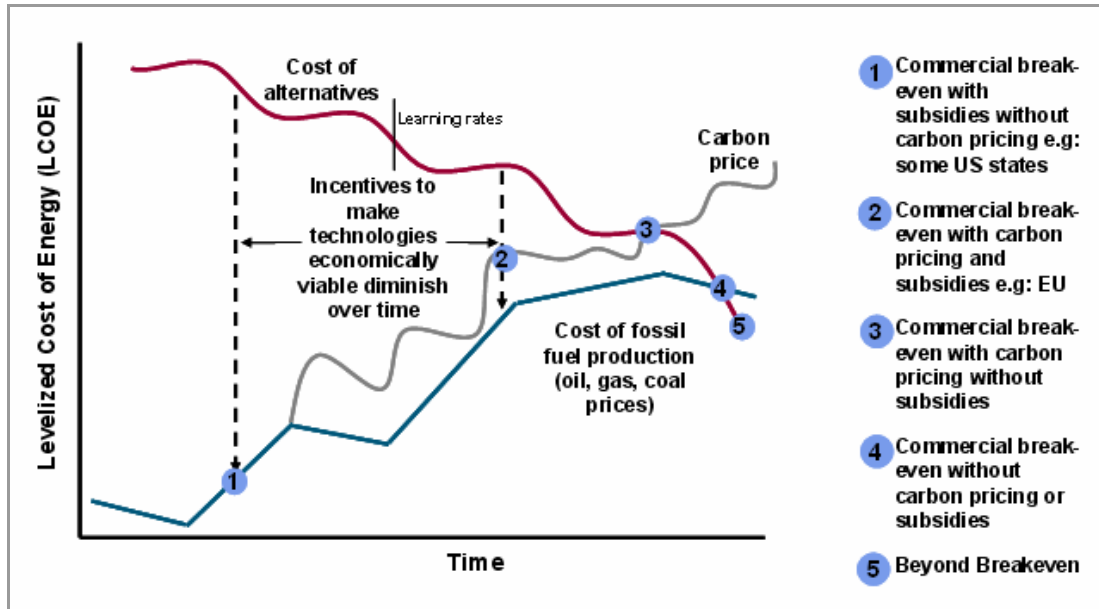
Source: DBCCA analysis, 2009.

A key focus of recent policy has been the development of 'green' jobs - the total global potential for job creation is large – and much is yet to be tapped.

- Due to the scope of job losses through the recent economic downturn, many studies have been conducted focusing on the amount of job creation potential from the development of green technology and services. Studies have ranged from forward looking to historical reviews, with a variety of geographies analyzed.
- The large potential for 'green' job creation indicates that governments will continue to support climate change sectors as a key lever to help move the world out of the downturn and stimulate local economies.
- Feed-in Tariffs (FiTs) for renewable energy are especially effective in stimulating new jobs; FiT policies in Spain and Germany have created approximately 500,000 jobs (gross), with benefits of the policy outweighing the costs.
- We expect that the majority of capital will be deployed by governments during 2010, with the corresponding positive benefits of its investment beginning to show up in the economy and in markets.
- Energy efficiency has been a major winner at a sector level, attracting more than 50% of total dollars allocated; moreover, energy efficiency public equities and index proxies were among the best performing climate change sectors in 2009, which we discuss in greater detail in the Climate Change Investment Markets section of this report.

II. Government Policy: Pricing the Climate Change Externality and Encouraging a Supply Side Response

In addition to job creation, government policy support has the ability to help low-carbon technologies achieve grid parity, leading to scale-up.



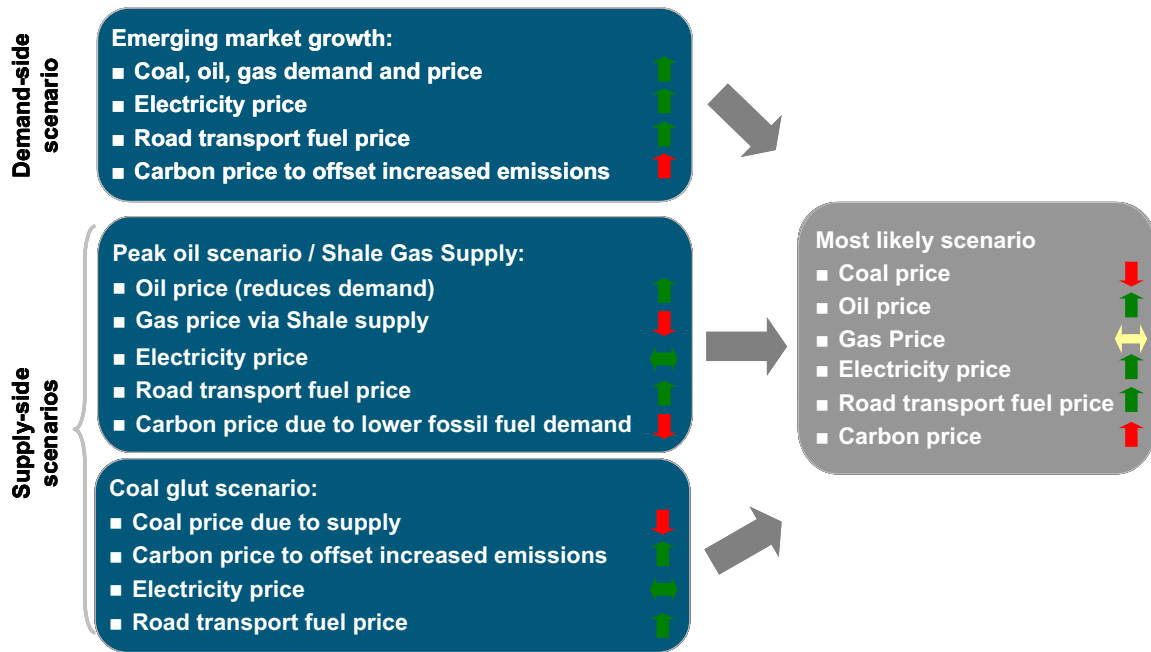
Source: DBCCA analysis, 2009.

The optimal approach would seem to be that complementary policies encourage technology cost reductions—e.g. an R&D subsidy proxy— until liquid carbon markets emerge to directly price in the carbon externality

- The blue line shows the trend of increasing fossil fuel prices since the late 1990s. Going forward, investors will have to track the relative commodity prices of oil, gas and coal, which are correlated over long time periods but have recently diverged. Natural gas price trends will be the primary driver of renewable LCOE in the absence of substantial declines in equipment costs. The carbon price, depicted by the grey line, drives up the cost of conventional energy by incorporating the externality.
- The cost of clean technologies, brought down over time by the learning rate, is shown by the red line. The cost has declined steadily due to large investment flows, economies of scale benefits, technical improvements and new innovations. Incentive schemes are depicted by the dashed grey lines. There are five “breakeven points” depicted by aquamarine circles and shown on the chart.
- Technologies will move progressively from breakeven point 1 through to breakeven point 5 depending on the market structure and incentives in place for different countries; more expensive technologies, such as carbon, capture and storage (CCS), will require a substantial carbon price to equalize their LCOE against traditional fossil fuel generation over the long run.
- A factor that shifts commercial break-even in the EU is feed-in tariffs. Over time, future feed-in tariff payments should be rolled back as renewables come down the learning curve and become less expensive. This is happening today with solar tariffs in Germany, which will be reduced in 2010.
- Once renewables reach breakeven points 3, 4 and 5, feed-in tariffs can be eliminated. At this point, the technologies will continue to be deployed without subsidies assuming there is a system in place for the renewable energy to integrate into the electricity grid.
- Low natural gas prices in 2009 challenged the economics of wind and solar in markets without feed-in tariff support. An additional headwind was the contraction in credit and tax equity financing. Nevertheless, solar and wind equipment unit shipments still grew at a healthy low double digit year-over-year rate in 2009.

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The scale-up of low carbon technologies is also related to carbon and energy prices. The two are distinct but related; traditional commodities are likely to increase in the long-term, driving the shift towards alternative sources of energy.



Source: DBCCA analysis, 2009.

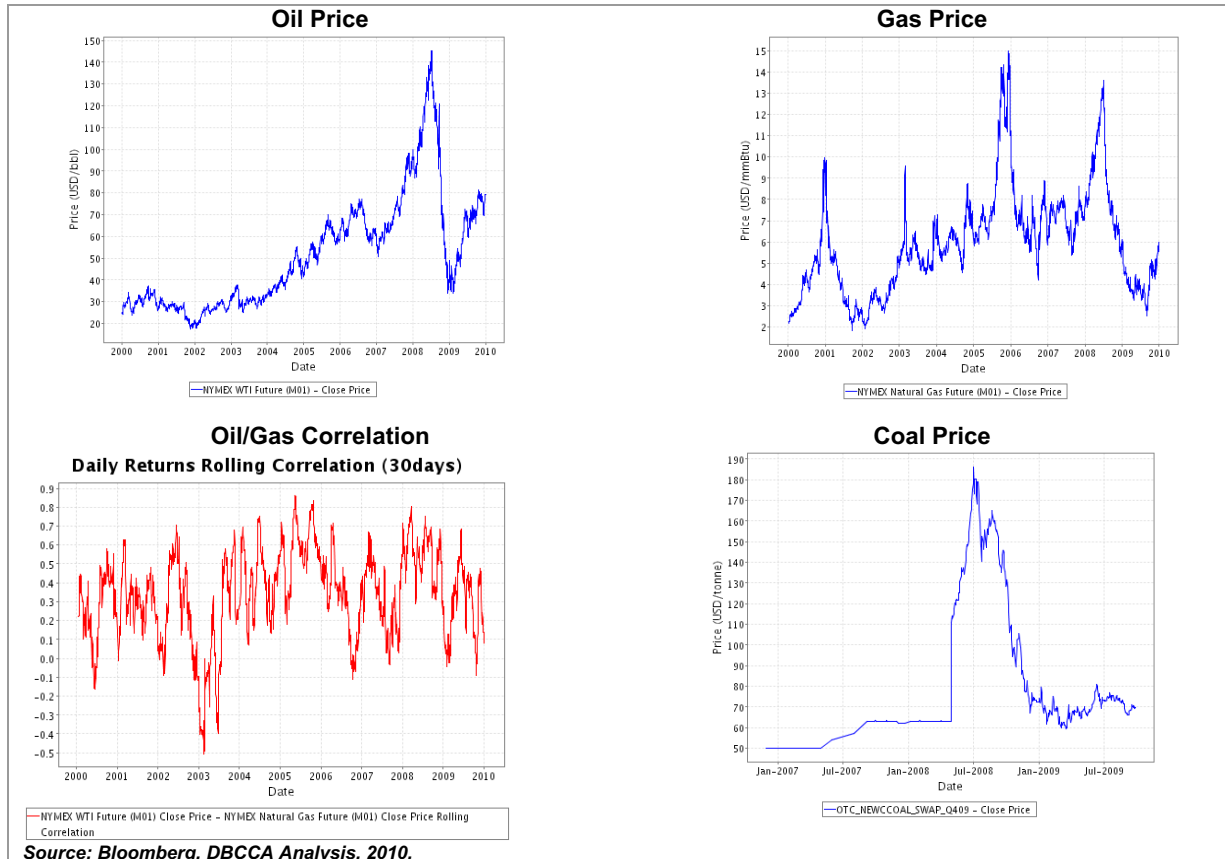
In the long-run, carbon and energy prices are likely to trend higher, creating a favorable competitive environment for clean technology particularly if learning curves accelerate.

As carbon markets develop in a broader set of regions and countries, the interrelationship between the relative commodity prices and underlying fundamentals of coal, oil, gas and carbon and their impact on power generation gross margins becomes more complex. At the simplest level, carbon prices (if sufficiently high): diminish demand for fossil fuels at the margin and; help cleaner energy sources become more competitive with fossil fuels.

- The correlation between fossil fuel prices and carbon prices depends on a number of factors – including which fossil fuel is under consideration and in the case of electricity markets the generation fuel that is at the margin. We have created several scenarios that outline the possible correlation between carbon prices and the prices of coal, oil and gas. In reality, multiple scenarios will exist simultaneously, and therefore overlap and interact.
- The primary near-term fundamental driver among commodities is likely to center around the emerging dynamic of a potentially rapid supply response from natural gas shale reserves and the emergence of a global LNG market to deliver swing supply and balance global markets. That said, we expect natural gas forward curves to remain volatile but within a narrower trading range; the extreme highs and lows witnessed over the past two years are unlikely to prevail in the short to medium term.

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However, though energy commodity prices are expected to increase in the long-term, they have been volatile.



Fossil fuel price trends remain a primary underlying driver for many climate change sectors, with much of the attention currently on natural gas pricing and supply.

- Global oil consumption may have peaked in 2007 – 2008. Many market commentators noted that production did not increase at the height of the oil price spike, indicating in part that additional supply was not available. Technical constraints and rising marginal production costs have limited a supply response to high price signals.
- Clean energy continues to compete directly with fossil fuels. Natural gas is now the primary driver of the marginal cost of electricity in most markets, forcing levelized-cost-of-energy (LCOE) analyses to incorporate lower normalized gas prices into long run break-even assumptions.
- Currently, there is no broad consensus on the outlook for natural gas supply and demand – two general perspectives exist at opposite sides of the pricing spectrum:
 1. Natural gas supply from newly tapped shale gas reserves and improvements in horizontal drilling productivity will keep prices low for the near-medium term future, particularly in the United States, where there is little structural demand growth.
 2. Challenges around geology, rising finding and development (F&D) costs and rapid depletion of new shale wells indicate that new supply will be more costly to develop at scale, and marginal costs will trend higher necessitating higher forward curves to stimulate incremental new supply.
- An important trend for investors to monitor is the decoupling between the oil price and the price of gas, as the two had been historically correlated and many gas contracts are indexed to oil. Going forward, the relative correlation between

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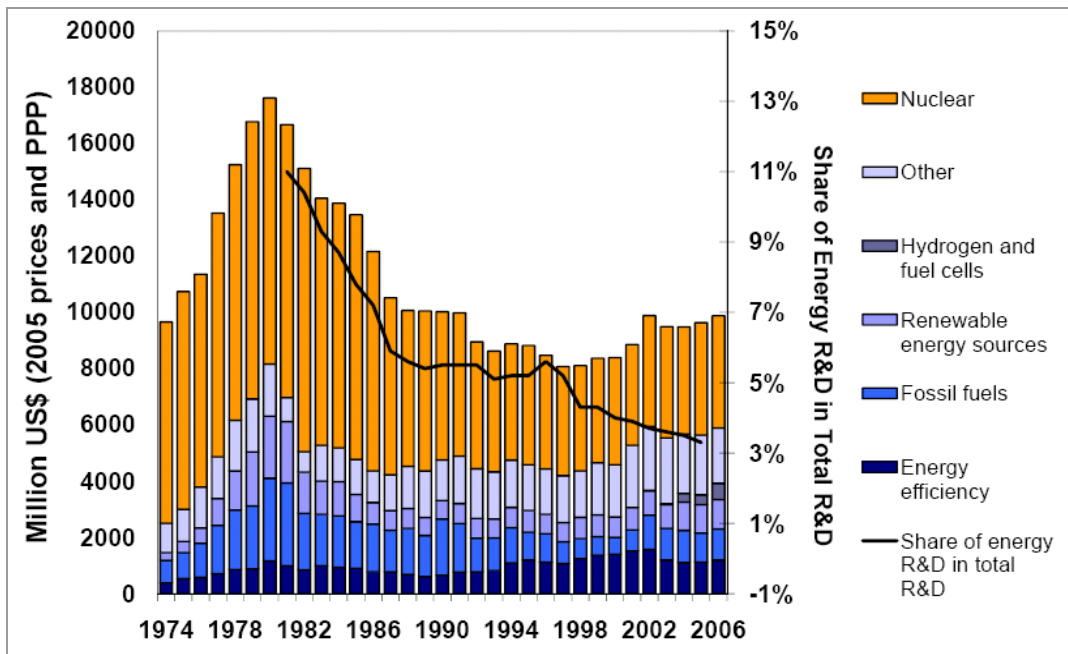
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climate change sectors and oil / gas will be an important metric to understand since historically the clean energy sector's relative price performance has been heavily correlated with fossil fuel prices.

- This is further complicated by coal prices which increased dramatically in 2007 and 2008 in the face of supply constraints but subsequently corrected. Coal has the largest reserve to production ratio of the three primary fossil fuels and is likely to challenge the LCOE break-even of cleaner fuels in the absence of a high carbon price.

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Low-carbon technology adoption can also be accelerated through the role of subsidies: As of now, fossil fuels are more heavily subsidized than renewable energy; but renewable subsidies are increasing.



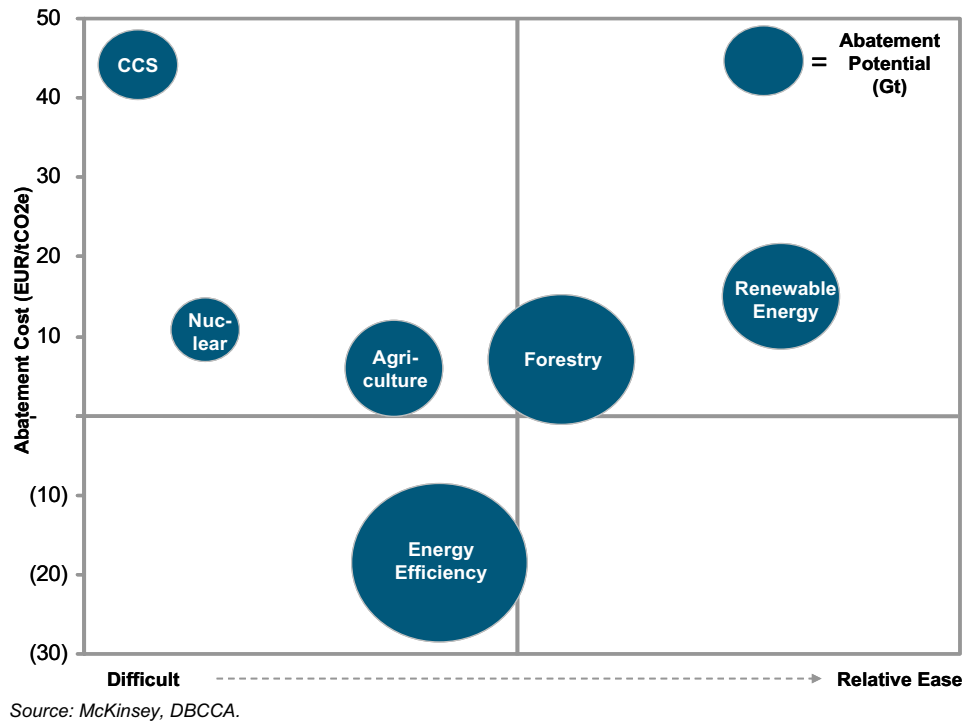
Source: International Energy Agency 2008

Traditional energy sectors have received large subsidies in the past, overwhelming subsidies to the renewable energy sector by a wide margin. While these subsidies have been large in the aggregate, on a ton of oil (TOE) or British Thermal Unit (Btu) equivalent basis fossil fuels subsidies are much lower than renewable energy, which reflects their dominance in the energy mix.

- We believe in evaluating the costs and benefits of energy policy, an area that requires further study and inclusion in analysis is the role of fossil fuel subsidies. The energy sector has traditionally received large subsidies across all generation types, with renewables and alternatives receiving a relatively small share.
- A common critique of clean energy sectors is that they are primarily supported by government subsidies or that they are uniquely dependent on such public sector funding.
- However, a 2008 study by the International Energy Agency shows that renewables and alternatives have traditionally occupied a relatively small share of total public subsidies.
- The net effect of subsidies is a distortion in the energy price to a below market reference level, which affects behavior and impacts wealth transfers between producer, consumer and governments. On the production side, subsidies are generally allocated to tax breaks, cash grants, or enshrined in regulation, protecting producers. On the consumption side, which is more common in developing markets, governments regulate fuel prices and sell them below market to consumers at a fixed price.
- In line with recent global government stimulus policies, we expect the pace of renewable subsidies to increase as part of complementary climate and energy policy, particularly in light of the favorable impact on jobs growth.

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All together, current government initiatives and the economic environment have led low carbon technologies to sit within the context of costs, adoptability and ultimately, their abatement potential.

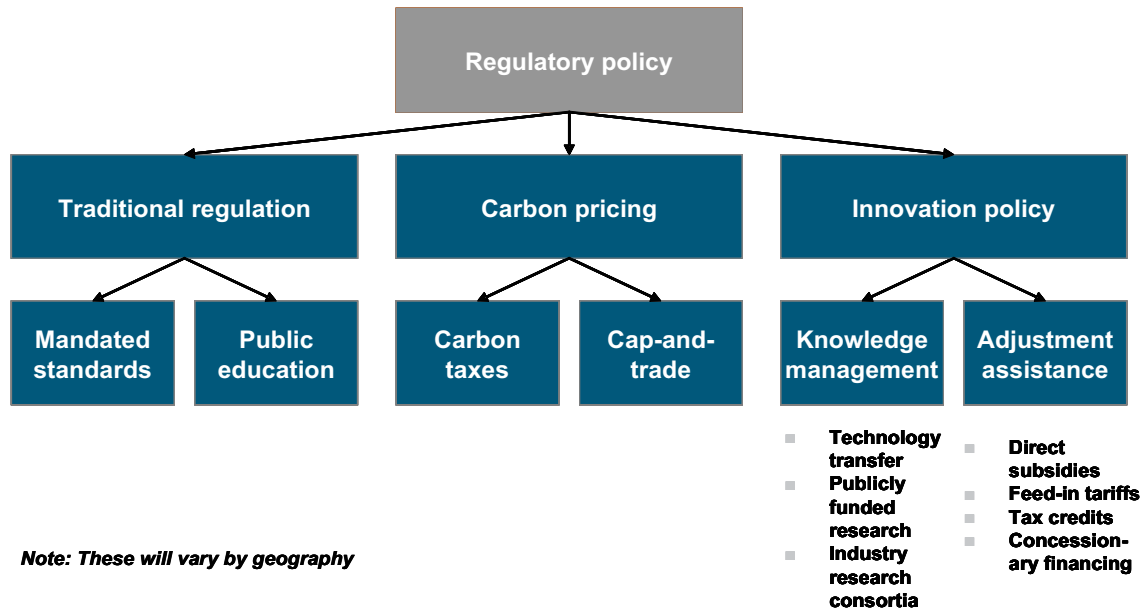


Clean technologies face different levels of deployment barriers. This chart shows the relative abatement potential and cost to deploy clean technologies at commercial scale plotted against the relative deployment barriers facing each. This again illustrates the need for government policy intervention

- Looking at the key areas that might deliver a substantial amount of mitigation potential we find that energy efficiency technologies are often the cheapest option and have the most mitigation potential; however, they are affected by behavior barriers that require mandates and standards to overcome.
- In many cases, incentive structures are not properly aligned, and there is a lack of market / policy structure in place to encourage scale-up.
- However, deployment is happening in renewable energy and forestry and we expect the pace to increase as technologies come down the learning curve and policy is enhanced.
- The deployment barriers for each technology are:
 - Renewable Energy: Needs incentives, but deploying at scale currently
 - Forestry: Lack of market / institutional / policy frameworks
 - Energy Efficiency: Needs incentives, principal-agent barrier, connected to building market
 - Agriculture: Slow uptake by farmers; Lack of market / institutional / policy frameworks
 - Nuclear Energy: Expensive, long lead times, public perception hurdles
 - CCS: Extremely early stage and expensive, risk of low long term gas prices

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Governments can utilize three broad policy levers to address these deployment barriers.



Source: DBCCA analysis, 2009.

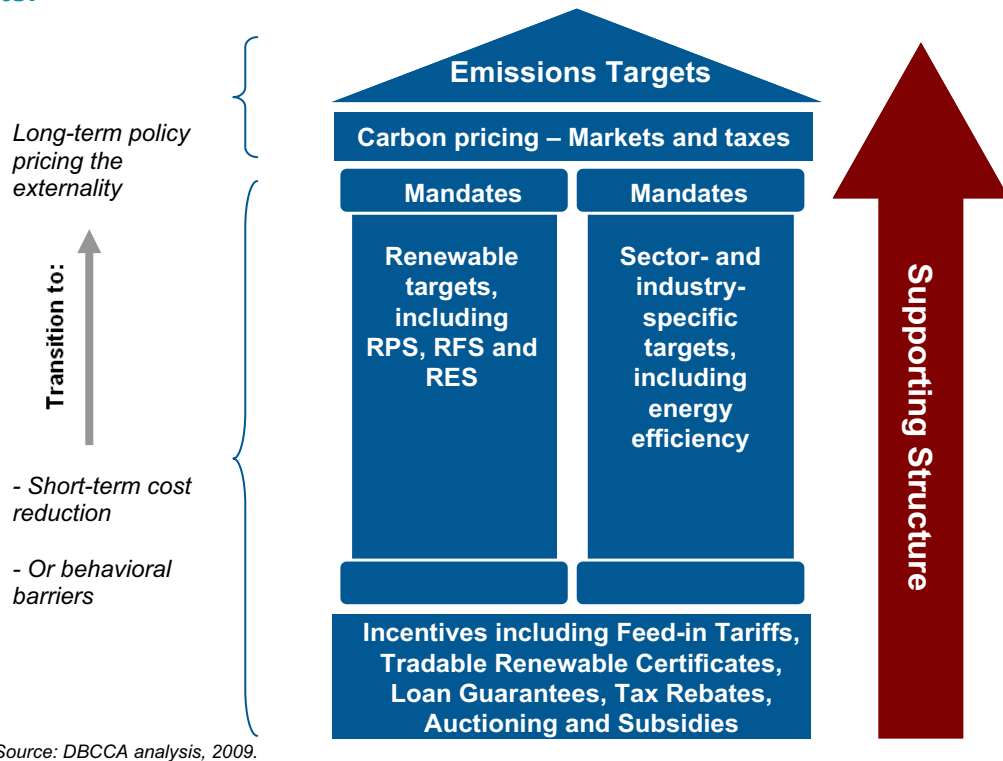
Regulatory policy remains the core to climate change investing and carbon mitigation. Policies are characterized by traditional regulation, carbon pricing and innovation policies. To date, the layering of traditional mandates and standards backed up by innovation policy incentives have been the key drivers for investors and will continue to be so for many years to come. We believe it will take a long time for carbon markets to become hedgeable and fungible.

Today, most climate change policy around the world is concentrated either in traditional regulation (renewable portfolio standards, biofuels mandates, efficiency standards, building codes and emissions standards) or in innovation policy (that is incentives such as feed-in tariffs, tax credits, direct subsidies and funding for research and development).

- Many mitigation opportunities, such as biofuels in the US or wind in Europe, are influenced both by traditional regulation and innovation policy.
- Carbon pricing is, as of yet, an emerging regulatory tool, given its still modest price, superimposed on the European regulatory system through the European Emissions Trading Scheme and the Kyoto Protocol Mechanisms.
- We believe that events in Copenhagen have placed more emphasis at the state and national level for now across all these policy areas, but particularly traditional and innovation policy.
- In general, investors look to maximize incentive capture from all available policies.

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An idealized view of the current policy regime is one of enabling relationships between various policy levers that enhance the effectiveness of emissions reduction targets.

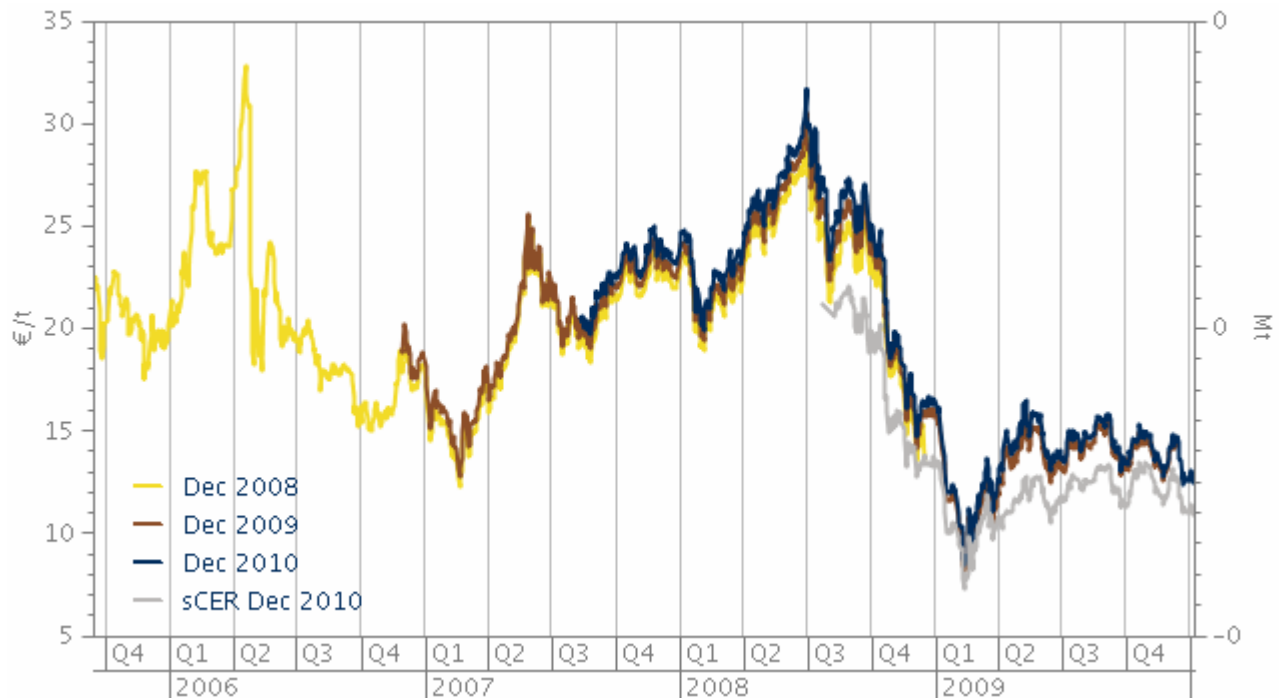


Climate policy structures exist in a hierarchical relationship, with support underpinning the ultimate goal of emissions reductions

- Another way of looking at the policy structure looks at the inter-relationships of the key policy drivers.
- Policy regimes contain a variety of interrelated elements. They are generally developed with a goal – or target – in mind. In the case of climate change, these targets aim to reduce emissions, increase the penetration of renewables, boost efficiency, or transform an industry or sector. In this study, we divide these targets into two sets:
 1. Emissions targets, which aim to reduce greenhouse gas emissions by a specified level by a set year. These targets can be supported by carbon pricing, either through carbon taxes or cap-and-trade regimes;
 2. Mandated renewable, industry and sector targets, which require a minimum proportion of renewables in the electric power mix, stipulate increased industrial efficiency, or mandate other actions.
- Underlying all of the targets are incentives that drive achievement. A great variety of incentive schemes are in place, ranging across feed-in tariffs, markets for tradable renewable energy certificates (RECs), reverse auctioning for renewable capacity, tax credits, loan guarantee schemes and government-backed funds.
- We believe that “policy momentum” will continue towards heightened mandates and incentives, with comprehensive and binding emissions targets more difficult for governments to pass during the economic downturn.

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Carbon pricing is also a key component; many policy regimes have begun to implement these.



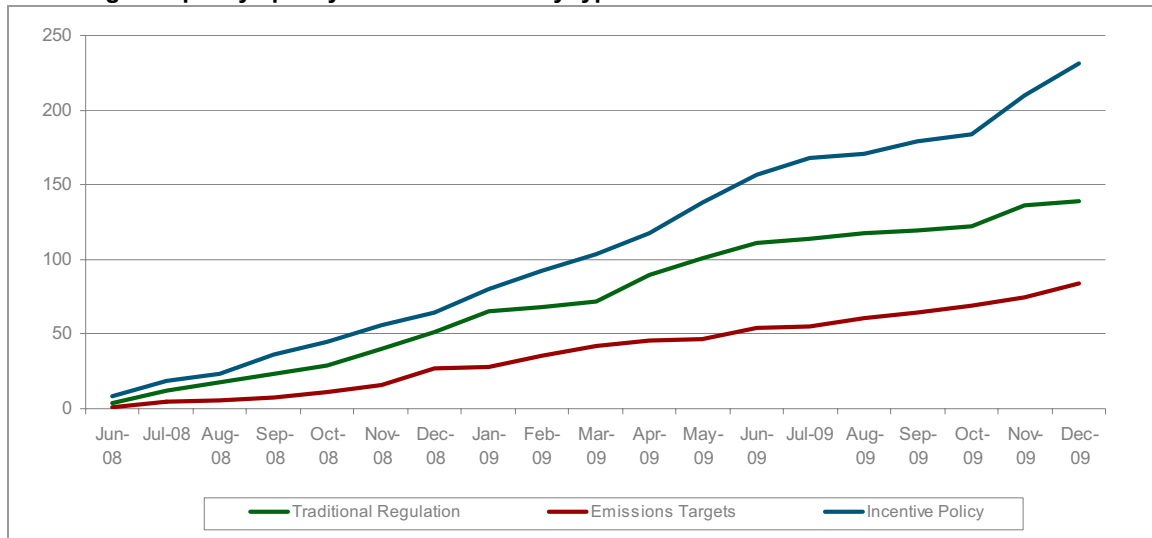
Source: Point Carbon, 2010.

- Carbon pricing is created by policy, and carbon policy is being implemented worldwide.
- The emerging policy framework has three tiers:
 - UN: Bali Summit committed world to achieving a Post-Kyoto deal by end 2009. However, a legally binding global deal was not reached at Copenhagen.
 - EU: Unilateral target to cut GHG emissions by 20% by 2020, and 30% within the context of a global deal. Much of the cuts will come from emissions regulated under the EU Emissions Trading Scheme.
- Other regional schemes are being discussed.
 - US House of Representatives has passed the American Clean Energy & Security Act (ACES) which proposes a carbon market starting in 2012.
 - US Senate committee has passed the Clean Energy Jobs and American Power Act.
 - Australia is moving towards a trading system under the Carbon Pollution Reduction Scheme (CPRS).
- Carbon prices in the EU have recently decreased primarily due to the economic crisis, which has negatively impacted many company financials and the ability to afford emissions reductions. Naturally, emissions have declined amidst the recent downturn, leading to a lesser “need” for covered entities to reduce them.

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Many of these global climate policy initiatives have increased substantially over the past year and a half.

Cumulative # of global policy / policy announcements by type



Source: DBCCA analysis, 2010.

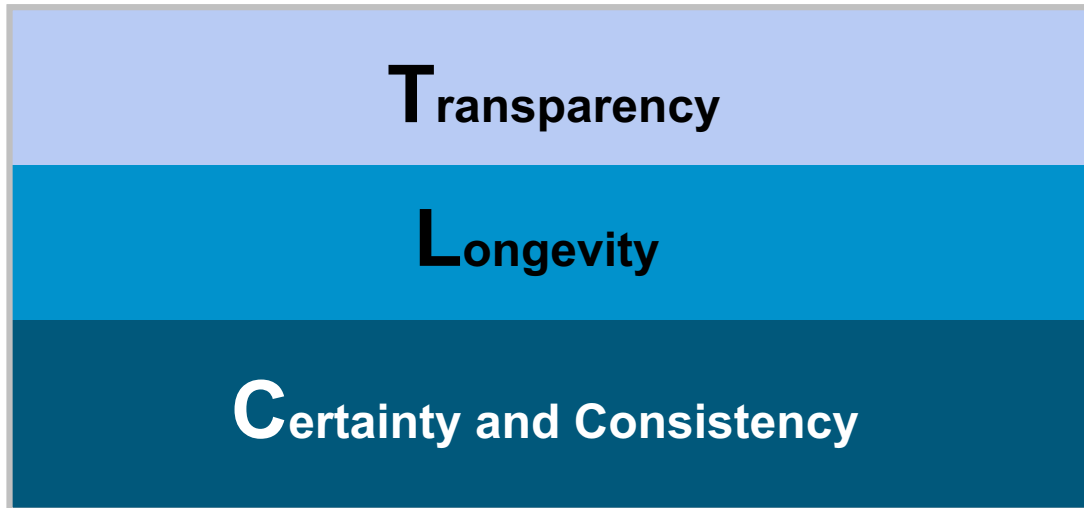
Governments worldwide have been announcing a large number of new policies related to climate change sectors over the past year and a half

- DBCCA tracks global policy targets and programs, and has classified them into three categories: traditional regulation, emissions targets, and incentive policies.
 - Traditional Regulation: Renewable portfolio standards
 - Emissions Targets: Explicit reduction goals
 - Incentive Policies: Subsidies and incentives providing support to technologies
- These policies are then mapped by date of announcement, and the cumulative total is plotted above.
- Investors can use this chart to understand the 'policy momentum' in the climate change space, noting that governments are increasing their commitment to supporting the sector.
- The amount of policy has grown rapidly over the past year and a half, with particular growth seen in incentive policies.
- Emissions targets have grown slowest, though this is to be expected, as they represent the highest level of climate change policy hierarchy and therefore have the broadest application.

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Government policy support also remains a key focus for investors. There are three key drivers that investors look for in policy.

In assessing the potential success of policies, these factors should be taken into account.



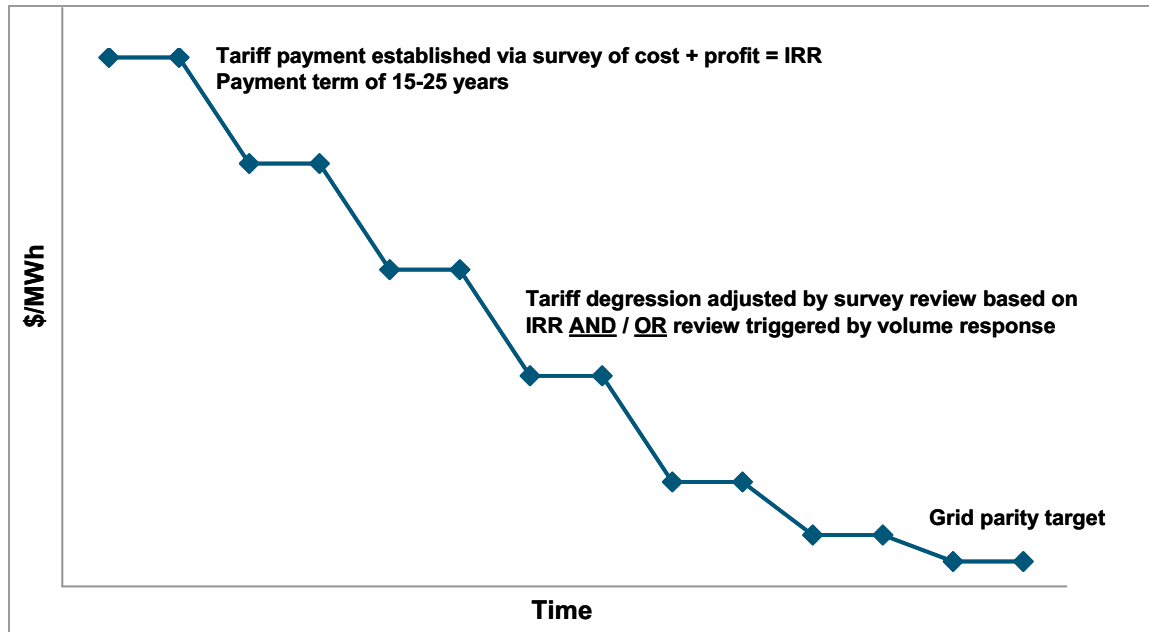
TLC: Transparency, Longevity and Certainty, drives investment. As investors, this has been our message to policy makers for much of 2009 and it applies in equal force in 2010.

- Our research has focused specifically on the mandates and incentives that can best complement the emerging carbon markets, which we believe hold the long term policy solution. Among the many policy options, feed-in tariffs (FiTs) with advanced price discovery features show significant potential for enabling scale deployment of renewable energy and creating jobs. With governments announcing more targets at Copenhagen, delivering on these through complementary policies on the ground right now is ever more important.
- We then set out what we consider to be the most advanced features of FiTs that can stimulate investment on a large scale while containing costs and maintaining TLC. A critical feature of a successful FiT regime is periodic reviews, conducted in a transparent manner, of its progress and effectiveness. Such reviews are used to respond to changing market conditions in renewable technologies so that a fair return is established for investors. The recently announced review of solar tariffs by the German government is an example.
- Our green paper on renewable energy policy* sets out our view of the optimal features of an advanced FiT. Germany remains a leading example, and in North America, the province of Ontario has emerged with a particularly strong policy. We regard these policies as applicable at a country, province, state or city level, anywhere in the world.

* *Paying for Renewable Energy: TLC at the Right Price (December 2009)*

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The feed-in tariff is a preferred means of incentivizing the growth of clean energy, offering 'TLC' to investors.



Source: DBCCA analysis, 2009.

A feed-in tariff should support a mandated renewable energy target by creating investor TLC with a pathway subject to transparent price discovery as it reaches grid parity.

- As set out in our recent paper looking at the scale-up of renewable energy in Germany there is strong evidence that renewable energy targets can be met through a strong volume response incentivized by Feed in Tariffs (FiTs). We further expanded upon the effectiveness of the volume response in our Climate Tracker and contrasted some of the key elements of a FiT with a more “market based” Renewable Energy Certificate (REC) approach.
- We examined FiTs in France, Germany, Netherlands, Ontario, and Spain.² While not the focus of our paper, we are also interested in studying the latest thinking in FiTs that are either in discussion or being proposed. The UK, US, India and China all have proposals on the table, although we did not address these in our report.
- The core elements of any FiT are:
 1. Defined eligible technologies;
 2. Tariff pricing differentiated by technology;
 3. A standard offer (frequently expressed through a contract), for a guaranteed payment for renewable electricity generation;
 4. A guaranteed interconnection for all renewable generators and;
 5. Payments over a long timeframe.

² DBCCA, “Paying for Renewable Energy: TLC at the Right Price-Achieving Scale Through Efficient Policy Design,” December 2009.

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The following outlines the key aspects of an advanced feed-in tariff (FiT) design.

FIT Design Features	Key Factors	TLC at the Right Price	France	Germany	Netherlands	Ontario	Spain
Policy & Economic Framework	"Linkage" to mandates & targets	Yes	23% by 2020	30% by 2020	20% by 2020	Halt coal use by 2014	20% by 2020
Core Elements	Eligible technologies	All renewables eligible	Wind, Solar, Geo, Small hydro, Bio-mass, Biogas	Wind, Solar, Geo, Small hydro, Bio-mass, Biogas	Wind, Solar, Biomass, Biogas, CHP	Wind, Solar, Hydro, Biomass, Biogas	Wind, Solar (PV & CSP), Geo, Small hydro, Bio-mass, Biogas
	Specified tariff by tech	Yes	Yes	Yes	Yes	Yes	Yes
	Standard offer/ guaranteed payment	Yes	Yes	Yes	Yes	Yes	Yes
	Interconnection	Yes	Yes	Yes	Yes	Yes	Yes
	Payment term	15-25yrs	15-20yrs	20yrs	15yrs	20yrs	15-25yrs
Supply & Demand	Must take	Yes	No	Yes	No	Yes	Yes
	Who operates (most common)	Open to all	IPPs; communities; utilities	IPPs; communities; utilities	IPPs; communities	IPPs; communities	IPPs; communities; utilities
Fixed Structure & Adjustment							
How to set price	Fixed vs. variable price	Fixed	Fixed	Fixed	Hybrid	Fixed	Both
	Generation cost vs. avoided cost	Generation	Generation	Generation	Generation	Generation	Generation
	IRR target	Yes	8%	5-7%	No	11%	7-10%
How to adjust price	Degression	Yes	Wind only	Yes	No	No	No
	Periodic review	Yes	No	Yes	Yes	Yes	Yes
	Grid parity target	Yes	No	Yes	No	No	No
Caps	Project size cap	Depends on context	Varies	No	Yes	PV only	Yes
Policy interactions	Eligible for other incentives	Yes - eligible to take choice	Yes	Yes	Yes	Yes	Yes
Streamlining	Transaction costs minimized	Yes	Yes	Yes	No	Yes	No

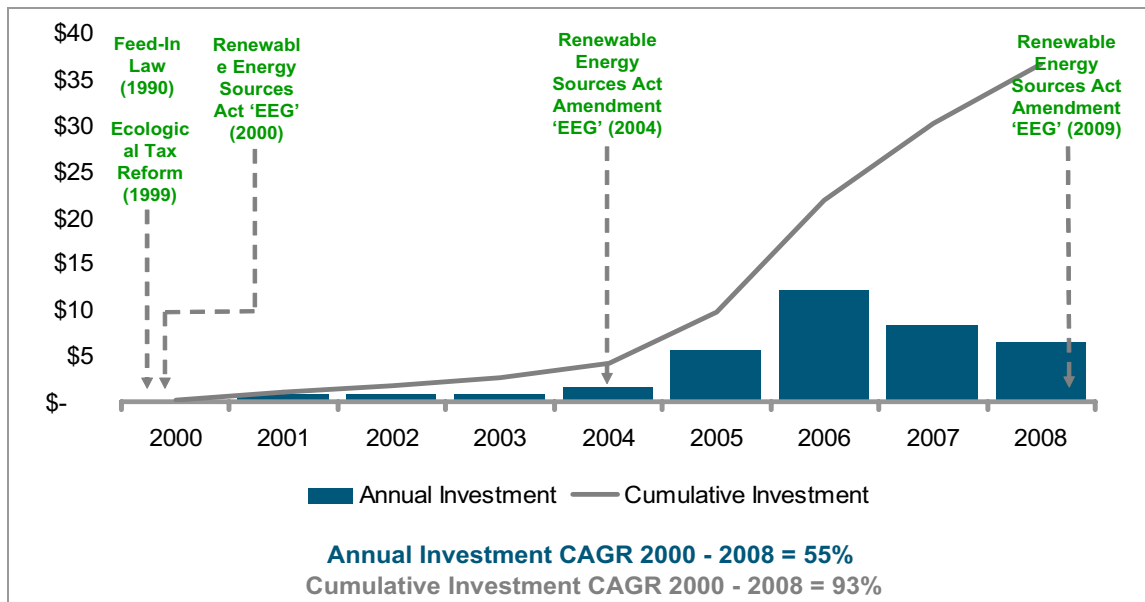
Source: DBCCA analysis, 2009.

Scale-up of renewable energy can satisfy many policy/economic goals including: emissions targets, energy security and job creation in the green sector. Policy makers at the state and local level are beginning to take notice of how successful advanced FiT regimes can be in achieving a significant net economic benefit.

- Renewable energy incentives can be integrated into carbon markets and play the role of a Research, Development and Demonstration (RD&D) incentive while proven technologies are in their "learning" phase.
- Investors want Transparency, Longevity and Certainty – "TLC" in order to deploy capital. There needs to be a transparent process that gives a reasonably certain rate of return over a long timeframe. This should reduce the cost of capital. However, public support is required for this to endure, so cost and price effectiveness are crucial.
- Given the challenges of developing more stable and transparent renewable energy credit (REC) markets, in our view, the best features of advanced FiTs can be integrated into the REC market via establishing a floor price which is also subject to advanced price discovery features. Standardizing the renewable energy contract then completes transparency. This can become the basis for constructing power purchase agreements (PPAs) in the US. PPAs should continue to reflect all other incentive features of the US policy scheme as they are set. This would add a crucial level of TLC for investors and enable renewable energy scale-up. Given the complexity of the US regulatory landscape, many believe this works best at the state level.
- In many respects, at the core of our thesis is the analysis of what we term "advanced" FiT policy design. In the chart above, we have extracted what we consider to be the key features we would recommend to be included in a FiT, tracked against the key regimes we have examined. It is these features that we believe can deliver TLC at the right price.

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The German example of policy, particularly via feed-in tariffs, driving job growth and investment provides a leading model for clean energy scale-up.



Note: Investment figures are based on New Energy Finance's PE/VC, Asset Financing and Public Markets database, which comprises of disclosed investment amounts. This may not accurately represent all investments made in the renewable energy sector during this time period. Market cap data is sourced from Bloomberg, 2009.

Led by feed-in tariffs, renewable energy markets in Germany have developed into a robust industry, as indicated by the rate of growth in capital investment and public equity markets. Investment in Germany's clean energy sector as a percentage of its GDP is approximately 2-3 times greater than that in the US .

This robust industry growth has in turn led to an increase in jobs. Germany is a global leader in wind and solar job creation, and in fact, according to data released by the United Nations Environment Program in 2006, Germany had 8 times as many wind and solar jobs on a per-capita basis when compared to the US. In Germany's case, the main policy driver behind its renewable energy sector has been the feed-in tariff, which provides certainty of long-term cash flow to projects. The German Government has also set clear targets for the future:

1. Reduce GHGs by 40% from 1990 levels by 2020.
2. Energy productivity must grow by 3% per annum, meaning that in 2020, Germany must be twice as energy efficient as it was in 1990.
3. The proportion of renewable energy must steadily increase: to 50% of primary energy consumption by 2050; from about 9% of final energy consumption today to 18% by 2020; from about 15% of gross power consumption now to at least 30% by 2020; from about 7% of today's thermal energy requirement to 14% by 2020.
4. The contribution made by biofuels is to increase by 2020 so as to permit a 7% reduction in greenhouse gas emissions compared to using fossil fuels.
5. The contribution of Combined Heat & Power (CHP) to power generation is to double to 25% by 2020.

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While the German case study offers insight on the impact of government policy, climate change policy regimes vary substantially around the world, and often need to be assessed within their own context.

DBCCA collected information on approximately 270 climate change targets covering 109 countries, states and provinces – both greenhouse gas emissions targets and renewable, industry and sector mandates.

- Emissions targets aim to reduce greenhouse gas emissions by a specified level by a set year. These targets can be supported by carbon pricing, either through carbon taxes or cap-and-trade regimes;
- Mandated renewable, industry and sector targets require a minimum proportion of renewables in the fuel pool or electric power mix, stipulate increased industrial efficiency, or mandate other actions, such as reduced deforestation or the phase-out of inefficient appliances. We have not at this time modeled detailed building efficiency codes, which are extremely fragmented and localized.

Working with the Columbia Climate Center at the Earth Institute, Columbia University, the “Climate Tracker” is the first publicly-available analysis of its kind. It incorporates results of a model prepared by Columbia Climate Center researchers that estimates the impacts on carbon emissions of each of the 270 major climate policies, and aggregates them at country, regional and global levels.

When looking at Mandates, we made the following investor policy framework assessment:

	Status		
	3: Higher Risk	2: Moderate Risk	1: Lower Risk
Incentives including: <ul style="list-style-type: none"> • Feed-in Tariffs • RECs/ROCs • Loan guarantees • Tax rebates • Auctioning • Subsidies • Net metering (Rated against 5 sub-criteria)	The timeframe of the policy is short-term or highly uncertain	The timeframe of the policy is medium-term and open to change	The timeframe of the policy is long-term and stable
	The enabling policy is poorly aligned with the overall target	The enabling policy is partially aligned with the overall target	The enabling policy is well aligned with the overall target
	Current market conditions substantially compromise policy effectiveness	Current market conditions may sometimes compromise policy effectiveness	The policy can be effective in the current market conditions
	Policy is extremely complex or bureaucratic, creating significant barriers to investment for all but local experts	Policy is somewhat complex or bureaucratic, creating some barriers to outside investment	Policy is accessible to outside investors
	The policy is unlikely to unlock private capital	The policy may unlock some private capital	The policy will unlock substantial private capital
Public Financing	Public financing is required but not available	Public financing is available but more may be required to achieve target	Adequate public financing is in place or is not needed
Enforcement	There are no penalties for non-compliance, or penalties are unlikely to be enforced	Penalties for non-compliance exist, but may be insufficient or sporadically enforced	Robust penalties are in place to ensure full compliance, and they are likely to be enforced
Monitoring	Monitoring mechanisms have not been identified, or are not robust	Monitoring is carried out, but may be infrequent or ad hoc	Robust monitoring is regularly carried out
Sovereign Credit Risk	Credit risk rating is non-investment grade, falling between CC and NR according to S&P or below Caa1 according to Moody's	Credit risk rating falls between BB and CCC according to S&P or between Ba1 and B3 according to Moody's	Credit risk rating is investment grade, falling between AAA and BBB according to S&P or between Aaa and Baa3 according to Moody's
Integrated Plan	No plan to achieve target is in place, or plan is unrealistic	Plan to achieve target is in place but lacks detail, or plan is in development	Detailed plan to achieve target is in place
Implementation Capacity	No team or committee has been assigned responsibility for implementation, or arrangements are unclear	A team or committee has been assigned responsibility for implementation, but it may be under-resourced or responsibilities may be poorly articulated	A well-resourced team or committee has been assigned responsibility for implementation
Historical Achievement	There is a history of falling short of targets	There is a history of meeting some targets	There is a history of meeting most targets
Overall risk assessment	Determined by totaling up the individual ratings		

DBCCA has developed a means of assessing the risk to investors of mandated targets for on-the-ground policies based on their policy effectiveness.

- We have developed a robust, qualitative assessment framework to rate each target, which is in turn fed into a quantitative risk rating score. Each target is assessed against 8 key criteria, which are then used collectively to develop a composite risk rating. As already discussed, incentives are particularly important. Given their importance, we use five sub-criteria to assess them.

Continued on next page.

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- While these evaluations are qualitative in nature, we have attempted to be as methodical as possible in our assessment. The rationale for ratings across the 8 key criteria we examine is set out in the table above.
- In the overall assessment, each of the criteria has been given equal weighting. This results in a composite score of between 8 and 24 points, with lower scores indicating a relatively lower-risk policy environment:
 - For all targets with a score of 12 points or less, the composite score is 1 – lower risk;
 - For all targets with a score of between 13 and 20, the composite score is 2 – moderate risk;
 - And for all targets with a score of 21 and above, the composite score is 3 – higher risk.

Overall, we concluded with the following country-specific risk assessment (based on mandates and emissions targets) and their corresponding capital flows.

MEF Country	Overall Risk Assessment (1 = lower risk, 2 = moderate risk, 3 = higher risk)	Cap Inv 2000 - 2008 (\$ m)	GDP 2008 (2008 \$ bn)
Australia	1	5,427	800
Brazil	1	14,445	1,993
China	1	41,196	7,973
France	1	6,645	2,128
Germany	1	36,611	2,918
Japan	1	888	4,329
Canada	2	8,101	1,300
India	2	7,446	3,297
Indonesia	2	308	915
Mexico	2	135	1,563
Russia	2	113	2,266
South Africa	2	211	491
South Korea	2	1,916	1,335
United Kingdom	2	17,119	2,226
United States	2	52,120	14,260
Italy	3	6,421	1,823

Source: DBCCA analysis, 2009. Capital investment from New Energy Finance Industry Intelligence Database, 2009. Data only includes disclosed data, and may not fully encompass all deals. Data includes the following: (1) The figures include VC/PE for company deals, PE - Buy-out deals, but excludes PE for projects; (2) New build Asset Financing in clean energy (wind, biofuels, biomass, geothermal, mini-hydro, marine, & solar projects only). The figures exclude re-financing and project acquisition deals, bridge/construction type financing, and small scale projects; (3) Includes public market investment in clean energy. Private Investment in Public Equity (PIPE), and Over-the-Counter (OTC) deals are included. GDP data sourced from CIA World Factbook, 2009.

DB Climate Change Advisors has collected information on approximately 270 climate change targets – both greenhouse gas (GHG) emissions targets and renewable, industry and sector mandates. From this database we have:

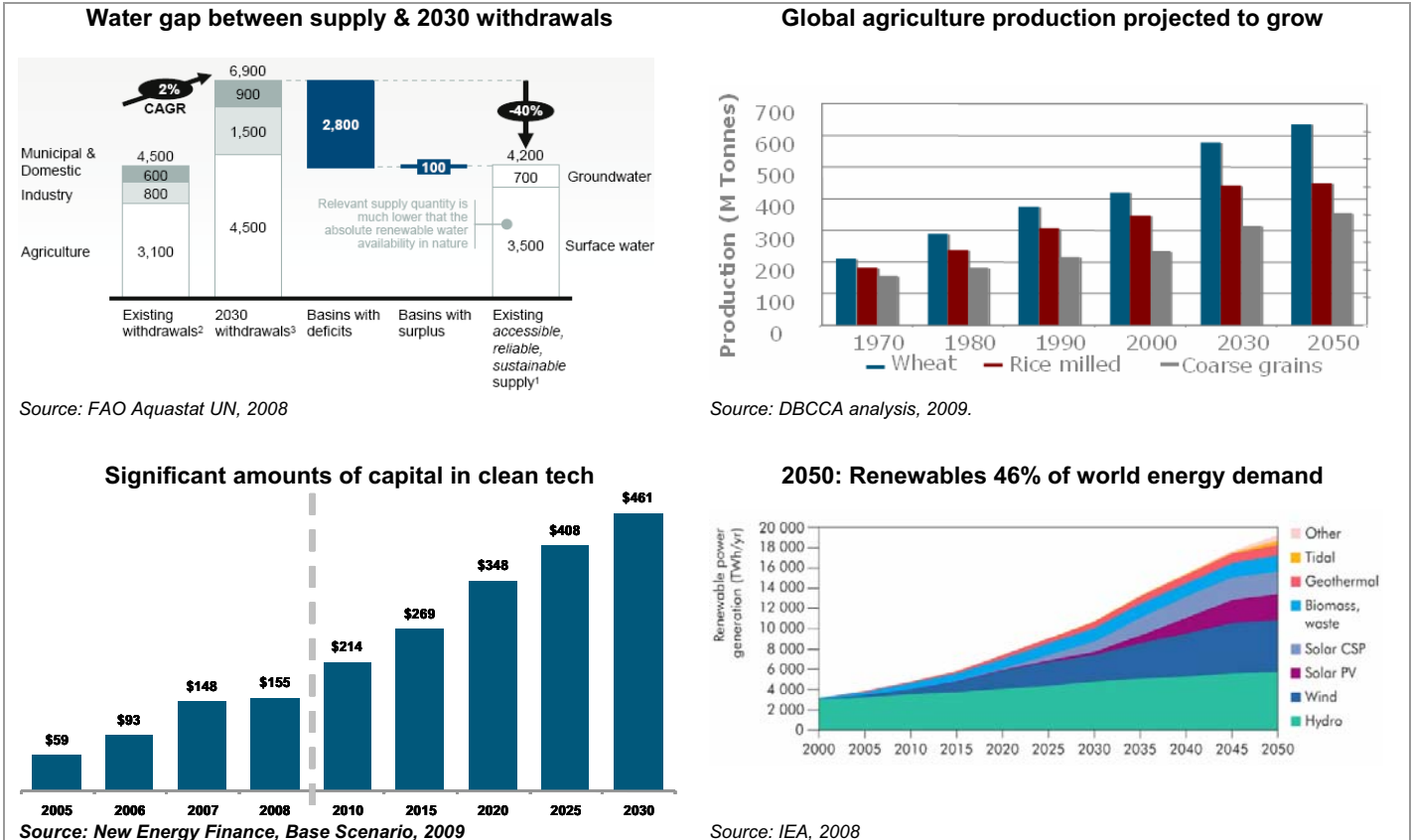
1. Analyzed each mandated target to assess its risk level and ability to deliver its goal;
2. Developed an investor risk assessment of country policy regimes by aggregating these individual mandates;
3. Modeled the impact of all the targets on emissions through 2020. The modeling was conducted by researchers at the Columbia Climate Center at Columbia University's Earth Institute
 - We focused in this study on the Major Economies Forum (MEF) on Energy and Climate Change countries, which account for over 75% of global GHG emissions today. By 2020, on a BAU pathway the US, EU and China between them account for over half of global emissions.
 - Among the MEF countries, China, Germany, France and Australia all have lower risk profiles for climate change investments. This is because they have strong incentives in place, along with a consistent approach, shown through well-considered plans.
 - Notably, the US, UK and Canada are moderate risk as they rely on a more volatile market incentive approach and in the case of the US, have suffered from a stop-start approach in some areas, such as the production tax credit (PTC). However, when we correlate our ratings against actual capital flows over the past decade, these countries have been strong in absolute dollar terms. This reflects in the large size of their capital and energy markets overall, and in the US and Canada the existence of encouraging state level opportunities such as renewable portfolio standards (RPS), which require that a certain level of renewable energy be deployed over time.

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III. Market Sizing of Climate Change Sectors

Climate change-related end markets encompass a range of sectors, providing a rich and diverse investment opportunity.



Source: FAO Aquastat UN, 2008

Source: DBCCA analysis, 2009.

Source: New Energy Finance, Base Scenario, 2009

Source: IEA, 2008

Global demand for climate change sectors is increasing rapidly and results in large and robust end-markets.

- The demographic shifts currently underway will drive enhanced consumption of resources globally. Therefore, constraints on natural resources such as water and agriculture will drive the need for greater investment and policy support.
- Global water use will increase sharply, as both population and development require more clean water to be available across a broad set of geographies. According to McKinsey & Co., global water requirements could grow from 4,500 billion m³ today to 6,900 billion m³, representing a 40% increase from current accessible supply.
- Furthermore, nearly 70% of water withdrawals and 86% of water consumption are to due to agricultural demands. The population boom and higher global GDP per capita will require greater agricultural production by 2050, resulting in the significant production gap. According to the FAO, in order to feed a population of more than 9 billion and free the world from hunger, global food production must nearly double by 2050.
- As a result of global response to the need to decarbonize our economy, the demand for renewable and low-carbon energy production will increase as well. According to the IEA's World Energy Outlook 2009, higher fossil-fuel prices and increasing concerns over energy security and climate change, may potentially increase the share of renewables-based electricity generation from 18% in 2007 to 22% in 2030.
- All of these trends result in the potential for large, multi-billion dollar end markets. New Energy Finance estimates that by 2030, approximately \$500 billion of annual investment could be reached.
- The economic downturn may temporarily slow some of the demand, but it will not halt the long-run trends.

III. Market Sizing of Climate Change Sectors

It is important for investors to evaluate the abatement potential and capital expenditures within individual sectors and technologies.

	Abatement Gigatons CO2		Incremental Capex (\$ 2008 bn)	
	2020E	2030E	2010-2020E	2020-2030E
Efficiency	2.5	7.9	\$1,999	\$5,586
Renewables	0.7	2.7	\$527	\$2,260
Biofuels	0.1	0.4	\$27	\$378
Nuclear	0.5	1.4	\$125	\$491
CCS	0.1	1.4	\$56	\$646
Total	3.85	13.84	\$2,734	\$9,361

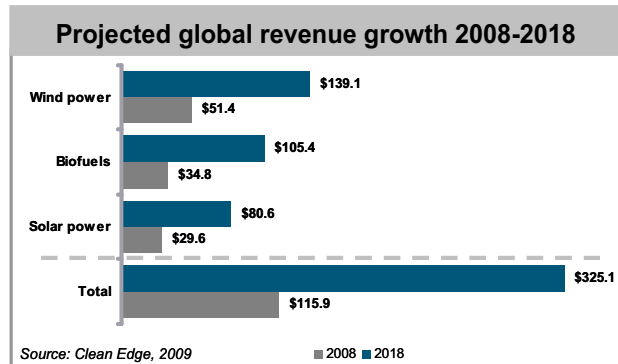
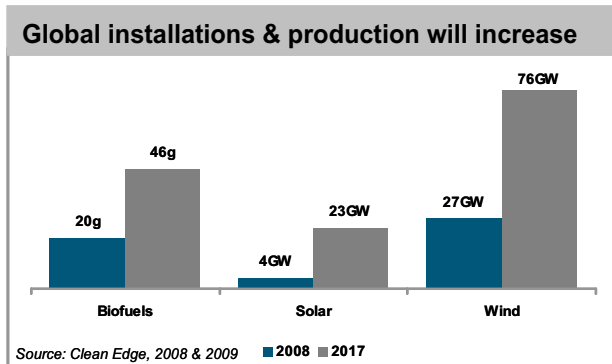
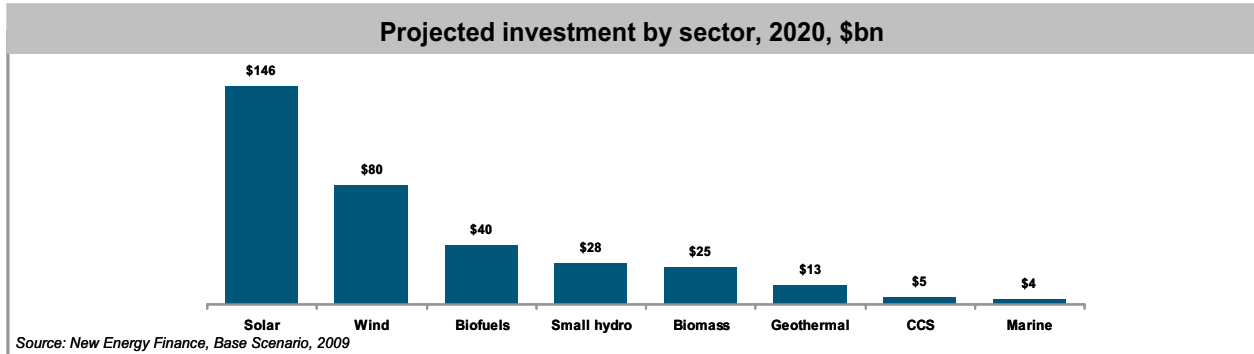
Source: *How the Energy Sector Can Deliver on a Climate Agreement in Copenhagen: Special early excerpt of the World Energy Outlook 2009 for the Bangkok UNFCCC meeting*; © OECD/IEA, 2009.

The CO2 abatement potential of different technology sectors is important to consider – as one of the end-results or goal of climate change investment should be abatement, while the scale-up of technologies is the means to get there.

- The scale-up of green technologies will require large additional capital expenditures in order to achieve the necessary level to abate CO2 and stabilize global temperatures. According to the IEA, the additional incremental cumulative capital expenditures required for achieving the 450 – Scenario would result in \$2,734 billion being spent between 2010 and 2020 and \$9,361 billion between 2021 and 2030. This represents an investment opportunity and points to the job creation and growth side of what is often thought of as a “cost.”
- Total abatement potential varies by technology sector. The capex investment amounts are presented as incremental, or in other words, over and above the IEA’s defined BAU levels during those years. Therefore, the actual amount of dollars spent on these sectors will be much higher. This represents a significant window of opportunity for investors.
- Energy efficiency is the clear dominant player, with 7.9Gt of CO2 abatement potential by 2030. In the IEA’s analysis, they believe that energy efficiency can offer up to 60% of the solution in 2020, both at power plants and in end-use, in order to achieve their 450ppm pathway scenario. Technologies are often well understood and developed but barriers to deployment need effective policy response.
- Renewable energy achieves the second largest long-run potential abatement, with 2.7Gt of CO2 abatement potential by 2030. Overall, policy regimes around the world are supporting the aim for faster deployment of such low-carbon technologies, urging greater investment and development of these technologies.
- Investors use these relative abatement and capex totals as an indicator of the long-run market size of these various sectors, and can assess the maturity of these technologies based on these factors. In doing so, investors can then evaluate how their own individual goals align with these market segments.
- Investors will find that some technologies, such as energy efficiency and renewables, are “investable” while others, such as CCS, are not yet fully investable, requiring significant amounts of R&D.

III. Market Sizing of Climate Change Sectors

Many sectors are poised for significant growth.



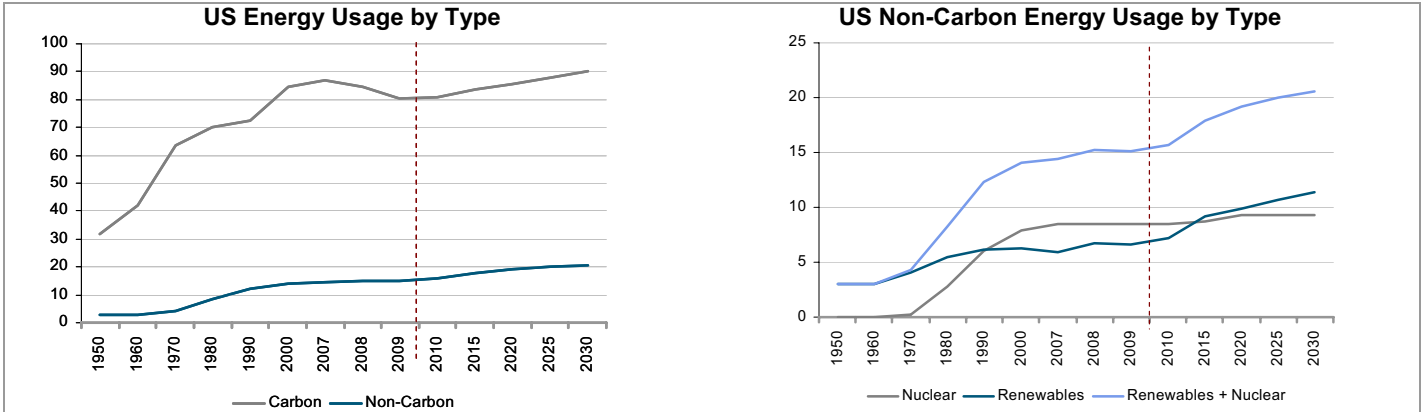
The clean energy growth trend can be seen across a number of metrics, as investors pursue opportunities to scale-up low-carbon energy sectors.

Investors can assess the growth or maturity of sectors by three main pieces of criteria: Investment, Installation capacity and revenue:

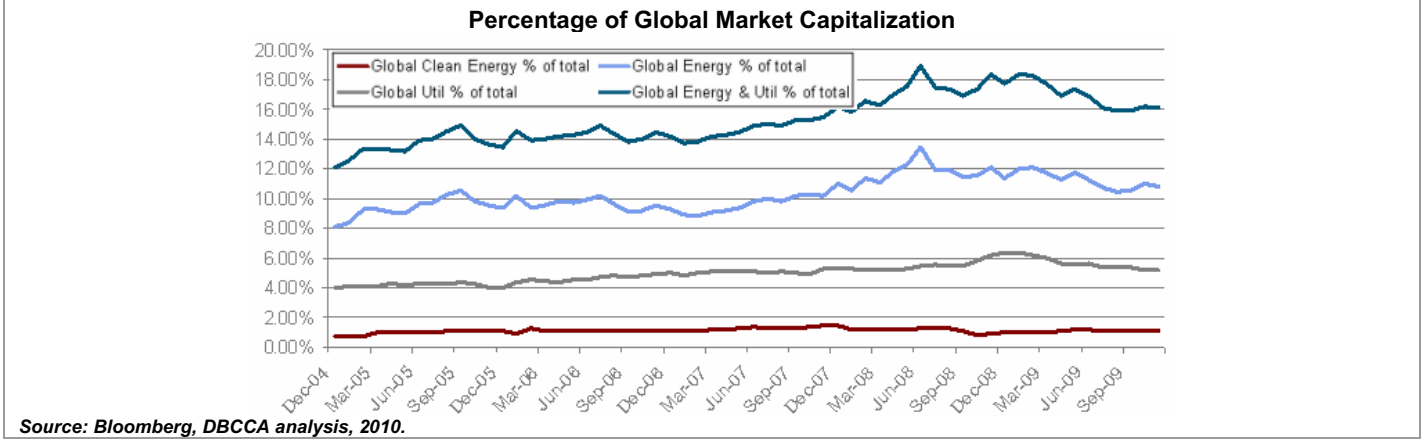
- Investment – large amounts of capital investment have been seen across different underlying clean energy sectors. This is expected to grow to 2020, with projected investment reaching more than \$300 billion. Solar leads this group with \$146 billion projected, followed closely by wind at \$80 billion. Furthermore, as stated earlier, New Energy Finance estimates that by 2030, approximately \$500 billion of annual investment could be reached.
- Installation – increased investment will further drive global installed clean energy capacity, with the wind sector still leading the pack, although solar will increase more rapidly relative to its existing base.
- Revenue – global revenue for solar photovoltaics, wind power, and biofuels expanded from \$75.8 billion in 2007 to \$115.9 billion in 2008, and is expected to increase to \$325 billion by 2018, according to Clean Edge. The chart above does not show fast growing areas such as energy efficiency, smart grid, and battery technology. Wind and solar are projected to grow at ~10.5% CAGR, while biofuels are projected to grow at ~11.7% over the time period. According to Clean Edge, for the first time, one sector alone, wind, had revenues exceeding \$50 billion.

III. Market Sizing of Climate Change Sectors

Many experts project that deployment of low carbon technologies will increase over the next 20 years.



Source: US EIA, Annual Energy Outlook 2010 Early Release



Source: Bloomberg, DBCCA analysis, 2010.

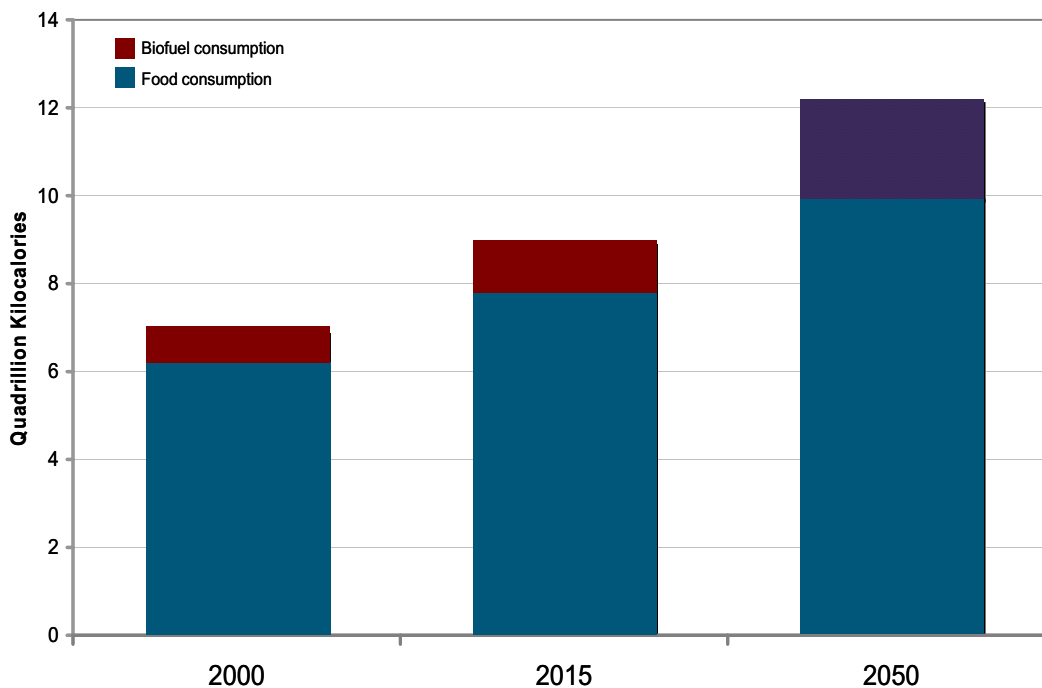
The shift to low-carbon energy production will have a large impact on the corresponding market capitalization of related energy companies, with a move expected over time between the relative market share of low-carbon energy companies and traditional producers. This represents the shift from an economic standpoint.

- In order to avoid the negative effects of climate change, the world's energy resources will need to shift from a carbon-intensive supply base to a low-carbon alternative.
- The beginning of this fuel switch is already visible in the trends visible among energy supply data. In the United States, the Energy Information Administration projects that the contribution of non-carbon sources (renewables, biofuels and nuclear) towards overall energy consumption will experience a 2% CAGR from 2009 through 2030.
- From 1980 through 2006, the percentage of low-carbon energy sources (including renewables, hydro and biomass & waste) has grown from 15% in 1980 to almost 20% in 2006.
- Driven by accelerated government policy, energy security and increased demand, fuel-switching will directly affect publicly-traded energy and power companies, in both traditional and clean energy sectors. Looking back through 2004, one can see that the market capitalization of traditional utilities and energy companies reached a peak in 2008 and has since experienced a decline (partially due to the economic downturn); while the market cap of clean energy companies has remained relatively steady. Investors should also note that at a market cap level, clean energy companies already make up more than 1% of global public equity market capitalization.
- The shift in fuel supply will result in broad success for the clean energy sector, or a major move by traditional companies into clean energy technologies. As a result, investors should position themselves to take advantage of this shift before the market prices it into estimates.

III. Market Sizing of Climate Change Sectors

In addition to low carbon technologies, the agriculture sector also requires additional support and investment.

Agricultural production and the predicted amount of calories needed in 2050



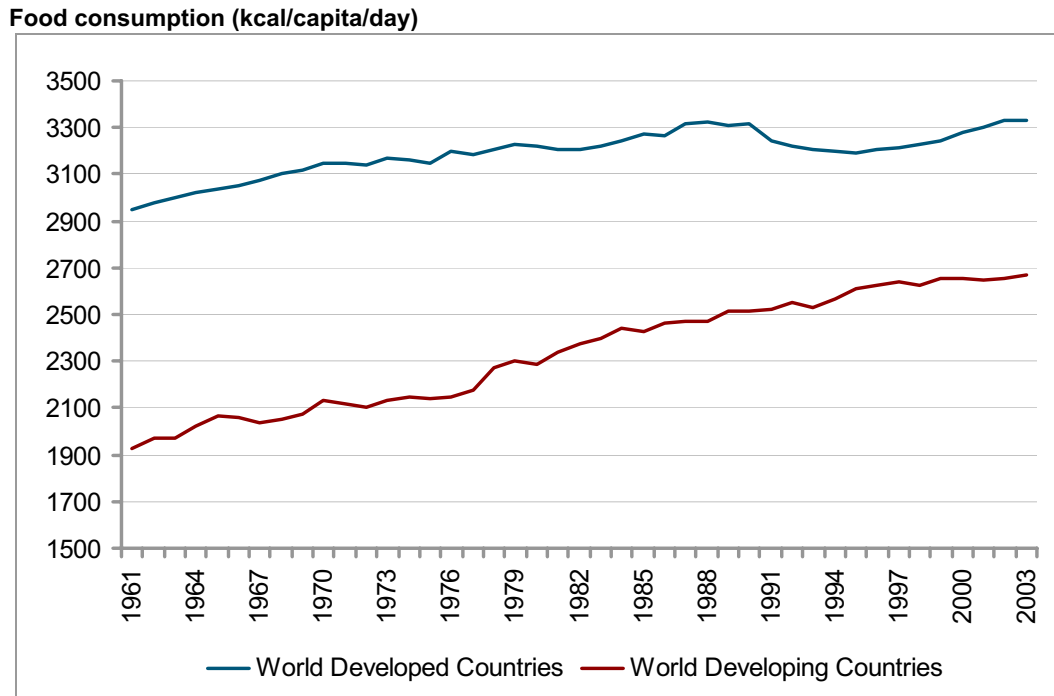
Source: DBCCA analysis, 2009

Climate change will affect agriculture, leading to a variety of investment opportunities as the world tries to sustainably close the production gap between existing and required resources.

- In the face of growing population, increasing prosperity, and climate change, the global agricultural system must modernize and fully integrate the production of food, feed and fuels.
- Demographics and climate change also drive the energy and transport sectors, and overall many commodity prices are expected to rise again. Potentially at odds, our agricultural and biofuel industries must not compete for land. We must raise the productivity of our lands such that all uses can flourish.
- It is the intelligent reallocation of our land to different uses that will allow our supply of agricultural production to both feed and fuel our populations. That reallocation must be predicated on detailed analysis of current land use, the capacity of given lands under certain constraints, such as water, fertility, and climate and sustainable land use policies.
- While technologies, management, and certain practices are proven to raise yields, they are poorly deployed. A lack of investment, misguided agricultural policies and subsidies, and lack of farmer education, training, and adoption has led to low agricultural productivity in much of the world.

III. Market Sizing of Climate Change Sectors

Food consumption has increased more rapidly in developing countries, as a result of the increased 'wealth' effect due increasing GDP per capita.



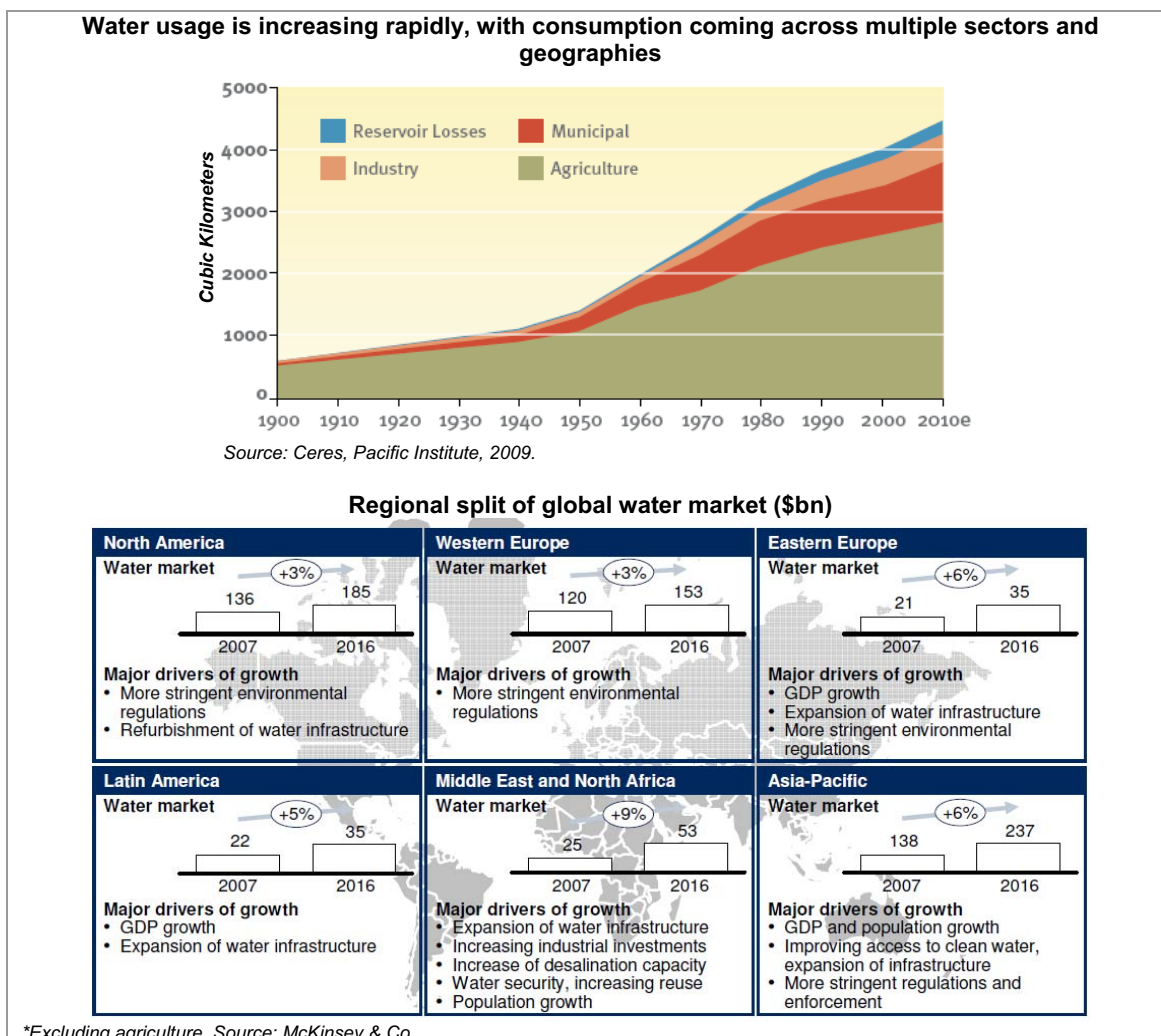
Source: FAOstat

Several key factors influence aggregate demand for agricultural products, which is growing rapidly, particularly in developing countries.

- The last few decades have seen unprecedented population growth, mostly in developing countries.
- However, the next few decades may see a decline in global agricultural production growth to roughly 1.5 % and by 2050, the growth rate could decline to approximately 0.9 % (Alexandratos, 2006).
- This slow-down reflects lower global population growth (~ 1.1% per year). However, increasing per capita GDP (2.2-2.4% p.a. for developed countries and 3.6-4.0% in developing countries) and increasing dietary calorie and protein demand will continue to drive agricultural demand.
- The growth in world cereals output in the last 30 years has been made by a 13% increase in cultivated land and a 2.0% increase in productivity in the last 45 years, 1.3% last 20 years (cereals) (Alexandratos, 2006). Maize and rice have seen yield increases but most crops have had low yield growth rates for many years.
- And while the short-term demand has declined, the long-term trend is still intact, according to the recently published Agriculture Outlook by FAO (FAO, 2009).
- In 2009 YTD (through 3Q 2009), the agriculture sector saw approximately \$48 million of venture capital investment with 14 disclosed deals, compared to \$185 million in 2008 with 24 disclosed deals and \$209 million in 2007 with 19 disclosed deals.

III. Market Sizing of Climate Change Sectors

Water demand also remains as one of the key sustainability challenges.



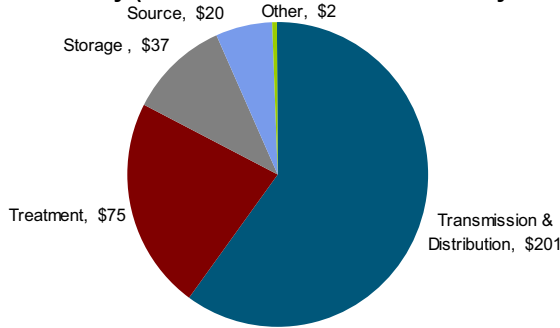
Water demand is increasing rapidly, with consumption coming across multiple sectors. Agriculture consumes a majority of water globally.

- Key water investment opportunities fall into six main categories: Clean water; Conservation: reuse / recycle; Waste management; Energy mitigation; Next generation desalination; Storm water management.
- Since 1998, 109 individual water companies have received VC funding totaling \$1.12 billion. Approximately 59% of this has been invested since 2007. Since 1998, 39 water-focused companies have gone public on major exchanges, raising a total of \$4.8 billion. Of these IPOs, 14 have been public water utilities.
- Water stress can contribute to local or regional conflict. Also, there are huge water basins where large amounts of people rely on a single watershed for their livelihood, like the 1 billion+ people living directly along the Ganges River watershed. This makes the water issue a unique potential tipping point.
- At a corporate level, water access is often required for a variety of low-high tech processes, limiting areas of access.
- Finally, because 70% of global water consumption is related to agriculture, the direct link between food and water is incredibly important and impacts almost all points of the economic value chain for both developing and developed societies.

III. Market Sizing of Climate Change Sectors

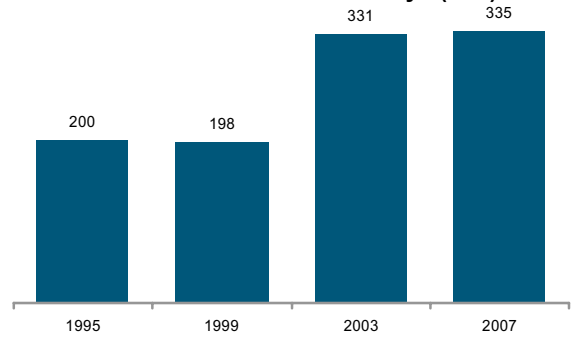
However, water Infrastructure is capital intensive, requiring additional investment.

Total 20-Yr water Infrastructure, Investment by Project Type – 2007 EPA Survey (Total National Need 2007 survey = \$355bn)



Source: 2007 EPA Drinking Water Infrastructure Needs Survey and Assessment

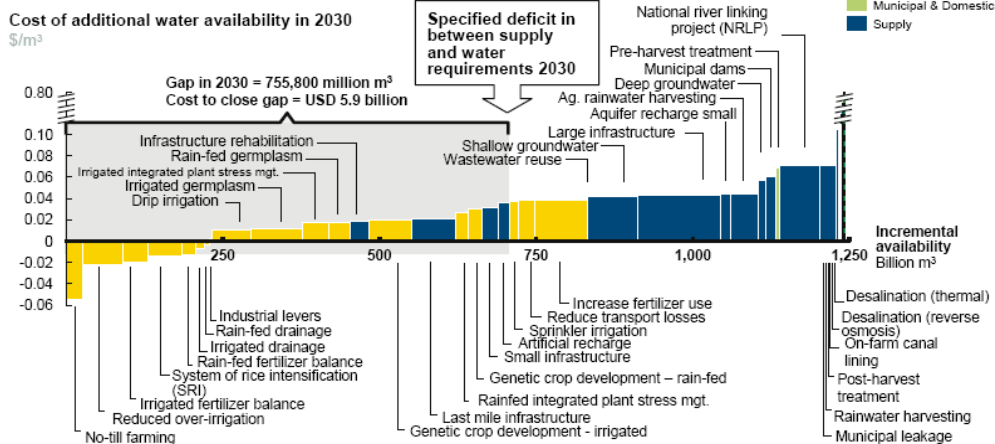
Change in 20-Yr Water Infrastructure, Investment need in four successive EPA surveys (\$bn)



Source: 2007 EPA Drinking Water Infrastructure Needs Survey and Assessment. *The amounts are reported in January 2007 Dollars.

Example: India – Water availability cost curve

India – Water availability cost curve



SOURCE: 2030 Water Resources Group

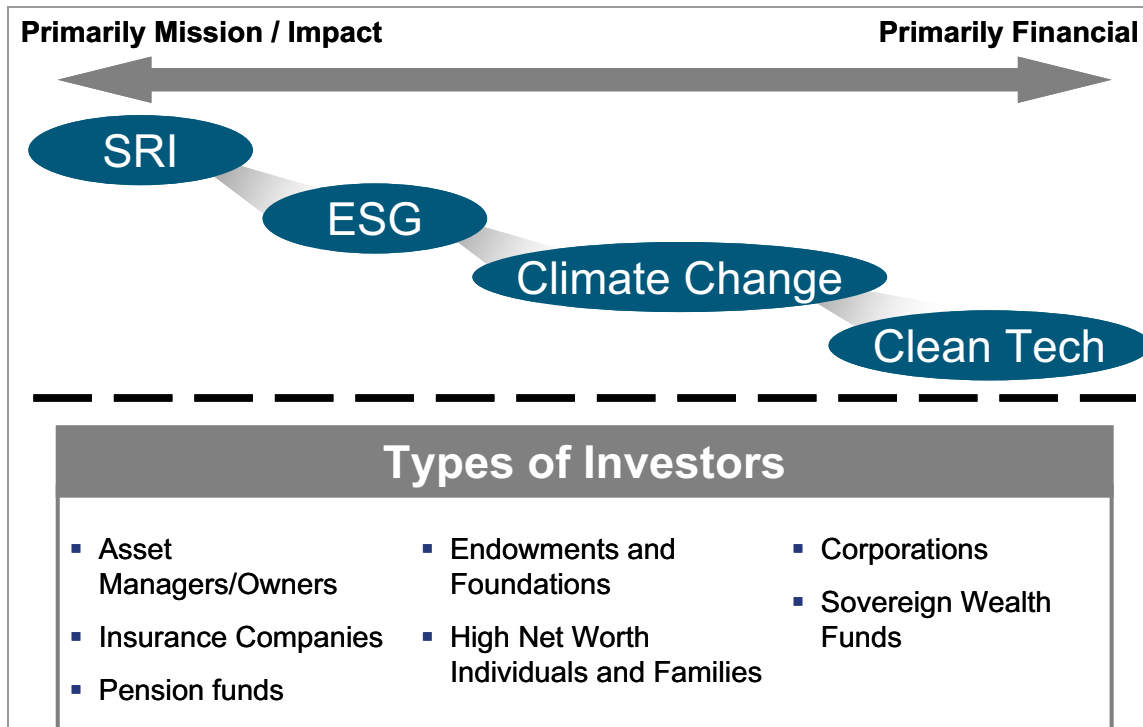
- In order to meet increased water demands, accessible supply implies the ability of infrastructure development to deliver water supply.
- In the U.S., according to the EPA, there are significant water infrastructure needs and this will require investments from the public as well as the private sector.
- McKinsey developed a “water-marginal cost curve”, which provides an analysis of the cost and water supply potential of existing technical measures needed to close the projected gap between demand and supply in a basin (see India example above). The curve finds the following results:
 - Increased agricultural productivity is fundamental: There needs to be improved efficiency of water application and the net water gains through crop yield enhancement. Areas of potential growth include technology infrastructure for water application, such as increased drip and sprinkler irrigation.
 - Increased efficiency in industry and municipal systems: In addition to agriculture, water for industrial and urban uses are growing at a fast rate, particularly in developing countries such as China.
 - Quality and quantity of water are inter-related: According to McKinsey, improvements in water technology such as spring-valve installation and sensitivity sensors can offer significant water use reductions while also offering financial advantages. In addition, utility leakage reduction can save nearly 300 million m³ of water.

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IV. The Investors

Investment mandates are both hierarchical and distinct. Many different types of investors will be interested in climate change.

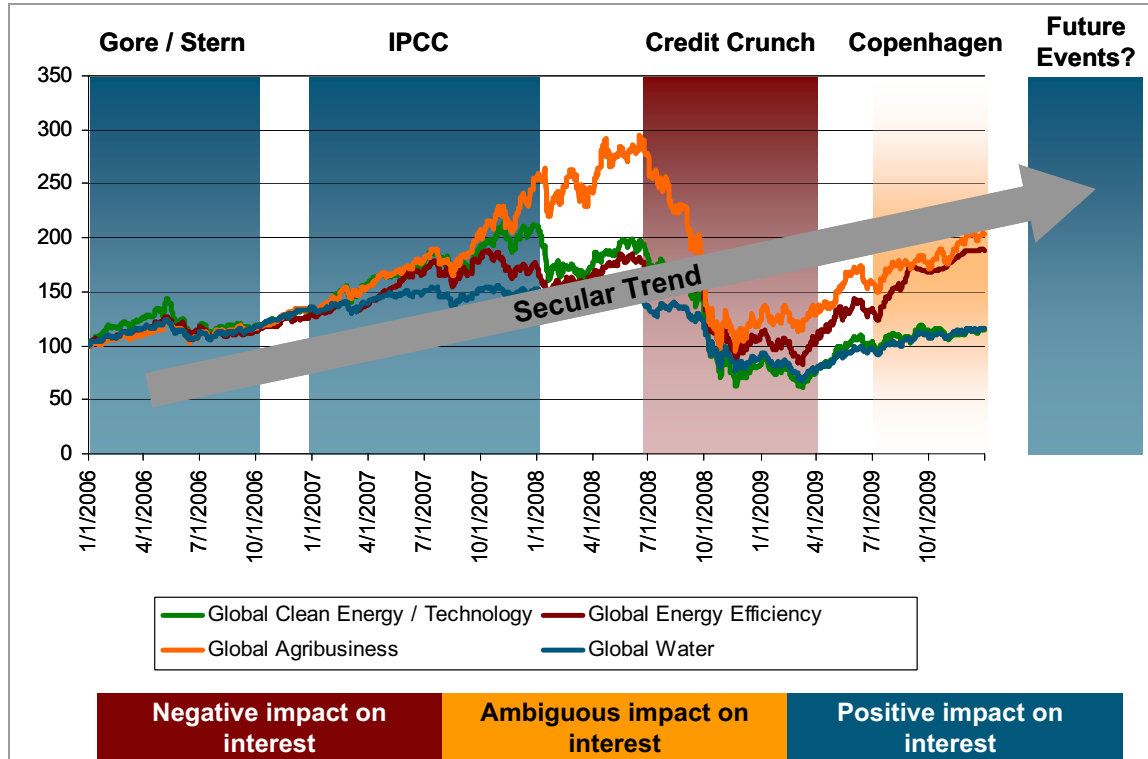


In the context of climate change investing, we use two primary filters to understand the goals and perspectives of different

- These are investment focus and type of investor
- Investment focus implies the philosophy or approach that the investor is using to evaluate opportunities and can include Socially Responsible Investment (SRI), Environmental Social and Governance (ESG), or climate change and clean tech focused investors
- The type of investor covers the different kinds of organizations and institutions investing, whose goals and timeframe can be generally grouped together
- The different types of investors include asset managers, insurance companies, pension funds, endowments, etc
- These groups broadly overlap and are not absolute boundaries. It is important for investors to understand where they fall within the buckets and to appreciate how their investor type should shape their approach to asset allocation and risk budgeting.
- Investors can pursue climate change investment opportunity through evaluating how they have performed in the past, what we forecast and how an investor can use strategic asset allocation to capture alpha opportunities from these markets while maintaining their investment goals, whether it be liability driven, such as pension funds, wealth accumulation for families, or mission driven for the endowment/foundation investor.
- Different investors will seek different asset strategies requiring a multitude of investment options within the universe of climate change investment

IV. The Investors

Major catalyst events drive investor interest in climate change sectors, supporting the underlying positive secular trend.



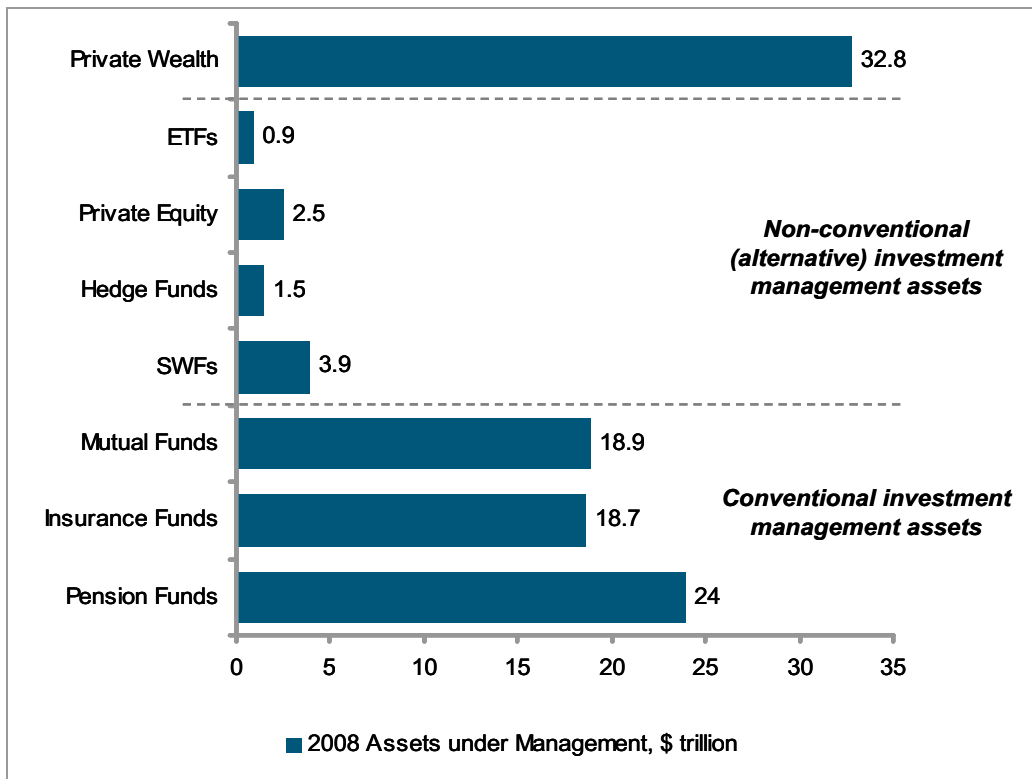
Source: Bloomberg, DBCCA analysis, 2010. Note: Indices based to 100 as of January 1, 2006.

Climate change investment is a secular trend driven by the underlying science and government policy. Investor interest in climate change has been shaped by major events, reports and educational milestones. General market trends also influence investor sentiment towards climate change sectors.

- We recognize public interest in climate change will fluctuate around other priorities such as jobs and the economy.
- We believe investors will continue to be attracted to climate change because of the long term structural changes and opportunities. We see three main pressure groups ensuring that climate change remains on the public and corporate agenda.
 1. International organizations are likely to continue demanding climate change initiatives.
 2. Government action –likely to be driven in part by public demand for policies, and the possibility to create jobs and growth.
 3. We believe the science and the impact on the planet will continue to prove the case.
- The confusion of “Climate Gate” and Copenhagen may push some investors back to a focus on clean tech for energy security and energy independence reasons rather than primarily environmental considerations

IV. The Investors

The fund management industry has a large amount of capital to deploy.



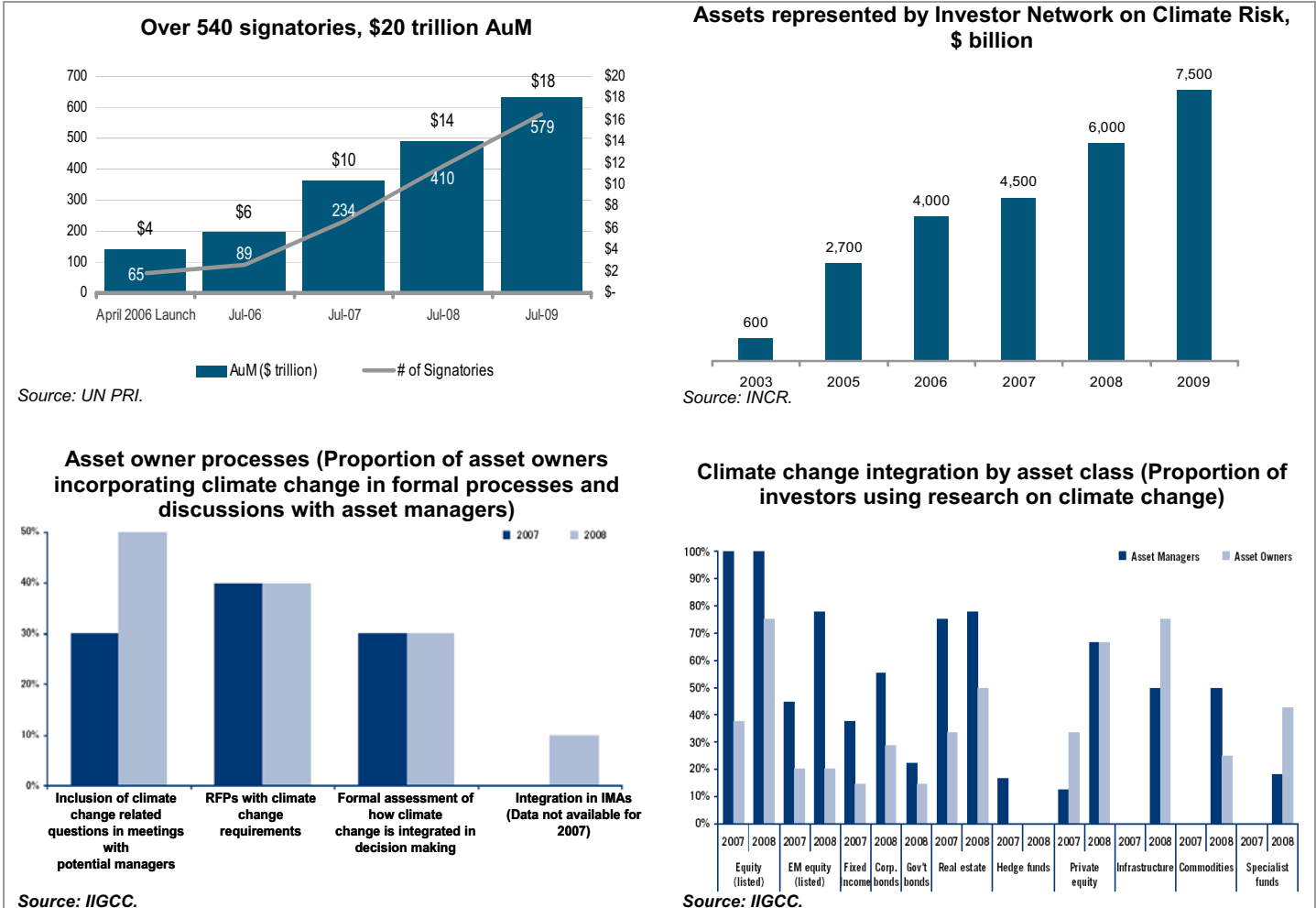
Source: IFSL estimates

Large amounts of capital exist across the fund management industry. Mitigation and adaptation to climate change will require large investment dollars.

- The fund management industry has a large variety of capital sources.
- Capital is distributed into a variety of vehicles and asset classes.
- The various asset owners and managers, combined have significant capital resources available for investing in the climate change sector.
- The majority of the assets are held in OECD countries, yet they are invested in a global manner.
- There is obviously significant capital available in investment markets. However, the risk / return profile needs to be acceptable to these investors. In climate change sectors, government action is required to create Transparency, Longevity and Certainty.

IV. The Investors

Institutional investors have embraced responsible investing and climate change as part of their mandates.

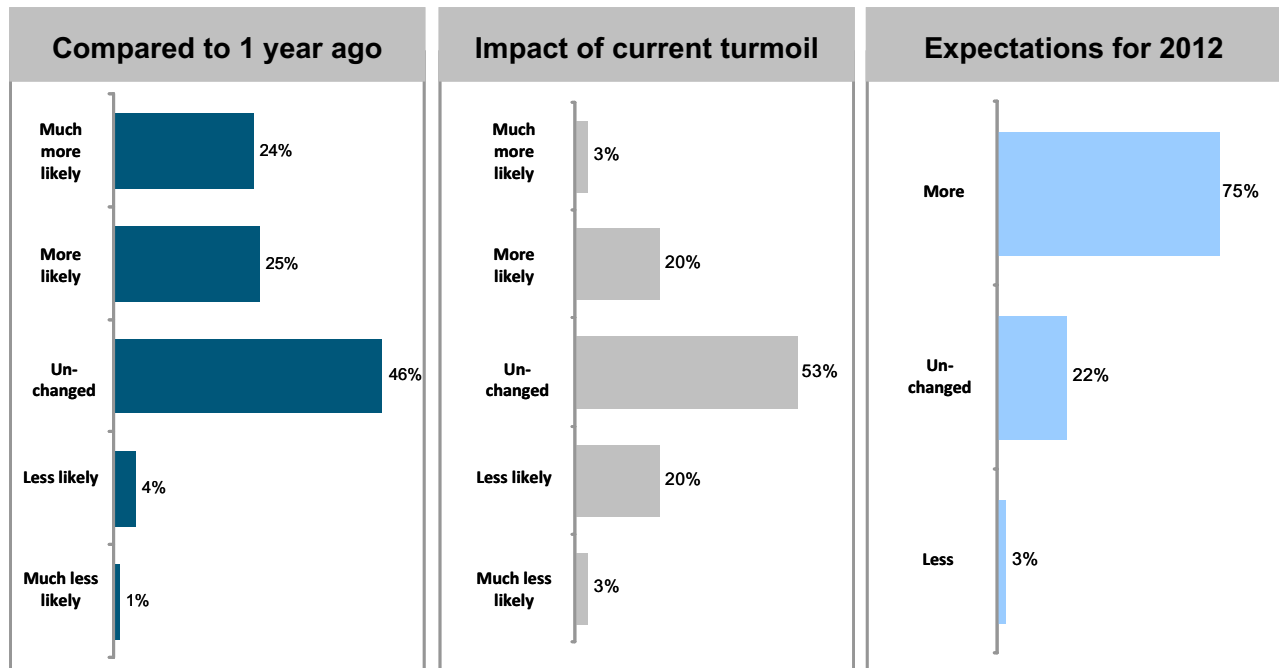


As evidenced by various high profile agreements, institutional investors are publicly demonstrating their interest in climate change investments

- The Investor Network on Climate Risk (INCR) is a network of 80 institutional investors and financial institutions, with more than \$8 trillion of assets under management. They seek to better understand the financial risks and investment opportunities posed by climate change.
- The Institutional Investors Group on Climate Change (IIGCC), established in 2001, is a collaborative network of European pension funds and other institutional investors that seek to address the investment risks and opportunities associated with climate change. There are currently over 50 members, with assets of over EUR 4 trillion under management.
- The Carbon Disclosure Project (CDP) collects and distributes information on the business risks and opportunities presented by climate change and greenhouse gas emissions data from over 2500 organizations in some 30 countries, including some of the world's largest companies. They currently represent over 470 institutional investors with over \$55 trillion of assets under management.
- A significant number of mainstream investors have "turned a corner" on how they put responsibility into practice, according to the third annual assessment of signatories to the Principles for Responsible Investment (PRI). Key findings show signs of a growing culture of active ownership and collaboration among investors.

IV. The Investors

NEF survey of asset managers shows increasing momentum towards clean energy investments.



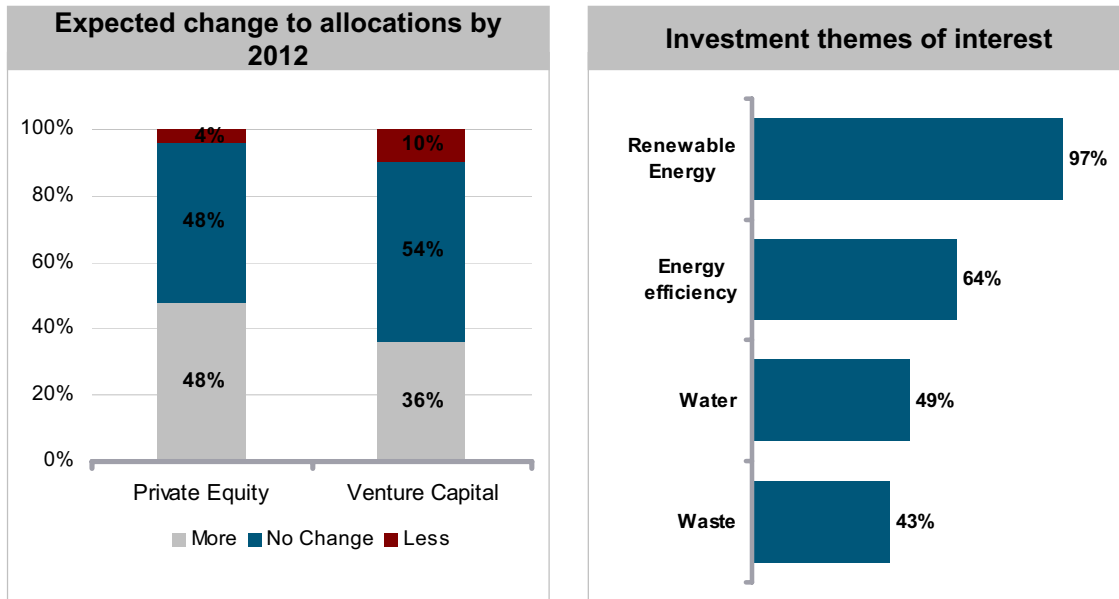
Source: New Energy Finance, 2009. Note: Figures above are based on a survey of 106 institutional investors, with approximately \$1 trillion assets under management in total. Results are as of March 2009.

Asset managers reported that there is sustained and even increasing momentum towards clean energy.

- In March 2009, New Energy Finance surveyed 106 institutional investors, with approximately \$1 trillion assets under management in total. Asset managers for these investors report increasing momentum.
- Asset managers are pursuing clean energy aggressively, with 75% expecting greater investment in the sector by 2012
- A majority of asset managers reported that the current turmoil would have no effect on investments in clean energy or that investments were more likely in spite of it
- Very few asset managers expect relative investment levels to decrease compared to the previous year, with only 5% taking a pessimistic view
- However, 49% reported that investments were either much more likely or more likely than a year ago, demonstrating the increase in investor interest in the space

IV. The Investors

Institutional investors maintain interest in PE/VC and climate change sectors, according to NEF survey.



Source: New Energy Finance, 2009. Note: Figures above are based on a survey of 106 institutional investors, with approximately \$1 trillion assets under management in total. Results are as of March 2009.

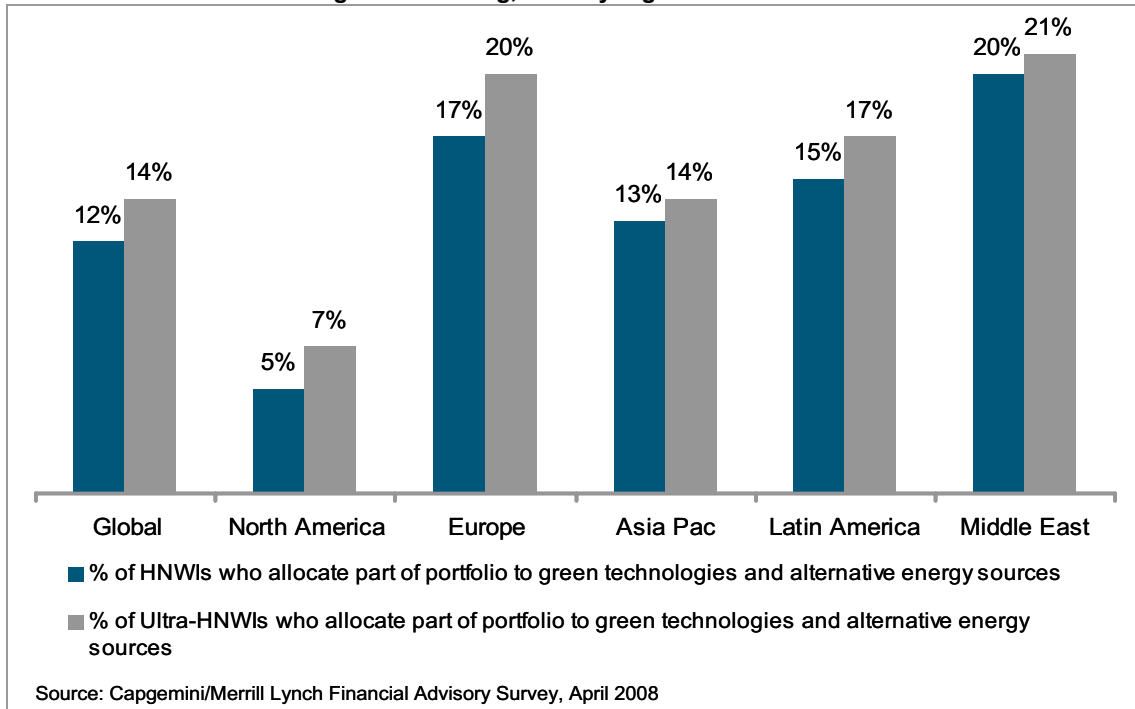
Institutional investors continue to believe in the climate change theme, with expectations to increase or hold steady investments in the sector.

- In March 2009, New Energy Finance surveyed 106 institutional investors, with approximately \$1 trillion assets under management in total.
- Most investors reported that renewable energy would be of interest, with strong interest also focused on energy efficiency.
- Private equity received stronger report, with 49% expecting an increase compared to only 36% for venture capital.
- Although investment in the sector has decreased through 2009, the long-term trend remains strong.
- Investors expected the heavy interest in the sector to allow it to recover more quickly from the recovery that the broad public markets, a development which occurred during 2009.
- This out-performance is expected to continue through 2010, with the advent of governments deploying large amounts of stimulus dollars into climate change sectors.

IV. The Investors

American HNWI's are under represented in global green investing, though wealthy investors have allocated heavily to green investments globally.

HNWIs' and Ultra-HNWIs' interest in green investing, 2007 by region



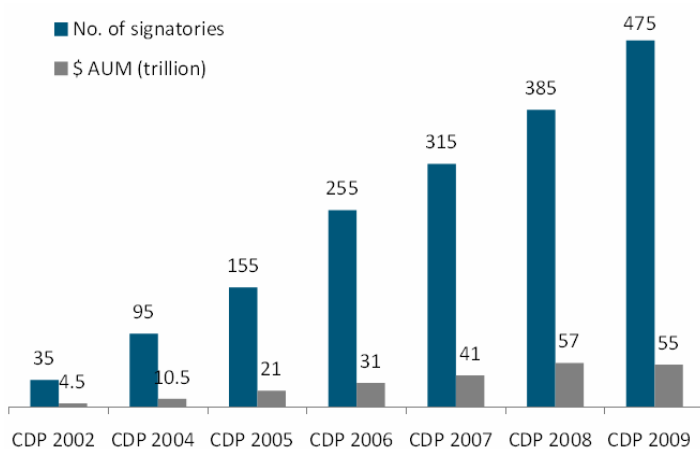
A survey of high-net-worth (HNW) and ultra-high-net-worth (UHNW) investors showed that a large number have already begun allocating to clean energy investments. Investor interest varies in scale across geographies.

- Both HNW and UHNW investors allocate strongly to green investments – represented here by clean / alternative energy sectors
- The relative level of investor interest varies both by geography and by investor net worth, with UHNWIs more heavily allocated to the sector across all geographies
- Geographic variation shows that European and Middle-Eastern investors are most heavily allocated to the sector, with both classes of North American investors less heavily allocated than any other category
- In all geographies these allocations indicate that HNWI and UHNWIs are heavily overweighting clean energy
- Our analysis indicates that clean energy is approximately 1% of total public equity markets.

IV. The Investors

Corporations are investing to lower their own carbon emissions.

CDP signatory investors over time



Source: CDP. DBCCA analysis, 2010.

	Dollars Invested
Current Projects	\$181.2 Billion
Future Projects	\$156.4 Billion
TOTAL:	\$337.7 Billion

Increasing corporate investment in emissions reduction of their own carbon footprint highlights the fundamental shift to a low-carbon future.

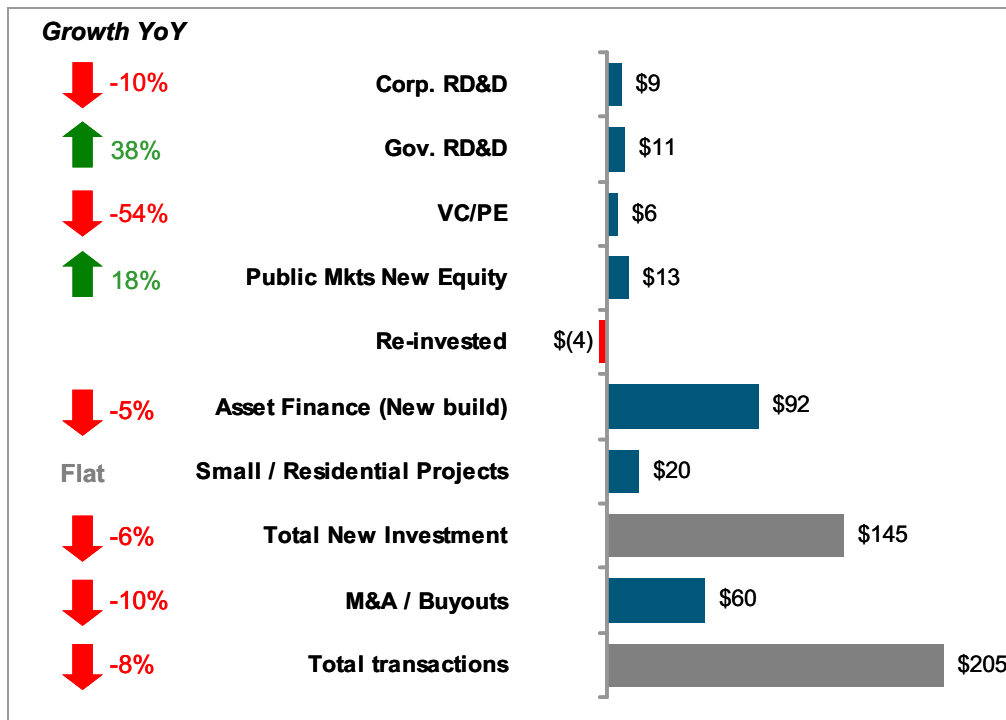
- The Carbon Disclosure Project (CDP), which gathers data on behalf of over 475 institutional investors, has encouraged around 2,500 organizations in some 30 countries around the world to measure and disclose their greenhouse gas emissions and climate change strategies through CDP, in order that they can set reduction targets and make performance improvements.
- Signatories to the CDP have grown over the past decade demonstrating increased interest in assessing risks and opportunities from climate change. The Asset Under management supporting CDP show the largest support from global investors – from \$4.5 trillion in 2002 to \$55 trillion in 2009.
- Corporations have disclosed a large amount of investment to reduce emissions via the CDP
- In response to question 23.11, asking what investments have been made to reduce emissions, there were 2,642 responses to question about current projects. Of these, 802 provided a value for current investment, revealing a total value of \$181.2 billion.
- In response to question 23.12, asking what investments would be made to achieve future reductions, there were 2,500 responses to questions about future projects. Of these, 545 provided a value for future investment, revealing a total of \$156.4 billion.
- The high level of corporate investment is evidence of the impact that government regulation and public awareness has had on the world's companies.
- Investment in future emissions reductions projects is expected to increase, as the world moves closer to a binding global emissions reduction deal via the UN negotiation process.

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V. Climate Change Investment Markets

Overall global investment in clean energy in 2009.



Source: New Energy Finance, 2009. Note: Includes 4Q2009 running average. Financial sector investment only (i.e. excludes corporate and government R&D, and residential scale projects. Not adjusted for re-invested equity. Total values include estimates for undisclosed deals.

Total new clean energy investment in 2009 decreased by 6% compared with 2008 levels, primarily due the economic crisis; however, the decrease was less than what many had expected. In particular, the 2009 YoY decrease was largely attributed to declines in project finance and venture capita/private equity investment, while new equity raised in public markets saw a healthy rebound.

- Overall, most sectors were largely impacted by the economic crisis in the first quarter of 2009, with slight rebounds in the second and third quarters, and then trailing off in the final quarter of the year.
- New Energy Finance finds that clean energy investment was able to remain relatively stable in 2009 due to a 25% YoY investment increase in the Asia-Oceania region, which saw \$37.3 billion of new investment, compared with the Americas which saw \$32 billion of investment.
- Capital flows are highly dependent on public policy support and subsidies and investor confidence in the sustainability and longevity of those policies. Markets with the most stable policy frameworks will attract the largest capital flows.
- The next few sections present a quarter-by-quarter view of capital flows into clean energy, agricultural and water sectors.

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V. Climate Change Investment Markets: Public Markets

Climate change outperforms the broader public equity market across all time frames.

Public market performance of climate change sectors

	From Market Bottom**	1 Year	3 Year
MSCI World	69.7%	27.0%	-7.1%
Global Clean Energy / Technology*	87.9%	39.7%	15.0%
Global Energy Efficiency*	125.6%	70.7%	87.2%
Global Agribusiness*	77.3%	63.6%	103.6%
Global Water*	73.6%	28.2%	15.9%

* WilderHill New Energy Global Innovation Index (NEX), CRB Research Energy Efficiency Index, DAXglobal Agribusiness Index, S&P Global Water Index

** Market bottom refers to 2009 low of MSCI World on March 9, 2009

Source: Bloomberg, CRB Research, 2010.

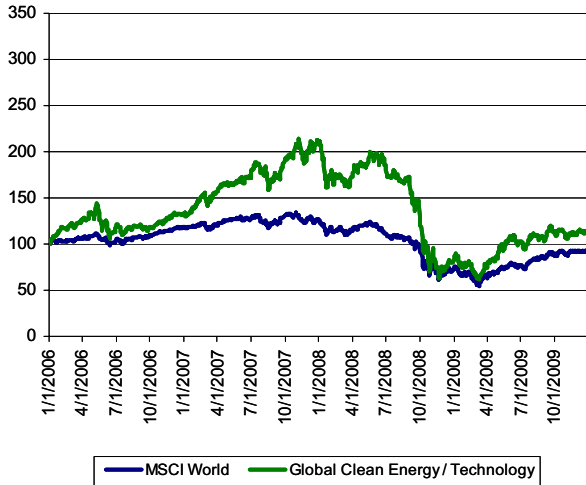
Climate change sectors have outperformed the broader public market since the market bottomed in March of 2009. Agribusiness and energy efficiency have led performance, with all primary sectors showing strong returns over the last 3 years.

- The global clean energy and technology sectors, as represented by the NEX, cover areas such as renewable power generation sectors. While these industries were affected by the credit crisis, and other exogenous economic factors, they significantly out-paced the world benchmark during the recovery period. Power storage and electric cars all contributed positively to performance.
- Energy efficiency companies have garnered significant returns from the market bottom, increasing over 125%. Energy efficiency continues to be a high growth subsector due to its low capital costs and fairly immediate investment payback. As with the other subsectors, public policy support from the stimulus packages—set to have maximum impact in 2010—is the primary catalyst.
- Agribusiness has continued to be a strong sector over the three year time period. Pricing in agricultural commodities have eased along with the pullback in oil prices from the 2008 highs. Forward valuations are now more modest and the sector has tremendous leverage due to accelerating economic growth in emerging markets. This will benefit low cost producers and companies with a productivity advantage as cropland again becomes scarcer.
- Global water investing continues to be a long term trend. Returns for the Index over the 3-year period showed out performance of over 20%. Because the water index is heavily weighted to water utilities (40%), the short-term performance is influenced by credit constraints, whereas long-term performance is attributed to earnings and dividend growth.
- Although not represented here, we note that in the clean energy sector, solar and wind companies also led the public markets from the market bottom in 2009.
- Relative performance of climate change sectors that rely most heavily on subsidies, such as solar, are influenced by their levelized-cost-of-energy breakeven relative to other generation types and take their cues from natural gas and coal commodity prices.

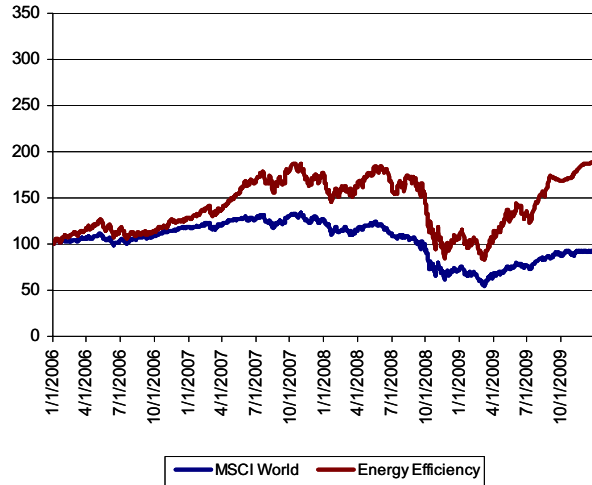
V. Climate Change Investment Markets: Public Markets

Global clean energy and energy efficiency both outperform the broader public equity market across all time frames.

Performance of Global Clean Energy / Tech vs. MSCI World (Jan 1, 2006 - Dec 31, 2009)



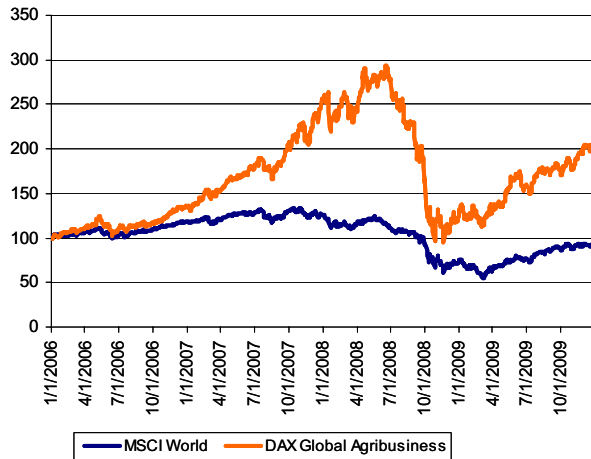
Performance of Global Energy Efficiency vs. MSCI World (Jan 1, 2006 - Dec 31, 2009)



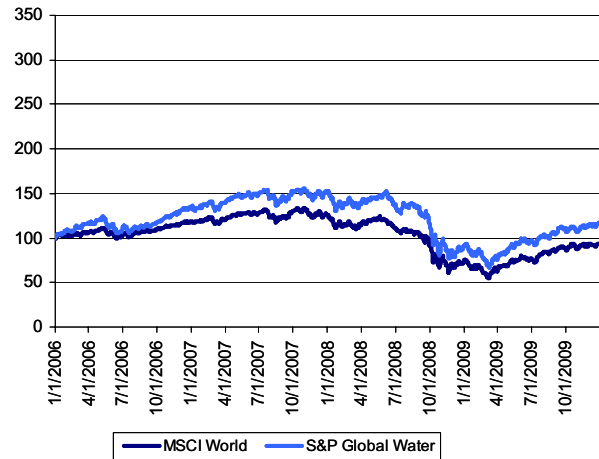
Source: Bloomberg, CRB Research, 2010. Note: Indices based to 100 as of January 1, 2006.

Global agribusiness and water also outperform the broader public equity market across all time frames.

Performance of Global Agribusiness vs. MSCI World (Jan 1, 2006 - Dec 31, 2009)



Performance of Global Water vs. MSCI World (Jan 1, 2006 - Dec 31, 2009)



Source: Bloomberg, 2010. Note: Indices based to 100 as of January 1, 2006.

V. Climate Change Investment Markets: Public Markets

Consensus market forecasts for climate change sectors show large earnings growth expectations.

	EPS Growth (%)			PE(x)			DPS growth (%)			Dividend Yield (%)		
	2008	2009e	2010e	2008	2009e	2010e	2008	2009e	2010e	2008	2009e	2010e
Low carbon energy production	-10	-6.5	38	19.8	21.2	15.3	-16.9	8.6	12.2	1.4	1.8	2.1
Bio-energy	25.6	-13.4	25.4	15.5	18	14.4	-37.6	22.8	19.6	1.3	2	2.4
Diversified renewable	1.7	39.3	23.1	30	21.5	17.5	233.5	18.5	16.3	0.7	1.1	1.3
Gas	0.2	-1.6	11.8	18.3	18.5	16.6	12.5	2	6.2	2.3	2.4	2.5
Geothermal/hydro/marine	21	29	13.4	24.4	19.4	17.1	-21.5	7.7	7.8	0.8	1	1.1
Integrated power	-8.5	17.1	4	14.9	12.8	12.3	8.6	-3.4	3.5	4	4.3	4.4
Nuclear	-12	8.3	8.9	18.2	16.7	15.2	9.4	1.6	4.5	2.3	2.3	2.4
Solar	-68.3	n/m	n/m	39.7	n/m	22.1	-5.4	-27	4.7	0.8	0.7	0.7
Wind	-72.2	n/m	n/m	41.2	n/m	18.1	90.1	-13.2	18	0.1	0.4	0.5
Energy efficiency & energy management	-34.8	-7	40.6	23	25.2	17.9	-17.9	-8	5.7	1.1	1.6	1.7
Building efficiency	-58.1	-28	128.9	28.5	39.6	17.3	-31	-7.2	9.8	1.8	1.8	2
Energy storage	-3.2	134.9	29.5	45.9	22.8	17.6	10.2	-2.4	5.5	0.6	0.6	0.6
Fuel cells	-88.3	128.6	127.8	135	59.1	25.9	n/m	-22.2	24.3	1.1	0.8	1
Industrial efficiency	-24.4	17.8	26.2	25.7	21.8	17.3	-2.5	0.5	4.1	1	1.9	1.9
Transport efficiency	-13.7	-61.9	44.3	11.4	29.8	20.6	-30.5	-49.5	5.9	0.8	1.2	1.3
Water, waste & pollution control	-2.7	-3.9	5.3	16.3	17	16.1	19.2	10	2.2	2.4	2.7	2.7
Pollution control	20.1	13.9	7	15.9	14	13	n/m	n/m	142.9	0	0	0
Waste	2.9	-3.4	16.6	20.5	21	18	48.1	16.9	5.1	1.8	2.1	2.2
Water	-6.3	-4.8	-3.5	13.2	14	14.3	3.6	5.4	0.2	3.2	3.5	3.5
Global equities (MSCI World)	-33.6	-7.9	29.3	16.7	18	14	-8.7	-11.7	7.5	2.9	2.6	2.8

Source: HSBC, Thomson Financial Datastream, I/B/E/S, HSBC Equity Strategy.

Analysts are looking for large year-over-year earnings recovery in 2010.

- Valuations for the climate change sectors based on 2010 forward P/Es are low relative to recent year comparisons and reflects expectations of a strong cyclical earnings recovery.
- Dividends are growing less than earnings, which reflects a general trend toward cash management and investing in the core business opportunities.
- Dividend yields for the HSBC Climate Change Index are less than the MSCI World Index, which is a reflection of the capital intensity of climate change sectors and growth prospects relative to the broader MSCI Index.
- Secular growth in climate changes sectors will continue, driven by innovation, cost reduction and new market penetration opportunities.

V. Climate Change Investment Markets: Public Markets

Climate change sector correlations to the broader market and energy commodities.

From bottom of Market

	MSCI World	Crude Oil	Natural Gas	Global Clean Energy / Technology	Global Energy Efficiency	DAX Global Agribusiness	S&P Global Water
MSCI World	1.00						
Crude Oil	0.92	1.00					
Natural Gas	0.18	0.19	1.00				
Global Clean Energy / Technology	0.94	0.90	0.10	1.00			
Global Energy Efficiency	0.98	0.88	0.20	0.89	1.00		
DAX Global Agribusiness	0.96	0.91	0.30	0.92	0.96	1.00	
S&P Global Water	0.99	0.92	0.19	0.95	0.98	0.97	1.00

<0.4 0.4 - 0.85 0.85+

2009 / 1 Year

	MSCI World	Crude Oil	Natural Gas	Global Clean Energy / Technology	Global Energy Efficiency	DAX Global Agribusiness	S&P Global Water
MSCI World	1.00						
Crude Oil	0.89	1.00					
Natural Gas	-0.09	-0.26	1.00				
Global Clean Energy / Technology	0.95	0.91	-0.20	1.00			
Global Energy Efficiency	0.98	0.91	-0.14	0.93	1.00		
DAX Global Agribusiness	0.96	0.93	-0.11	0.95	0.97	1.00	
S&P Global Water	0.99	0.89	-0.07	0.96	0.98	0.96	1.00

<0.4 0.4 - 0.85 0.85+

2006 - 2009 / 3 Year

	MSCI World	Crude Oil	Natural Gas	Global Clean Energy / Technology	Global Energy Efficiency	DAX Global Agribusiness	S&P Global Water
MSCI World	1.00						
Crude Oil	0.45	1.00					
Natural Gas	0.57	0.68	1.00				
Global Clean Energy / Technology	0.89	0.71	0.63	1.00			
Global Energy Efficiency	0.53	0.66	0.24	0.74	1.00		
DAX Global Agribusiness	0.41	0.84	0.50	0.75	0.84	1.00	
S&P Global Water	0.96	0.58	0.59	0.96	0.70	0.62	1.00

<0.4 0.4 - 0.85 0.85+

Source: Bloomberg, CRB Research, 2010. Note: Market bottom refers to 2009 low of MSCI World on March 9, 2009.

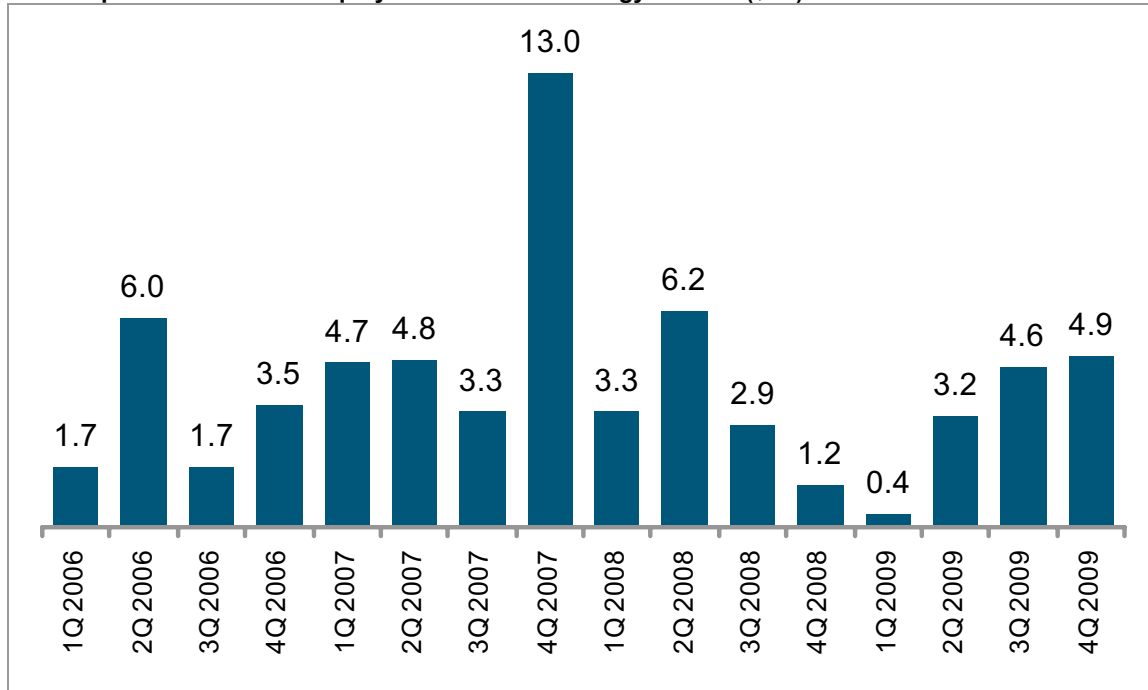
Longer term, climate change sectors are less correlated to other indices and commodities, although they have recently been more highly correlated.

- During 2009, all sectors were highly correlated, with the exception of natural gas.
- While in 2009 markets were highly correlated, over the three year average from 2006, climate change correlation with markets was more moderate
- We would expect climate change sectors to return to the more moderate correlation of the three year average.

V. Climate Change Investment Markets: Public Markets

Equity raises have been volatile over recent quarters, with a decrease since mid-2008.

Global historic public market new equity raised in clean energy sectors (\$bn)



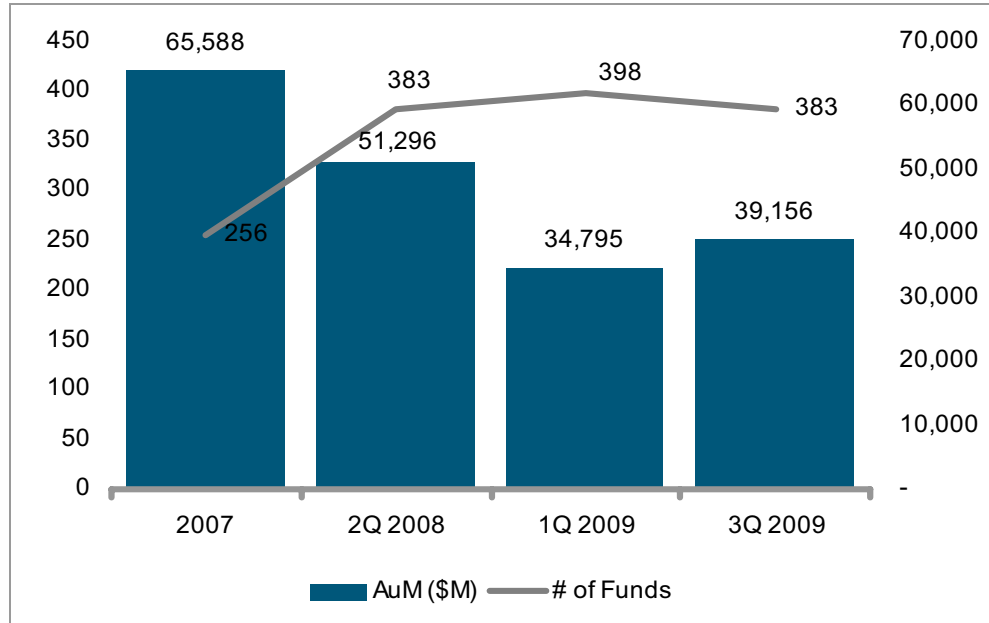
Source: New Energy Finance, 2010. Note: Includes 4Q2009 running average.

New Energy Finance records initial public offerings (IPOs) for clean energy firms, showing a strong decline over the 2007-2008 period. However, the Cleantech Group reports that in 2009 twenty-nine clean tech companies went public, the majority of them small listings in China.

- The most significant clean tech IPO of the year was A123Systems (Nasdaq: AONE), which raised \$380 million when it went public on the Nasdaq in September. As of publication, it has an approximately \$2.3 billion market cap.
- The strength of the IPO market reflects the underlying health and risk appetite of the capital markets.
- In the recent economic downturn, public market new issue equity financing became expensive and unavailable to many companies.
- A healthy IPO market helps private equity investors by providing a comparison to private market values and a benchmark by which to potentially time and value exits.
- IPOs also helps the climate change sector; as more companies come to market, liquidity increases.

V. Climate Change Investment Markets: Public Markets

Climate change-related Mutual Funds / ETFs have approximately \$40 billion of Assets under Management, as of 3Q 2009.



Source: Lipper FERI, Strategic Insight, DBCCA analysis, 2010.

While climate change-related mutual funds have experienced the impact of the recent economic downturn in recent years, total assets under management held in these products have gradually increased over the course of 2009, with the number of funds remaining relatively stable.

- Within climate change-related mutual funds/ETFs, there are a number of “sectors” or themes that we would identify. Using Lipper FERI and Strategic Insight databases, we identified funds in the following categories: Agriculture, Alternative & Renewable Energy, Climate, Environmental, Green & Sustainable, and also Water.
- The concentration of the majority of these funds can be found in Europe, followed by Asia, and then the US. This has been the trend since 2007.
- The largest funds by AuM are driven by investments in renewable energy; however, interestingly, many of the largest funds are also heavily allocated in agriculture and water-related sectors.

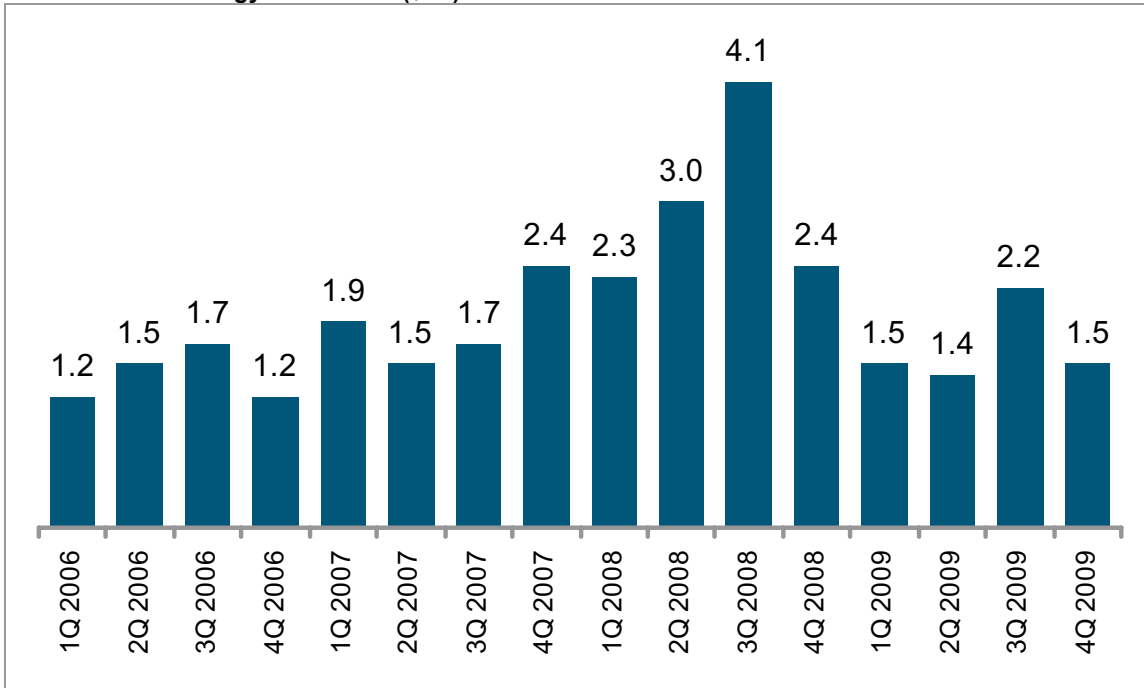
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V. Climate Change Investment Markets: Private Equity / Venture Capital

Private equity / Venture capital in clean energy markets.

Global PE/ VC clean energy investment (\$bn)



Source: New Energy Finance, 2010. Note: Includes 4Q2009 running average.

Venture capital and private equity flows into clean energy reaccelerated in 3Q09 posting a sequential increase after three consecutive quarterly declines

Clean energy companies in 3Q09 saw:

- \$2.2 billion of new VC and PE investment was posted in 3Q09, up from \$1.4bn in 2Q09, representing a 57% increase.
- However, the 3Q09 PE/VC investment figure of \$2.2 billion is still only about half of the \$4.1 billion attained in the same quarter in 2008.
- Solar companies raised the most in the quarter, followed by energy efficiency companies, with market shares of 36% and 22% respectively of total investment flows.
- According to NEF, the highest sector/region combination for the quarter was solar in the Americas (mainly driven by US PV companies), which are benefiting from the government tax credits and demand pull from state renewable portfolio mandates.
- The Americas region continued to dominate the overall PE/VC space, accounting for 65% of new investment for 3Q09.

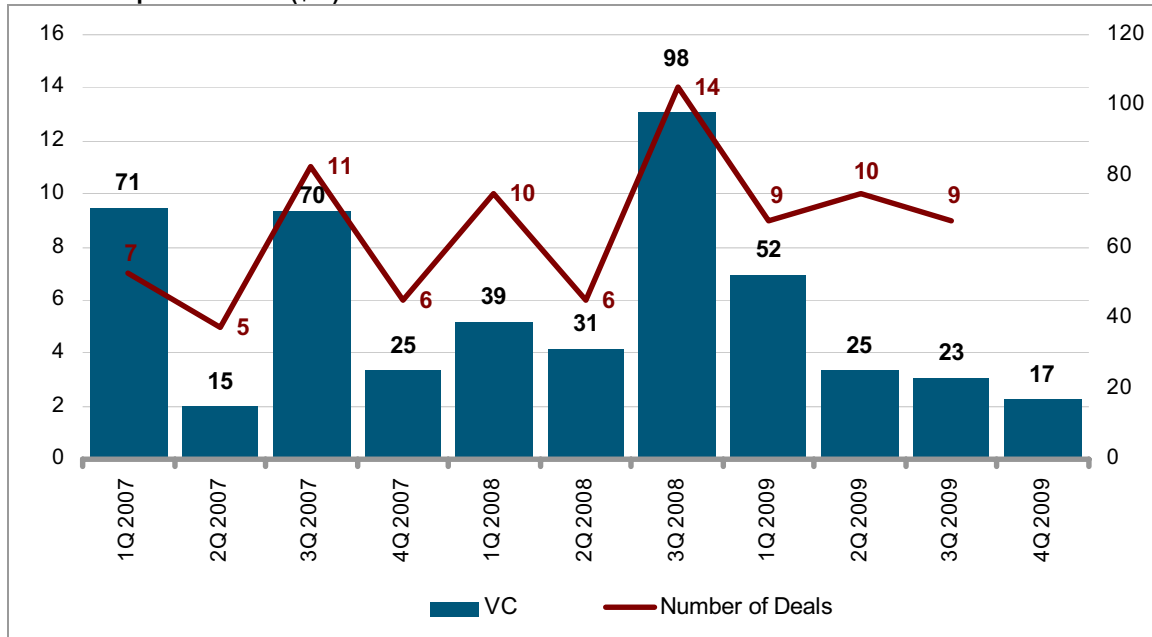
Overview of 4Q09:

- There was approximately \$1.5 billion of PE/VC investment in 4Q09, with the majority of the investment going into the Americas, followed by EU Europe.
- The wind sector saw the most PE/VC investment in the fourth quarter, followed by energy efficiency and solar sectors.

V. Climate Change Investment Markets: Private Equity / Venture Capital

Water venture capital investment has seen a recent downturn, though it remains a key area of investor interest. A rebound is likely with the influx of stimulus dollars to the sector.

Global venture capital in water (\$m)



Source: Cleantech Group, 2009. 4Q 2009 figures is a preliminary estimate.

Water venture capital investment has seen a recent downturn, though it remains a key area of investor interest.

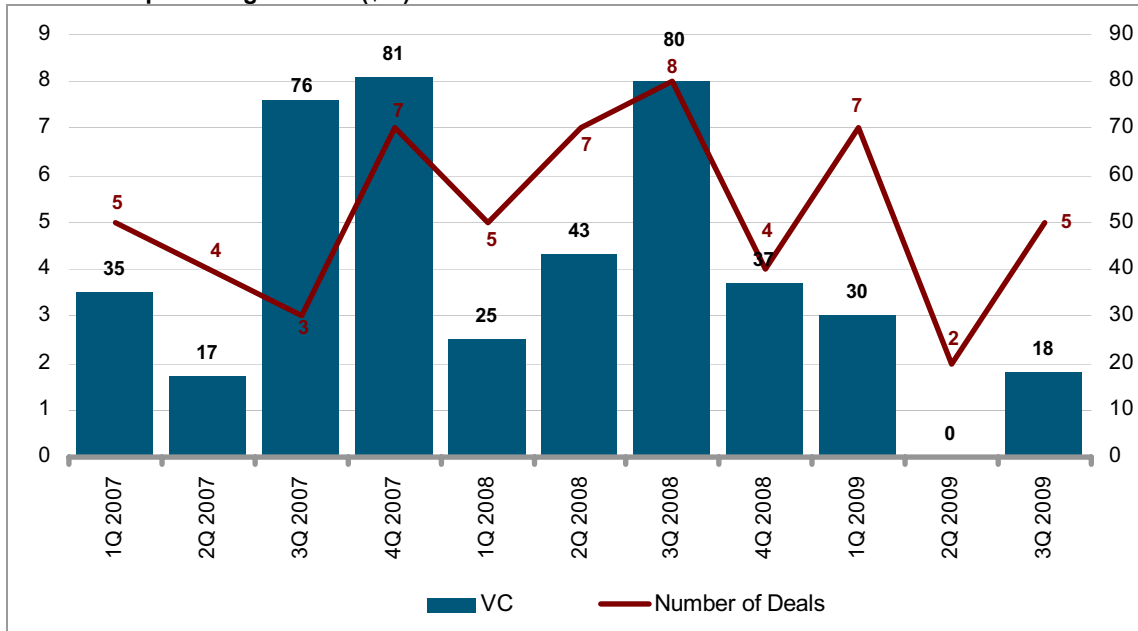
There were nine VC water financings in 3Q09 totaling \$23 million, very similar to the investment totals in 2Q09 (when there were 10 deals worth \$25 million).

- The water sector is set to be one of the main beneficiaries of global stimulus spending, but as also noted for other sectors the industry has held back on capital expenditures while it waits for government funds to be allocated. We expect that once these funds are allocated there will be an increasing demand for new water technology solutions and heightened investor interest in the sector.
- There were nine VC water financings in 3Q09 totaling \$23 million, very similar to the investment totals in 2Q09 (when there were 10 deals worth \$25 million).
- Advanced membrane-based separation solutions for water and wastewater treatment as well as the development of ultra-filtration membranes used in water treatment are just examples of new water technologies.
- Water is generally considered to be “under-priced” as a commodity today. Because of the complex regulatory environment governing water pricing, it is difficult for modifications reflecting the value of water to be enacted. As such, proper investments returns in water are often difficult to achieve, thus keeping the sector relatively underinvested compared to global demand for new technologies.

V. Climate Change Investment Markets: Private Equity / Venture Capital

There has been significant, but volatile investment into agricultural venture capital companies.

Global venture capital in agriculture (\$m)



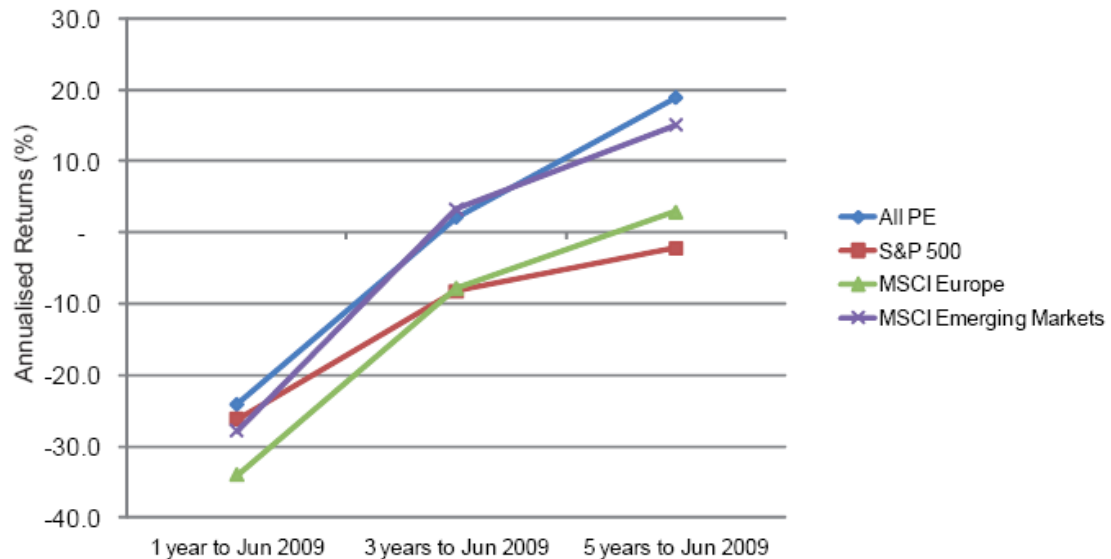
Source: Cleantech Group, 2009.

Agriculture VC investment has seen large amounts of capital invested, with investor demand driven by the need to innovate new technologies to fill the global production gap, highlighted earlier.

- There were five VC financings for agriculture companies in 3Q09 totaling \$18 million. Technology for enhancing crop yields, technology for sustainable forestry production, superabsorbent seed coating technology and sustainable insecticides are some of the types of developments in this sector.

V. Climate Change Investment Markets: Private Equity / Venture Capital

Comparing IRRs shows that PE can generate outperformance.



Source: Preqin, "The 2010 Preqin Private Equity Fund of Funds Review," December 2009.

According to Preqin³, private equity annualized returns are compelling versus public equities across market cycles. Other studies have focused on clean tech private equity.

- Five-year annualized returns for Private Equity were 18.9% compared to -2.2% for the Standard & Poor's 500 Index.
- Both New Energy Finance and the Cleantech Group have conducted studies of the clean tech private equity industry analyzing the performance of the subsector over the past three and five years respectively. While the studies have shown IRRs in excess of target returns for generalist private equity funds, these data were marked-to-market before the recent downturn. These results were also heavily influenced by a few successful IPO's and buyouts. Therefore it is difficult to conclude the degree to which excess returns will be realized relative to VC/PE generalist funds.
- There have been outsized realized returns in the clean tech VC/PE space through IPO exits and M&A buy-outs.
- Since 2004, 324 clean tech PE/VC funds have entered the market and 2007 and 2008 saw the most funds enter, with 96 and 117 respectively. The majority of funds focus on venture, with 77% of the total universe dedicated to the stage. Only 13% are focused on infrastructure, and 10% are focused on buyout or other areas.⁴
- Venture capital has recently dominated the focus of investors raising funds in the market, though infrastructure and natural resources focused funds were more prominent in 2006 and 2007.⁴
- Clean tech PE/VC can be capital intensive which is more characteristic of growth equity. Some private clean tech companies have skipped this growth equity stage and gone from being a venture capital company right to an initial public offering (IPO).
- Clean tech PE/VC investment returns will be more influenced from cashflow growth and multiple expansion where generalist PE returns rely more on cashflow growth and dividends.
- Therefore, the market opportunity for clean tech PE/VC lies in the growth equity stage of company maturity.

³ Preqin, "The 2010 Preqin Private Equity Fund of Funds Review"

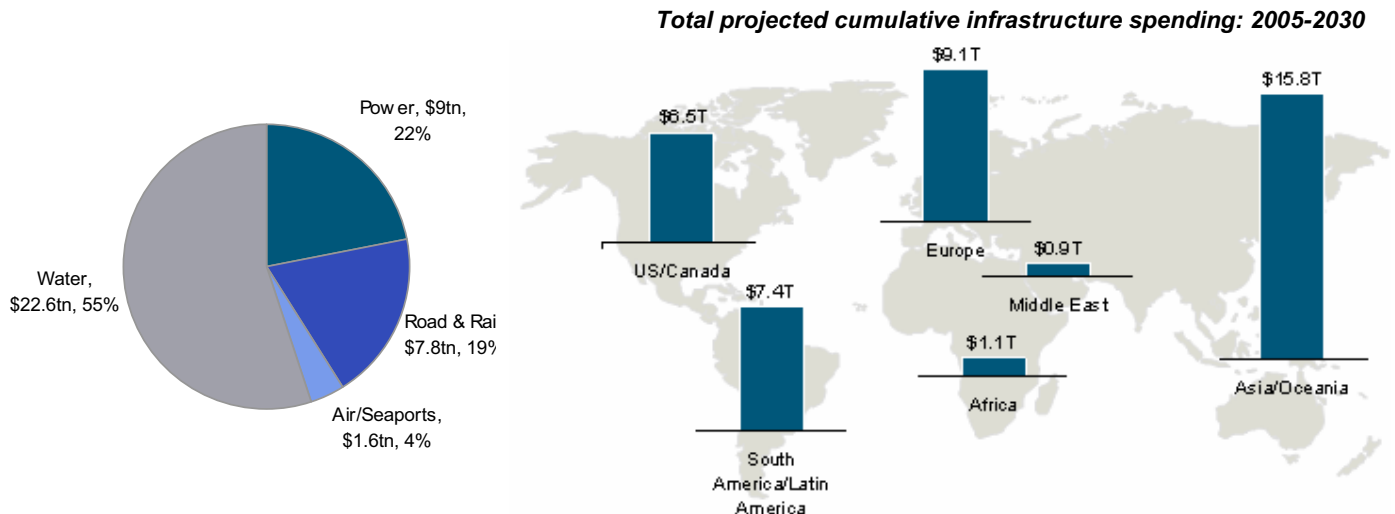
⁴ Preqin, "The 2009 Private Equity Clean tech Review"

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V. Climate Change Investment Markets: Infrastructure

Infrastructure: a \$41 trillion challenge.



Source: Booz Allen Hamilton, Global Infrastructure Partners, World Energy Outlook, OECD, Boeing, Drewry Shipping Consultants, US Department of Transportation, RREEF Research. Some of this information is a forecast and due to a variety of uncertainties, and assumptions made in our analysis, actual events or results or the actual performance of the markets covered may differ from those presented.

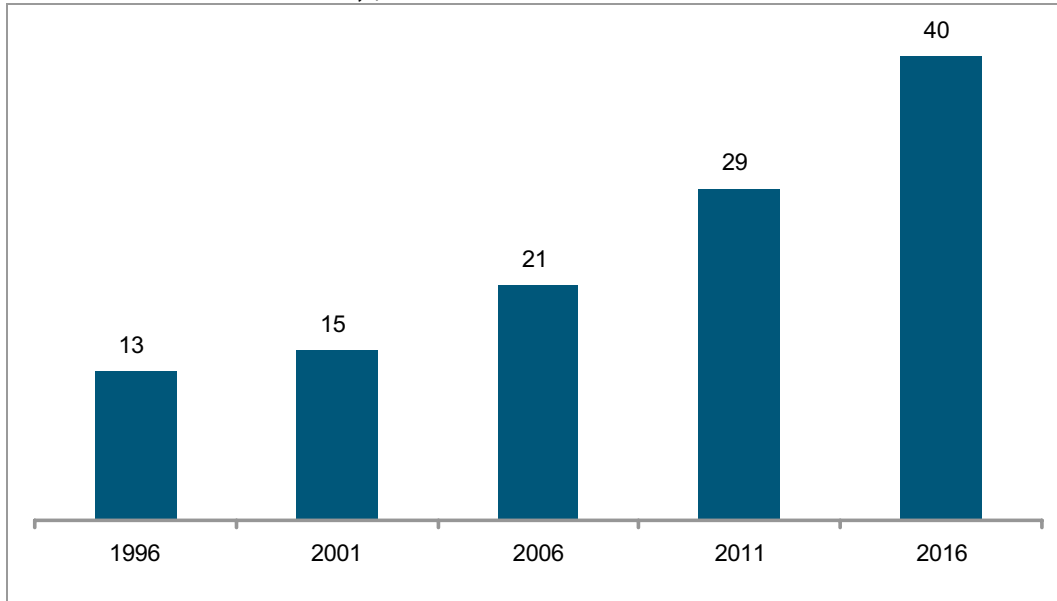
Global infrastructure demand is very large over the next decade, with strong needs across multiple geographies and sectors. Asia and Europe represent a majority of the regional need, while water dominates at a sector level.

- Demand for infrastructure is increasing due to demographic drivers, such as population growth and the 'wealth effect,' noted earlier
 - World population to increase by one-third, to exceed 8 billion by 2050
 - Most of population, over 50% to live in an urban setting
 - Deferred maintenance, mostly in energy, transport and water
- However, supply is restricted, as infrastructure projects are generally very large investments requiring long-term planning and dedication to plan, develop, and deploy.
 - Potential actors, such as municipalities, states, or countries have limited budgets
 - They are faced with social resistance, such as anti-development movements or citizens unwilling to pay for better infrastructure
- The role of public and private sector should be reassessed, with the creation of new financing structures to allow the scale-up of private investment into the asset class

V. Climate Change Investment Markets: Infrastructure

Infrastructure growth estimates.

Estimated infrastructure market size, \$ trillion



Source: RREEF Research, 2009.

Note: Some of this information is a forecast and due to a variety of uncertainties, and assumptions made in our analysis, actual events or results or the actual performance of the markets covered may differ from those presented.

Infrastructure is already a very large market and is growing rapidly. Investors will be able to access this growth through dedicated strategies and focused renewable infrastructure funds.

- The \$40 trillion projected demand for infrastructure investment will require rapid growth in the market. Infrastructure growth is projected to be robust over the next decade.
- We expect at least \$10 trillion dollars of infrastructure investment dollars to be deployed globally into a variety of projects over the next 5-10 years.
- The market size currently stands at over \$10 trillion, with growth leading to a doubling of the 2006 market by 2016.
- As emerging economies develop and developed economies need to rebuild and renovate infrastructure, governments as well as private capital will be deployed to meet growing demand for services and public goods, such as water, energy and food.
- Currently, more than \$4.56 billion and 21 funds have been raised dedicated to clean tech infrastructure. 2008 was the second highest year on record for capital raised, at \$1.26 billion, slightly higher than 2007's \$1.2 billion.⁵
- Europe leads the world in terms of both funds and capital sought. The majority of North American funds as a whole are more venture focused, while Europe is more heavily focused on infrastructure.⁵

⁵ Preqin, "The 2009 Private Equity Clean tech Review."

V. Climate Change Investment Markets: Infrastructure

Investment attributes vary by the stage of deal.

	Transaction Risk	Expected IRRs
Development stage	High Failure to fully permit	12-15%
Construction stage	Medium Cost overruns	10-12%
Operational stage	Low Management risk	8-10%

Source: RREEF Research, DBCCA analysis, 2010.

As an asset class, infrastructure has multiple points where an investor can focus – allowing access to different risk / return profiles within the larger strategy

Infrastructure investments have a long time horizon and are often considered a fixed-income substitute by investors. As such, investors should evaluate the amount of risk they seek to assume, balanced against their long-run return goals.

Development stage investments offer higher returns, but expose investors to risks associated with the early planning stages of a project. Investors typically seek 12-15% returns from this stage.

- Environmental risk (unforeseen environmental hazards; action groups) Political and social risk (opposition from pressure groups; politicians may change their mind; corruption).
- Legal and ownership risk (unknown future litigation, planning consents not granted; lease running out)

Construction stage investments offers more moderate returns, with a corresponding decrease in risks. Investors at this stage will assume the risks associated with the physical construction of the project. Returns of 10-12% are possible across this stage.

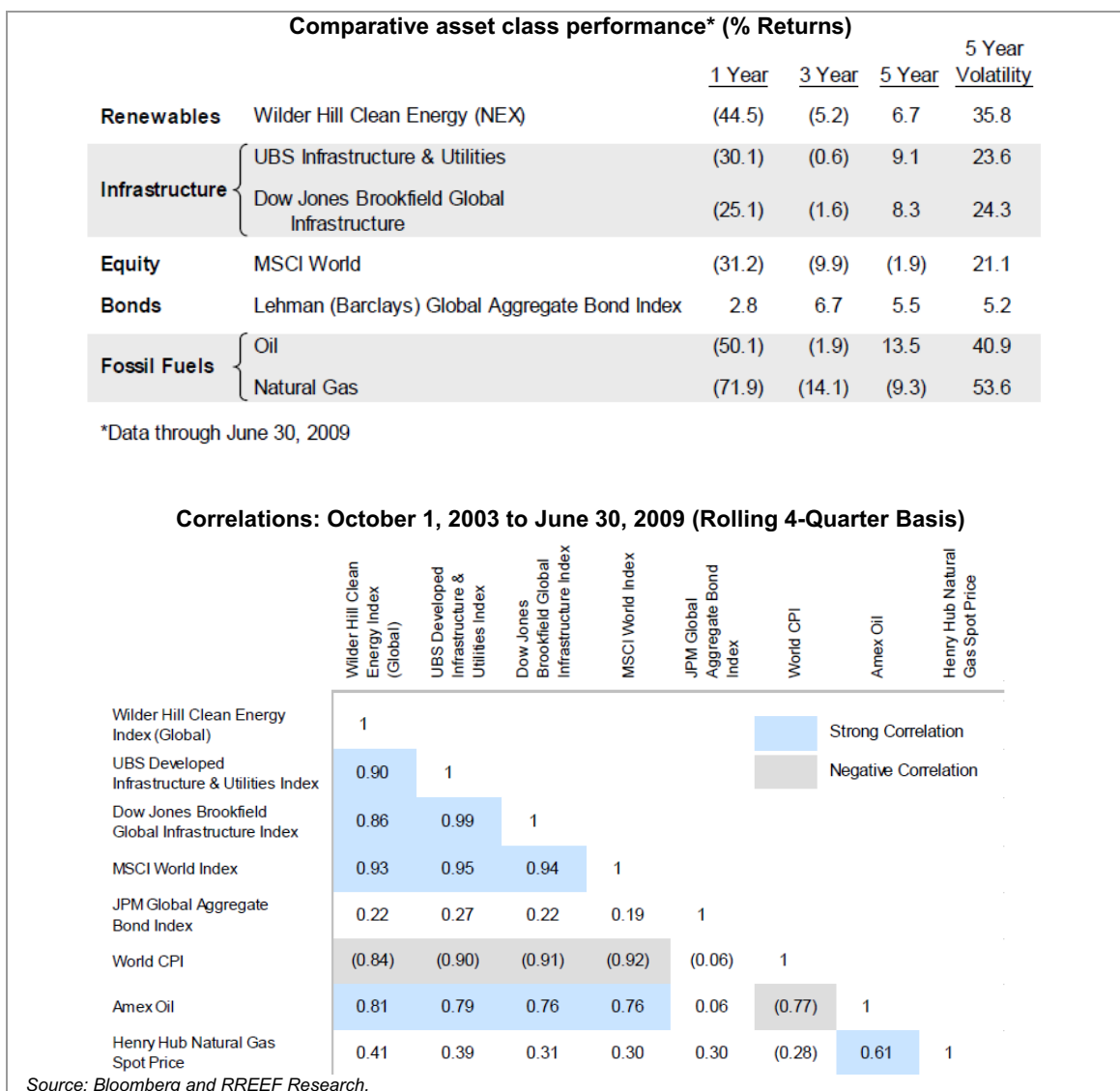
- Construction risk (e.g. the project is not completed on time; costs are higher than budgeted).
- Regulatory risk (e.g. fee rises fall behind schedule)

Operation stage investments are the lowest risk and lowest return of the spectrum. This stage generates approximately 8-10% returns.

- Operational risk (e.g. poor management, systems)
- Business risk (e.g. more competitors entering; change in consumer preferences and demand; technological advances)

V. Climate Change Investment Markets: Infrastructure

Infrastructure investments have unique performance characteristics and show various degrees of correlations with other asset classes.



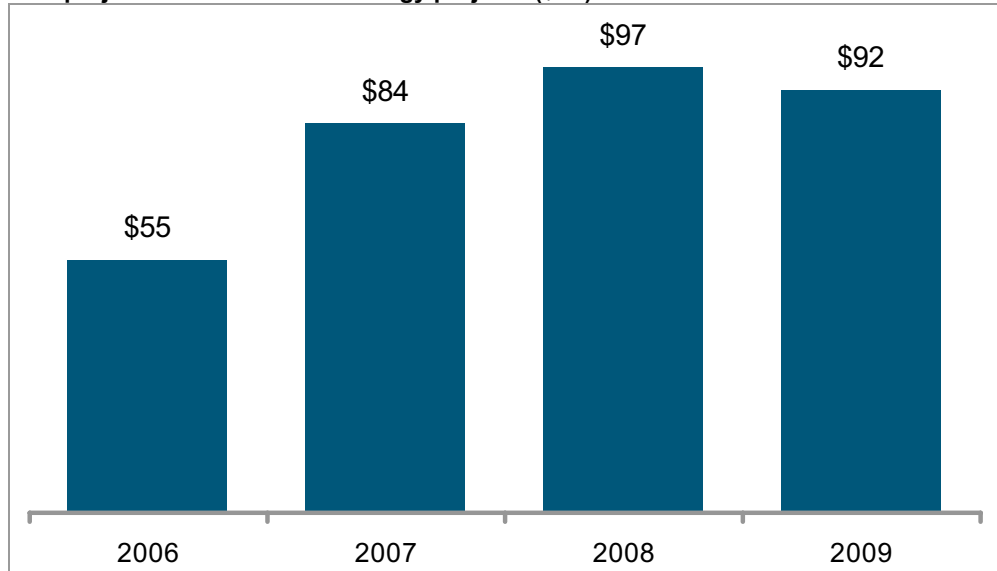
Compared to other asset classes, infrastructure has generated an attractive risk-adjusted return, with moderate correlation to the others.

- Infrastructure Investments have unique attributes and show various degrees of correlations with other asset classes.
- Specifically, infrastructure has a unique set of risk attributes, cash flow attributes and time horizon, unlike that of the public markets.

V. Climate Change Investment Markets: Infrastructure

Project finance markets.

Global new-build project finance for clean energy projects (\$bn)



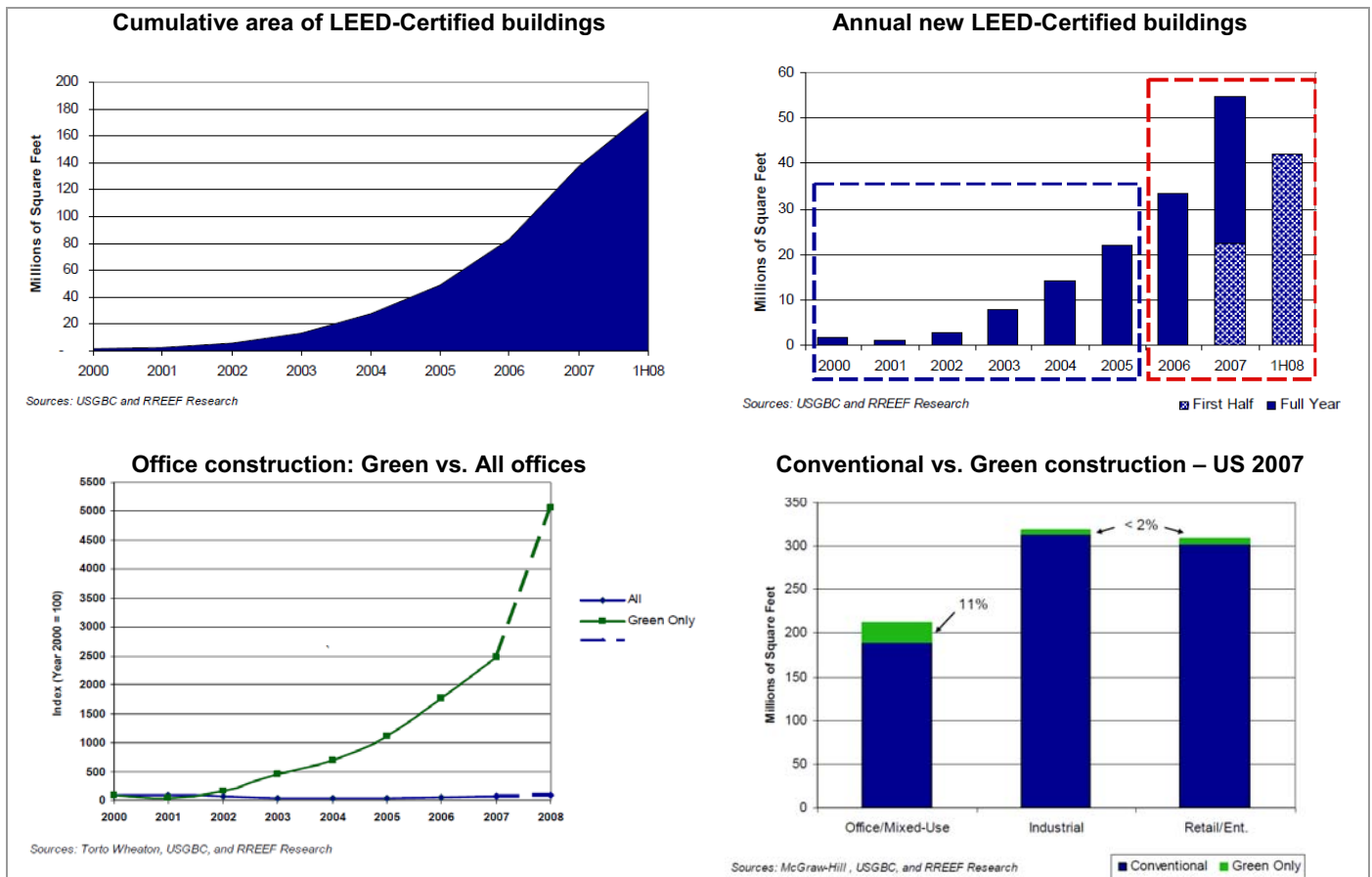
Source: New Energy Finance, 2009. Note: 2009 figure includes 4Q2009 running average.

Project finance has been the largest clean energy investment segment for new capital, and on balance, was only modestly impacted by the economic downturn relative to other asset classes. Projects in China and the UK in particular attracted large amounts of capital in 2009. In the US, the number of completed deals declined year-over-year due to the credit crisis, slowdown in the tax equity market and lagged implementation of government stimulus. Despite a drop off in 2009, European project finance was relatively more resilient due to a continuation of policy support and feed-in-tariffs.

- According to New Energy Finance data, global clean energy project finance markets saw \$92 billion of new investment in 2009, representing a 5% decrease from the previous year. The global economic downturn did take its toll on clean energy project finance markets in 2009, particularly in the first quarter of the year, when there was only \$17.4 billion of investment, representing an all-time low since mid-2007 levels. However, these markets have started to rebound globally in more recent quarters.
- Most project finance investment went towards wind farms, solar parks and biofuel plants. In particular, offshore wind projects in the UK experienced a noteworthy positive year, with the launch of the \$3 billion 1GW London Array project, while Spain decreased due to the impact of its feed-in tariff cap. In addition, China was also active in project finance markets, investing significantly in large-scale wind and solar projects, which saw \$21.8 billion and \$1.9 billion of project finance investment respectively.
- European clean energy project investment saw \$34.8 billion in 2009, representing an 18% decrease from 2008 levels (\$42.2 billion). The Americas region saw approximately \$16.3 billion in 2009, representing approximately a 50% decrease from 2008 levels (\$30.5 billion).
- Overall, governmental stimulus and policy will continue to bolster these trends and we expect a reacceleration of projects in 2010 as credit markets recover.

V. Climate Change Investment Markets: Infrastructure

Green buildings experience rapid growth at a scale requiring institutional investment.



As of the mid-2009, almost 180 million square feet of space had been LEED certified in some 1,500 projects across the US. The amount of green building area has been growing at about a 50% compounded growth rate since 2000 – about 25 times the growth rate for commercial real estate overall in this country, which averages a bit under 2% annually.

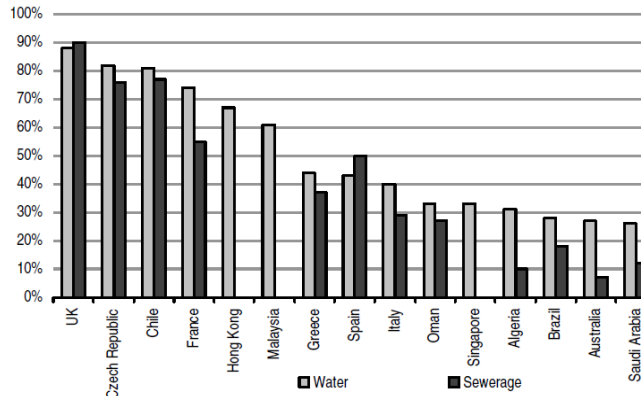
- Despite the recent moderation in overall construction trends generally, certifications of green buildings continue to accelerate. About 22 million square feet of building area was LEED certified in the first half of 2007, rising to 32 million in the second half and to 42 million square feet in the first half of 2008.
- Focusing on office construction, the amount of green office space constructed in 2008 was about 25 times the amount in 2000, and is now growing at 50 times that rate – and the volume has increased significantly every year (Figure 4, next page). At the same time, overall office construction in the nation has been flat, so there has been a decisive swing from conventional to greener construction.
- Although the amount of green building construction is growing rapidly, the overall volume is still rather small in the context of all real estate construction. Non-residential construction in the US averages about 1.5 billion square feet of building area annually, based on project contract data. By contrast, just under 50 million square feet of non-residential property was certified by the USGBC in 2007 – an impressive 50% gain over 2006, but still equal to only 3% of total construction. This share varies for different product types, but even offices, which account for the greatest share of LEED-certified buildings to date (47%), comprised only 11% of the total building area of total construction in 2007. Green-certified retail projects accounted for only 1.7% of all retail projects, and green warehouses and factories only 1.5% of industrial construction.

Source: Andrew Nelson, RREEF Research, "How Green a recession? Sustainability Prospects in the US Real Estate Industry." February 2009.

V. Climate Change Investment Markets: Infrastructure

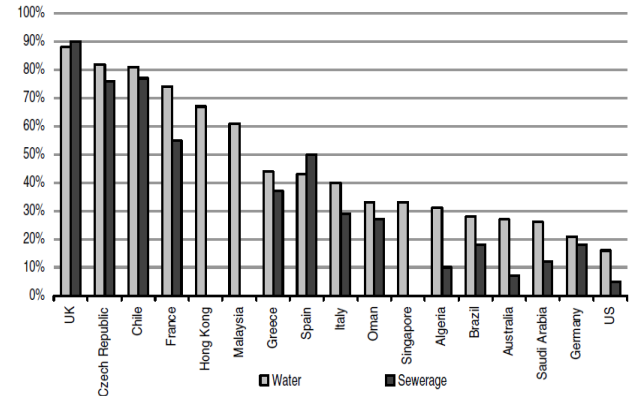
Investment trends in water are not sufficient to meet growing needs.

Water Supply: Proportion of population served by the private sector, 2008



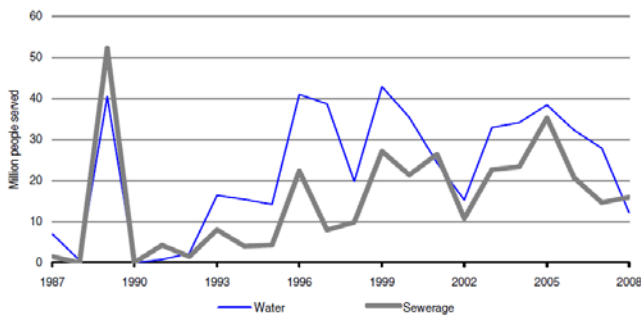
Source: Pinstent Masons Water Yearbook 2008-2009, Credit Suisse research

Proportion of water and sewerage systems owned by the private sector, 2008



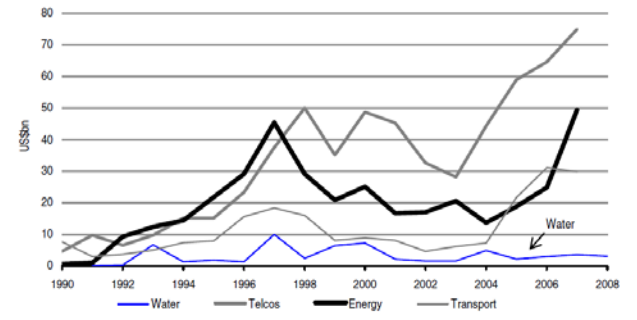
Source: Pinstent Masons Water Yearbook 2008-2009, Credit Suisse research

Global aggregate: contracts awarded to the private sector by year (million people served)



Source: Pinstent Masons Water Yearbook 2008-2009

Private sector investment in emerging markets in water, telcos, energy and transport (\$bn)



Source: World Bank PPI data, Credit Suisse research

- Water supply and sewerage services globally are still provided by public sector bodies and in areas of critical importance such as the emerging world water investment seems to be a low relative priority.
- High levels of private sector investment occur in Europe and North America, 44% and 21% respectively, whereas Japan, maintains 100% municipal management.
- Global growth in investment in the water industry needs to improve relative to the very little that has been invested.
- Pinstent Masons' data on global private sector investment in water shows a cyclical trend (investment levels dipping in 2001/2002 and again in 2008) but otherwise limited evidence of 'structural' growth.

Source: Credit Suisse Research Institute, "Water: The pressure is rising," Nov. 2009.

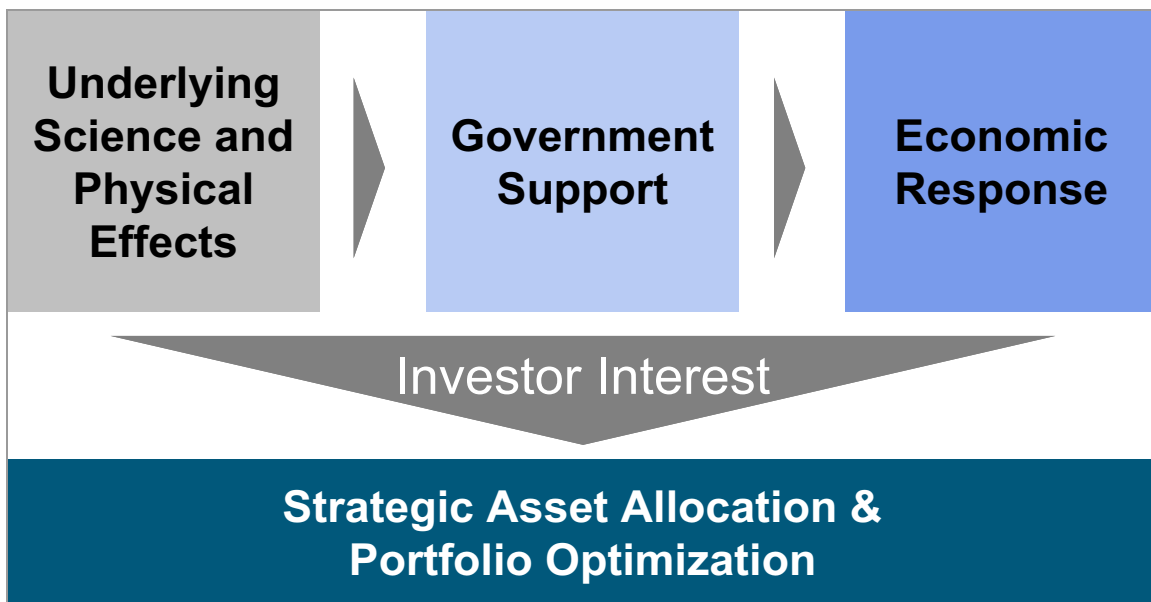
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VI. Strategic Asset Allocation

As investors, we use Strategic Asset Allocation (SAA) to optimize our portfolio in recognition of the massive scientific, governmental, and economic drivers creating the potential for alpha in climate change sectors.

Overview of climate change-related market trends and investor response



Investor Interest in climate change leads to an evaluation of its impact on portfolios.

- Investors seek to achieve a certain level of risk adjusted returns from their portfolios.
- Strategic Asset Allocation (SAA) models can be used in many different ways.
- We have chosen to take an asset liability model (ALM) approach where a targeted return is taken from the liability side and in this case, that is 6%.
- The model allows us to evaluate the addition of climate change into a portfolio and compare it to a standard portfolio.
- We analyze the probability of reaching this target return.

VI. Strategic Asset Allocation

Investment attributes vary by asset class.

	Public Equities	Bonds	Real Estate	Infrastructure	Private Equity
Nature of Asset	Common stock of operating company	Financial security	Physical property	Typically operating company dependent on control of large, physical assets	Operating company
Asset Availability	Deep volume in most markets	Deep volume in most markets	Moderate to deep volumes in most markets	Asset scarcity, many in unique, monopoly situations	Moderate volumes in most markets
Acquisition Dynamic	Efficient, on-market purchase via regulated exchanges	Efficient, on-market purchase	Competitive tenders, environmental and social issues common	Competitive tenders, regulatory, environmental, social and political issues, often held for the long run	Competitive tenders, management buy-out, negotiated trade sale, typically medium-term exit strategy
Liquidity	Very high	Very High	Moderate in most sectors	Moderate	Moderate
Income	Price appreciation, with some equities paying dividends	Fixed coupon: sensitive to interest rates	Mixture of fixed and variable interest rate and sector dependent	Once assets mature, very stable, inflation/GDP growth relative. Typically higher than bonds and core real estate	Typically dominated by capital returns
Growth	Medium	Low	Dependent upon asset characteristics; moderate to high	Dependent on asset stage: modest (late-stage) to high (early stage / development assets)	Dependent on asset characteristics, typically high
Volatility	Moderate (market factors)	Moderate (market factors)	Low/Moderate	Moderate (early stage) to low (late stage)	High (early stage) to Moderate (late stage) depending upon industry sector
Typical return expectation per annum post fees	Approximately 7-10%	Approximately 5-7%	Core: 7-9% Value Added: ~12-18% Opportunity: >18%	Mature portfolio: 7-10% Development Portfolio: >10%	Diversified portfolio >15%

Source: Pensions and Capital Stewardship Project; Labor and Worklife Program; Harvard Law School; DBCCA analysis, 2010.

Investors need to consider both the climate change related drivers of investment as well as the traditional characteristics and attributes of various asset classes.

- The nature of investments varies largely by asset class.
- Investors will have distinct risk and return requirements based on their individual needs, so consideration should be paid to long-run investment goals.
- We believe that opportunities exist in many asset classes for climate change investors. There are distinct opportunities in infrastructure, private equity / venture capital and public equity strategies, and developments in 2009 and 2010 are discussed in previous sections.

VI. Strategic Asset Allocation

Strategic asset allocation involves comparing a standard portfolio and one integrating climate change. It returns the probability of achieving performance targets, which are calculated through a statistical model which includes standard portfolio weightings.

	S.A.A. Process	Description
1	Standard Portfolio with Benchmark	Represents a 'standard' asset allocation for institutional investors. Only includes broad / traditional market indices.
2	Add Climate Change Theme	Proxies for 'focus theme' (climate change) are identified through a review of attributes, characteristics and relative market share. Proxies are then added to the specific asset class based on their share of that asset class.
3	Risk / Returns / Correlations	Standard and climate change historical returns are analyzed in order to derive a predicted return and volatility.
4	Overweight Climate Change	Applied a modest overweight allocation based on our market views to public equity, substantial overweight in infrastructure, and an aggressive overweight to private equity/venture capital.
5	Statistical Testing	Analyze the probability of achieving a target return to the portfolio based on this allocation of input factors

Theory and explanation of Strategic Asset Allocation (SAA)

- SAA starts with a traditional portfolio representing the investment allocation of a typical institutional investor. Benchmarks are included for each 'standard' asset class. These benchmarks are shown on the following slide.
- In order to test the impact of a theme, in this case climate change, the new theme must be represented across asset classes. This is done by identifying proxies or representatives for each asset class for climate change. The identification of these proxies requires evaluation of both their fit relative to climate change sectors and to attributes of the target asset class. We study their relation to traditional asset class attributes in order to better understand the investment dynamics of allocating to the new theme. In particular, we do seek to maintain a diversified portfolio with moderate to low correlation between asset classes. Climate change is not expected to provide significant diversification within asset classes, as it is primarily a driver of alpha. More discussion on identification and selection of proxies can be found in the appendix.
- We then develop a view of how the traditional asset classes and the climate change theme will perform in the future. This is done by evaluating past returns and volatility of the traditional asset classes as well as the relative performance of the climate change proxies within each asset class. We take a more conservative approach in our predicted returns (500 bps of outperformance) compared to historic returns (1200 bps of outperformance). More discussion of methodology is found in the appendix.
- Our weighting decisions are based on our views that climate change as a thematic trend will outperform the broader market. For Private Equity, our weighting to climate change sectors resulted in an overweight from 0.03% to 1%. For infrastructure, our weighting to climate change sectors resulted in an overweight from 0.61% to 2%. Public equity goes from 1.5% to 3%. This results in a total allocation of 6% to the total portfolio.
- Given all the inputs, the model then returns the probabilities of the portfolio achieving the target return levels, with a simulated mean return and volatility.

VI. Strategic Asset Allocation

We created the climate change proxies for asset allocation and calculate portfolio target weights.

Asset Class	Traditional Index	Proxy index for Climate Change Theme
Public Equity	MSCI ACWI	Aggregate index of Global Energy, Water, Agribusiness and Energy Efficiency)
Private Equity	Cambridge Private Equity	Cambridge Private Equity (+ % out-performance equal to that of climate change public equity)
Infrastructure	UBS World Infrastructure	UBS World Infrastructure (with 50 bps alpha to represent climate change out-performance)
Fixed Income	Citi World BIG	N/A

Source: DBCCA analysis, 2010.

In order to begin a strategic asset allocation for climate change investors, we evaluate and select proxies for climate change asset classes based on historical and expected performance.

- For Public markets we used the MSCI ACWI and the various climate change sector indices, such as NEX (clean energy), DXAG (agribusiness), S&P Water (water) and CRB (energy efficiency). For additional detail, see the appendix.
- For infrastructure, the UBS World Infrastructure index, with a total market cap of \$1.4 trillion was used to represent the infrastructure asset class, with a modification for expected climate change out-performance. For additional detail, see the appendix.
- At a sector level, we have not made any specific tilt towards the four major sectors of clean energy, energy efficiency, water, or agribusiness in either private equity or infrastructure. In public equities, the sectors are weighted proportionately to their market caps, reflecting our view that in the long run, these sectors are all attractive.

VI. Strategic Asset Allocation

The DBCCA view of forecasted risks and returns by asset class for climate change investors.

ASSET CLASS	Number of Periods	Historical Ann Return	Historical Ann Volatility	Predicted Ann Return	Predicted Ann Volatility
Standard Portfolio:					
MSCI ACWI	239	6.95%	15.67%	7.70%	15.73%
Cambridge Private Equity	234	13.50%	10.61%	14.11%	30.29%
UBS Infrastructure Index	47	9.29%	21.97%	16.43%	21.74%
Citi World Big (Bonds)	131	6.24%	6.07%	6.51%	6.14%
Climate Change Sectors:					
S&P Global Water	96	10.36%	17.87%	12.47%	17.81%
DAXglobal Agribusiness Index	98	23.85%	23.44%	25.46%	23.34%
WilderHill New Energy Global Innovation Index	107	8.44%	28.56%	15.55%	28.45%
CRB Research Energy Efficiency Index	83	25.87%	24.29%	23.60%	24.38%

Public Equity (MSCI ACWI), Private Equity (CAMBRIDGE PRIVATE EQUITY), Infrastructure (UBS INFRASTRUCTURE INDEX), Bonds (CITI WORLDBIG)
 Source: Bloomberg, Cambridge Associates, CRB Research, UBS, MSCI ACWI, DBCCA analysis 2010. The study is conducted over the common timeframe of 2003-2009; however with inputs from indices that range back to 2001 for the climate change sectors, and 1990 for the equity and bond indices. For illustrative purposes only.

Using Portfolio Choice, a program designed by Deutsche Asset Management, we calculated predicted annual returns and volatility for our benchmarks and Climate Change Indices.

- Historical weighted average return of 19% was realized by climate change sectors giving an excess return from climate change sectors of 12%, relative to the MSCI ACWI. Predicted weighted average returns of 21% resulted in an excess predicted weighted average return of 12%.
- Volatility for public market climate change sectors was similar, but slightly higher to that of the MSCI ACWI benchmark.
- Private equity historically showed low volatility, but our view is that private equity will have a higher volatility going forward.
- Volatility for the public infrastructure index is higher than we would expect for investments in private infrastructure funds.

Correlation matrix: Investing across asset classes can be used to diversify risk.

	MSCI ACWI	Cambridge PE	UBS Infrastructure	Citi World Big	Water	DXAG	NEX	CRB Energy Efficiency
MSCI ACWI	1.00							
Cambridge PE	0.49	1.00						
UBS Infrastructure	0.93	0.45	1.00					
Citi World Big	0.35	-0.07	0.39	1.00				
Water	0.95	0.51	0.90	0.29	1.00			
DXAG	0.80	0.50	0.73	0.35	0.76	1.00		
NEX	0.93	0.47	0.87	0.34	0.90	0.84	1.00	
CRB Energy Efficiency	0.93	0.47	0.84	0.25	0.91	0.73	0.90	1.00

Source: Bloomberg, Cambridge Associates, CRB Research, UBS, MSCI, DBCCA analysis 2010.

Climate change sectors are highly correlated to each other in public equity markets; while private equity shows moderate correlation and bonds have very low correlation to the equity markets. The modest correlation to private equity and infrastructure can have diversification benefit in portfolio construction.

- An important component of portfolio construction is asset class as well as sector diversification. There was modest correlation between private equity and public equity (roughly 50%), yet very low and negative correlation to bonds.
- We use the infrastructure index as representative of the asset class, but in order to determine a risk return profile we used a listed index. Therefore, the correlations to the listed market are fairly high. In our allocation model, we assume infrastructure investing will be done into infrastructure funds that show lower correlation to the equity markets.
- The Climate Change sectors themselves, represented by listed equity indices, are all highly correlated.

VI. Strategic Asset Allocation

Results for climate change sector allocations: We determined the probability of achieving our target return with overweighting to climate change.

Target Portfolio Return:	Standard Portfolio without Climate Change 6.00%	Portfolio Using Historical Climate Change Returns 6.00%	Portfolio Using Forecast Climate Change Returns 6.00%
Asset Weights			
Public Equity	36.97%	34.75%	34.75%
Private Equity	3.50%	3.29%	3.29%
Infrastructure	15.21%	14.30%	14.30%
Bonds	44.32%	41.66%	41.66%
Climate Change Public Equity (1200 bps)	-	3.00%	-
Climate Change Public Equity (500 bps)	-	-	3.00%
Climate Change Private Equity (1200 bps)	-	1.00%	-
Climate Change Private Equity (500 bps)	-	-	1.00%
Climate Change Infrastructure (50 bps)	-	2.00%	2.00%
Statistical Tests			
Probability of Outperforming Target Return	57.94%	59.58%	58.59%
Simulated Mean Return	8.73%	9.39%	9.11%
Simulated Volatility	10.76%	11.30%	11.30%

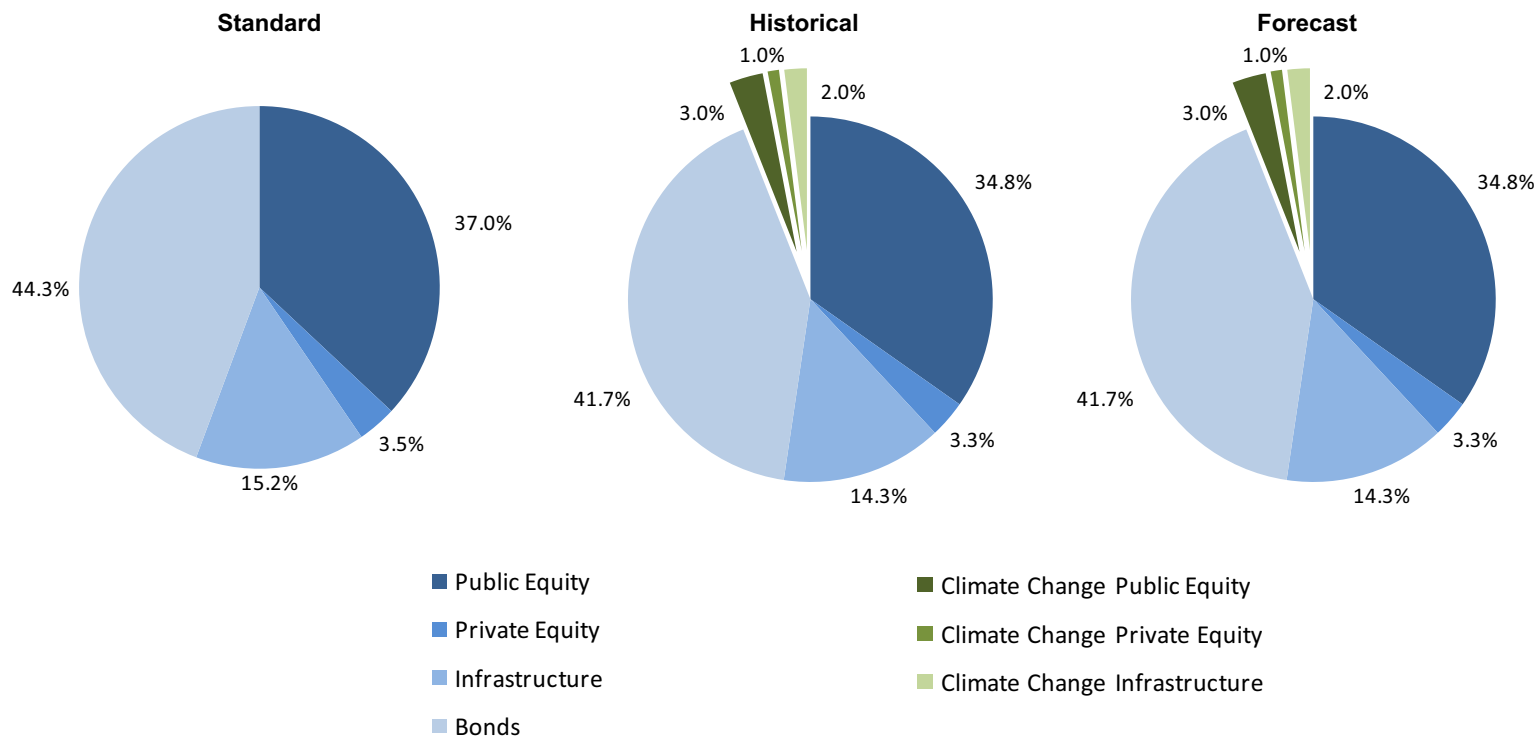
Public Equity (MSCI ACWI), Private Equity (CAMBRIDGE PRIVATE EQUITY), Infrastructure (UBS INFRASTRUCTURE INDEX), Bonds (CITI WORLDBIG)
 Source: DBCCA analysis, 2010. The study is conducted over the common timeframe of 2003-2009; however with inputs from indices that range back to 2001 for the climate change sectors, and 1990 for the equity and bond indices. For illustrative purposes only. Please note that simulated results have inherent limitations. The results do not represent results of actual trading using client assets, but were obtained by the retroactive application of constraint assumptions to model allocations as described herein. No representation is being made that any account will achieve profits or losses similar to those shown. These simulated results do not reflect the deduction of investment advisory fees. A client's return will be reduced by advisory fees and any other expenses that may be incurred in the management of its investment advisory account. Past performance is not guarantee of future results.

Results of strategic asset allocation review

- We have now pulled together all the inputs that we have discussed so far.
- We have identified a target return of 6%.
- Using the results of the model, we can look at the probability of achieving this target with the addition of climate change.
- The weights of the asset classes as discussed are adjusted to keep the asset classes in the same proportion.
- We then look at the statistical analysis generated by the model using the weights, returns, volatility and correlations.
- The probability of achieving the target return increases in the portfolio integrating climate change.
- Based on an analysis using historical data, the excess return from public equity climate change is 12%. We have also provided a set of additional results where we assumed the excess return (going forward) from public equity climate change is a more conservative 5%. For private equity climate change, we have assumed the excess return matches that of public equity climate change, and for infrastructure, we add a very minor premium to climate change of 0.5%.

VI. Strategic Asset Allocation

A portfolio incorporating climate change sectors offers a higher probability of achieving the target return.



Target Portfolio Return:	Standard Portfolio without Climate Change	Portfolio Using Historical Climate Change Returns	Portfolio Using Forecast Climate Change Returns
	6.00%	6.00%	6.00%
Statistical Tests			
Probability of Outperforming Target Return	57.94%	59.58%	58.59%
Simulated Mean Return	8.73%	9.39%	9.11%
Simulated Volatility	10.76%	11.30%	11.30%

Source: DBCCA analysis, 2010. For illustrative purposes only. Please note that simulated results have inherent limitations. The results do not represent results of actual trading using client assets, but were obtained by the retroactive application of constraint assumptions to model allocations as described herein. No representation is being made that any account will achieve profits or losses similar to those shown. These simulated results do not reflect the deduction of investment advisory fees. A client's return will be reduced by advisory fees and any other expenses that may be incurred in the management of its investment advisory account. Past performance is not guarantee of future results.

Conclusions: Allocating to climate change offers investors a greater probability of achieving the target return.

- We use an aggressive overweight of 6% allocated to climate change sectors, compared to a 2% global market capitalization benchmark. Using historical returns of 19% from climate change sectors, an excess of 12% over the benchmark, applying them to the total portfolio yielded an extra 0.7% of return to the total portfolio.
- On an ongoing basis, a more conservative assumption would be a 5% excess return from climate change sectors, which would give an additional 0.4% to the total portfolio.
- We did this by selecting a specific return target of 6% for the portfolio, which allowed us to analyze the probability of reaching that target.

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Strategic Asset Allocation Appendix

Rationale for Climate Change Public Equity Proxy

- **Rationale of returns:** We use an Aggregate index of Global Energy, Water, Agribusiness and Energy Efficiency indices to represent the universe of climate change related public equities. As mentioned earlier, these indices have out-performed the MSCI ACWI over a 3 year and 1 year time frame, as well as from the market bottom. Its volatility is also representative of the public markets and has shown significant correlation to other broad indices. However, we believe the secular climate change theme will continue to out-perform as the sector is supported by other factors, such as government support, emerging technologies, corporate investment and investor interest in the sector.
- **Risks:** The public markets for climate change are subject to the same pressures such as volatility and major market moves. In particular for Climate Change is potentially the sell-off of broad markets in general that include equities under-pinning climate indices. Additional risk may include the notion that markets are forward thinking and that current prices already reflect government stimulus dollars. In our study risk was estimated using market data.
- **Rationale for allocation in the portfolio:** The MSCI ACWI represents a market capitalization of approximately \$24.3 trillion (as of November 2009). Our aggregate index for Climate Change index market capitalization (weighted by market capitalization of the four climate change sectors) represents roughly \$1.1 trillion, a 4% relative weighting to our Aggregate Climate Change index. Therefore, in our overall allocation to equity of 37%, 4% of that would be neutrally weighted to 1.5%. Again, we believe that Climate Change Sectors, will continue to grow as a percentage of total market with significant alpha being generated by those companies involved in the low-carbon economy transition.

Rationale for Climate Change Private Equity Proxy

- **Rationale of returns:** We use the Cambridge Associates annualized pooled returns as a basis for our Private Equity allocation. We add 5% to the historical returns for our climate change targeted returns. Other studies show that PE/VC managers have achieved out sized returns in the clean tech space. We are conservative in our estimate because there is a difference in the PE/VC space for clean energy. As we described in our Investing in Climate Change 2009 whitepaper, the clean energy private equity space is much further down the capital curve as compared to the traditional Private equity industry. Traditional Private Equity is often characterized by middle market companies being infused with additional capital or large Buy-Out transactions using considerable leverage. Most of the Clean tech PE funds that were analyzed in the studies were late stage venture capital, where technologies are proven, but not yet fully deployed at a commercial scale. However, we believe this to be changing as more experienced private equity managers are getting into the space, i.e. those transactors that have spent 25 years realizing natural gas projects, as well as current clean tech investors gaining more experience with the asset class. Additionally, several studies have been conducted on Clean tech private equity venture capital fund managers with very promising results.
- **Risks:** Private equity (PE) and venture capital (VC) have other attributes that present investment risk. Private equity can have a much longer time horizon of investment (e.g. 5-10 years), and while having lower volatility than the broad equity markets, there is difficulty in effectively pricing the sales of companies. Other risks include investment stages (capital allocated, committed, drawn-down, invested, distributed), different valuation methodologies (not market priced, less frequent), return measurement (internal rate of return, vintage year returns instead of time-weighted, annual returns), J-curve effect (negative cash flows in the early years), institutional set-up (GP and LPs) and compensation structure. Private equity in the climate change universe has additional specific risks because of the complexities surrounding clean energy regulation, market access, technology and commercialization risks, finance and management, commodity risk management, and taxation require a sophisticated understanding in order to properly manage investment risk. For the model, historical quantitative risk data is not available and therefore we use a more conservative estimate of Alpha. Private equity historically showed low volatility, but our view is that private equity will have higher volatility resulting in a higher predicted volatility.

Strategic Asset Allocation Appendix

- **Rationale for allocation in the portfolio:** Prequin estimates that \$16.4 billion was deployed into global Clean tech private equity funds over the period of 2004-1q 2009, compared to the \$2.3 trillion of global assets under management (as of June 2009), representing 1% of total PE AUM. If we consider our allocation of Private Equity to be 3.5%, 1% allocated to Climate change investments of total PE represents .04% allocation of total portfolio. We believe this is significantly underweighted and would allocate to at least 1% for Climate Change within the Private Equity asset class. Compared to Cambridge Associates LLC estimates of PE/VC performance, the return studies for clean tech PE/VC seem to show similar, if not better performance. Clean tech PE and Venture Capital showed returns of greater than 20% in several different studies in the 5-7 year range. Overall industry performance yielded 9.92% and 7.56 % for five and ten year periods respectively for Private Equity and 5.7% and 14.4% for the five and ten years respectively for Venture Capital (Pooled-end-to-end returns, Cambridge Associates LLC. As of June 30, 2009). While, the sector remains nascent, the experience of the last few years and the adoption of clean tech investing by mainstream PE investors, we expect managers to perform at least as well as experienced managers in other sectors.

Rationale for Climate Change Infrastructure Proxy

- **Rationale of returns:** We considered our proxy for the return characteristics of the asset class. We posit that the UBS Infrastructure Index reflects how this asset class has performed, although we recognize that the listed market is subject to other factors that differ from true private project finance infrastructure investments. Our view of infrastructure is that it is on a project by project basis and will depend on the maturity of the project, as to how the “equity” will perform as well as other factors such as leverage, quality of counterparty, etc. We adjust the index historical performance up by 50 bps to reflect our view that infrastructure projects should achieve an average return within the 12-15% range (RREEF, 2009 estimates). Clean energy projects are likely to out-perform the infrastructure asset class as a whole because of public policy support which translate into projects backed by long-term power purchase agreements that escalate at a premium to the average power prices.
- **Risks:** Infrastructure investing includes many risks. These risks fall into various categories: Construction risk (e.g. the project is not completed on time; costs are higher than budgeted), Operational risk (e.g. poor management, systems), Business risk (e.g. more competitors entering; change in consumer preferences and demand; technological advances), leverage risk (typical leverage of 30-90%, resulting in a high exposure to interest rate risk; refinancing risk with higher inflation and interest rates; downgrade risk), Legal and ownership risk (unknown future litigation, planning consents not granted; lease running out), regulatory risk (e.g. fee rises fall behind schedule), environmental risk (unforeseen environmental hazards; action groups), political and social risk (opposition from pressure groups; politicians may change their mind; corruption). For the model, historical quantitative risk data is not available and therefore we use a more conservative estimate of Alpha. While historical volatility for the infrastructure index is higher than we would expect for investments in private infrastructure funds, we did not adjust the volatility in our predicted volatility.
- **Rationale for allocation in the portfolio:** In order to estimate the allocation of infrastructure in the portfolio for climate change investors, we used an estimate of the growth of global infrastructure projects through 2016. Using our base portfolio as a guide, and the estimate of \$10 Trillion dollars to be deployed into infrastructure, results in a 15% target allocation to infrastructure, which include infrastructure assets such as power, water, air/seaports and roads. Prequin estimates that 4 % of infrastructure funds raised were clean tech oriented, so of the total 15 % allocation to real assets, 4 % of that should be allocated to climate change infrastructure resulting in a 1 % climate change allocation. We are more bullish due to the fuel shifting that is occurring in the energy markets and view an overweight to 2 % for the climate change allocation in infrastructure.

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I-015507-1.3