Equity Quantitative Research
Global

HSBC Climate Change

HSBC Global Research

# Climate Change – September 2010 annual index review

China Cleans Up

- **China's climate revenues emerge into global top 10 for the first time**
- **Global climate-related revenues in 2009 exceeded USD500bn for a second year in succession despite global economic slowdown**
- **With strong earnings growth forecast of 26% for 2011 and continued stimulus support for the sector we reiterate our preference for Energy Efficiency & Energy Management**

## China emerges as global top 10 climate player

One of the most notable developments of the past year has been the emergence of China as one of the world's top 10 countries for climate revenues. This is testimony to the country's rapidly growing engagement in climate-related businesses, which is being powered by a combination of private and public sector investment.

Private sector climate-related investment in China, which has grown 30-fold since 2004, coupled with strong political leadership and focused climate stimulus spend, is now set to propel China to the forefront of developments in the emerging low carbon economy which we believe will ultimately feed into the future growth of its own economy.

## HSBC Climate Change Indices

The scheduled third annual review of the HSBC Climate Change Index has now been concluded and, as in previous years, the annual review represents an opportunity to re-examine the efficacy of the various climate themes in light of the current best understanding of the underlying science, the evolving regulatory landscape, climate-related revenues as well as investability criteria. The conclusions of the review are that the current investable themes will be maintained, the minimum market capitalisation threshold remains unchanged at USD400m and the HSBC Climate Change Index will be composed of 367 constituents. There will be 35 additions to and 36 deletions to the benchmark index. All changes will be effective as of the close of business on 17 September 2010.

**13 September 2010**

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# HSBC's Climate Service

HSBC Global Research has developed a three-pronged response to the investment challenge of climate change

- Quantitative: providing solutions enabling investors to incorporate climate change into their investment decisions
- Macro: conducting in-depth research into the scientific, policy and market dimensions of climate change
- Equity: identifying stocks from our global coverage that offer climate investment opportunities

## Quantitative Research – the Climate Change Indices & Toolkit

In September 2007, HSBC's Quantitative Research team launched its family of Climate Change Indices offering investors with liquid exposure to leading companies providing solutions. The indices offer investors a variety of ways of responding to the investment challenge at global, thematic and regional levels drawing from a global opportunity set of over 1,000 equities.

## Macro Research – the Climate Change Centre of Excellence

In October 2007, the Climate Change Centre of Excellence was established as a focal point within HSBC to identify the long-term commercial implications of the issue. Its research focuses on the Macro dimension, investigating the scientific foundations of climate change, geographical vulnerabilities, global policy frameworks and long-term market prospects

## Equity Research – the Climate Equity Opportunity list

With the publication of *Green is the New Black*, in March 2007, HSBC Equity Research has been steadily expanding its coverage of stocks that derive material revenue streams from alternative energy solutions. HSBC has now identified around 90 stocks that have more than 20% of their revenues from the broader climate economy, notably energy efficiency, solar, water and wind. The bulk of the coverage is through the Clean Energy team, plus selected opportunities in Industrials.

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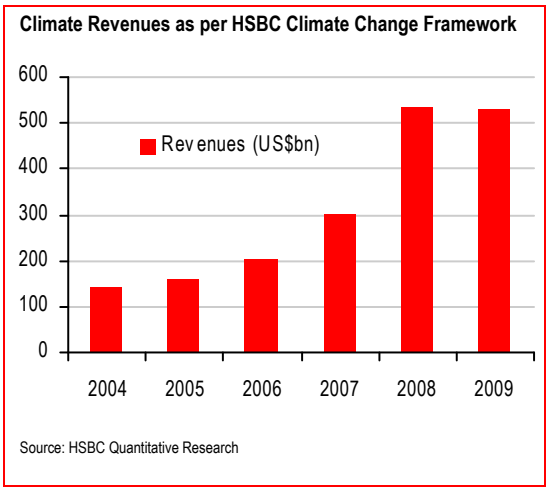
# China breaks through into leading countries for climate revenues

- China's climate revenues emerge into global top 10
- Global climate revenues reach USD530bn in 2009
- Climate revenues now larger than the wireless telecom sector

## Global climate revenues

Despite concerns over the risks that governments potentially may retreat from their pledges to deliver emission reductions and continuing uncertainty surrounding the withdrawal of regulatory incentives in key markets, global climate revenues have held up remarkably well and in 2009 stood at USD530bn for listed companies[#].

Our analysis suggests that despite the global economic slowdown, companies that have been engaged in producing goods, products and services which address the issues of climate change, as defined by the HSBC Climate Change Index, have experienced a very small – less than 0.9% – decline in revenues in 2009. In contrast, the revenues of the approximately 2400 companies in the MSCI ACWI fell 3%. Climate-related revenues have clearly held up better than those across the wider economy, as companies in key industries, which we have identified as being critical to the emerging low carbon economy, continue to focus on growing climate revenues, relative to their other businesses.




[#] *Climate revenues are calculated by summing all the reported revenues that each of the companies within the HSBC Climate Change Index derive from any one of the 18 investable climate themes.*

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## Regional climate revenues

Asia Pacific ex-Japan has come into its own over the last year, registering some of the strongest growth in revenues across two specific sectors of the climate economy: Energy Efficiency & Energy Management (EEEM), and Low Carbon Energy production (LCEP), which includes renewables.

**Climate revenue growth 2008/ 9 – largest climate change regions**

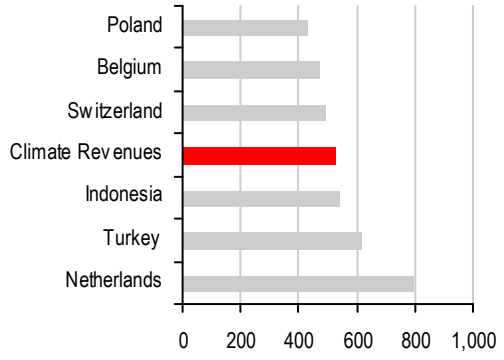
| Sector | Asia Pacific ex Japan | Europe | North America |
|---|---|---|---|
| CF | - | 48% | - |
| EEEM | 75% | 2% | -5% |
| LCEP | 8% | 5% | -7% |
| WWPC | -15% | 10% | 10% |

Source: HSBC Quantitative Research

Indeed, revenues in Energy Efficiency and Energy Management saw a remarkable 75% rise in Asia in 2009, albeit from a small base. However, Europe is the only region to have seen revenue growth across all four sectors of the climate economy, including Water, Waste and Pollution Control (WWPC) and Climate Finance (CF).

## Climate revenues compared

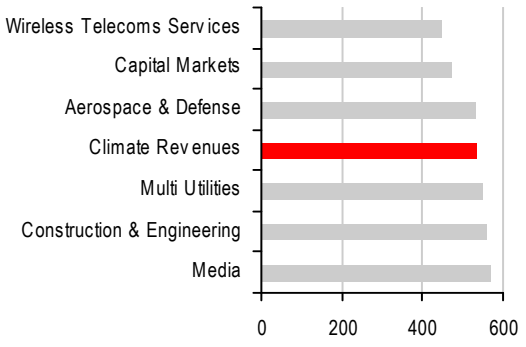
**Climate revenues vs Country GDP for 2009 (USD bn)**




Source: HSBC Quantitative Research, IMF

At USD530bn in revenues, the size of the climate economy is now comparable to the GDP of Switzerland, and in terms of industrial sectors it is now larger than wireless telecom services, as represented by the MSCI ACWI index.

**Climate vs Global Sector Revenues for 2009 (USD bn)**




Source: HSBC Quantitative Research, MSCI ACWI

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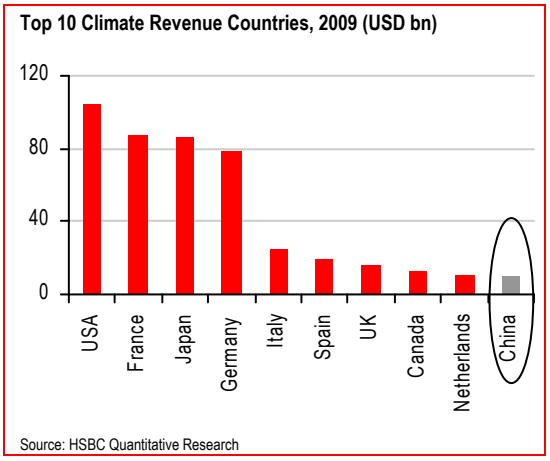
## Climate revenues by country

After the US, in 2009 France ranked second globally in terms of climate revenues, having displaced Japan into third place on the back of an 18% decline in climate revenues.



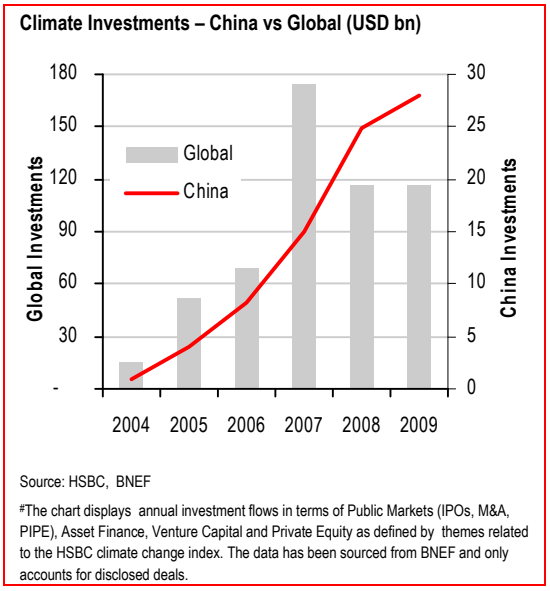

The principal reason for Japan's decline can be traced back to large falls in revenues across its Low Carbon Energy, and its Energy Efficiency & Energy Management sectors – both having witnessed drops of between 20% and 21%.

This is not entirely surprising on the basis it is now two years since governments across the globe, including Japan, announced their green stimulus plans, and our estimates suggest Japan has so far managed to disburse only 21% of the USD43.3bn pledged. Add to this the uncertainty that has been created in the minds of investors following the scrapping, earlier this year, of Japan's draft law on emissions trading. Although the climate-protection draft law has since been revived and there are now plans to commence emissions trading in 2013, investors are still waiting for details on its plans for carbon emission caps. The uncertainty that has been created by all of this has not resulted in a particularly supportive backdrop for the climate sector in Japan.

## China cleans up

The most notable development of all is the emergence of China as a top 10 country for climate revenues. 2009 marks the first year that China has broken into the global top 10 largest climate revenue generating countries and its emergence, in many ways, is reflective of the country's rapidly growing engagement in climate change which is being powered by a strong combination of private and public sector investment.

Since 2004, new climate-related investments[#] in China have risen more than 30 fold. This dwarfs the figure for global climate investments which have seen a little more than a 7 fold rise over the same period.




In fact, climate-related investment in China has risen every year since 2004, with investments growing at a CAGR of 99%. This has occurred despite global investment in the sector having peaked in 2007 and not yet recovered anywhere near their all-time highs. The extraordinary growth in investment in China has been fuelled largely through asset finance deals in Wind and Solar.

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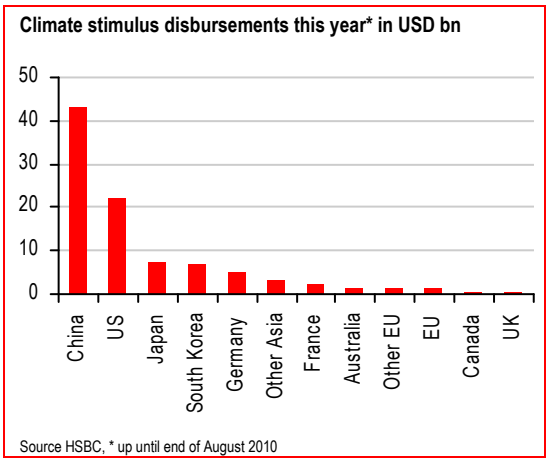
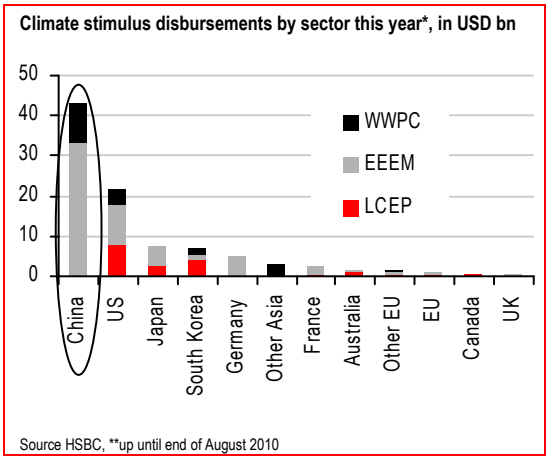
In 2009, when global investment in the climate sector remained largely flat, China experienced a 12.3% rise in investments year-on-year, and by the end of the year, China accounted for over 24% of total global investment into the sector, having represented only 6% of the total in 2004.
As concerns over the strength and sustainability of the global recovery have persisted through the course of 2010, additional new investment in the climate sector has flailed, yet China continues to enjoy strong investment flows. The total amount of new equity investments raised on the public markets in China in 1H 2010 was up 52% over the same period in 2009 and despite facing head winds elsewhere in the world, investment in Wind also continues to grow strongly. Likewise, the Chinese Venture Capital and Private Equity sector has seen a 103% rise in investment between 1H 2009 and 1H 2010 with Energy Efficiency and Energy Management leading. In addition to the significant investment and activity in the private sector, the economic opportunity presented by a changing climate is also an area of strategic focus for the Chinese government. When we map its Climate stimulus pledges to the Climate themes and sectors within the HSBC Climate Index, we estimate the Chinese government has pledged a total of USD114bn to climate themes. This figure is the largest amount pledged by any country and we believe China has already disbursed USD45.9bn of this in 2009 and has been very busy in 2010, having already spent USD42.9bn which again happens to be the largest amount spent by any country year to date*.




In terms of climate stimulus spend, China leads the pack, having already disbursed over 70% of the funds it pledged two years ago. Its focus has now turned to Energy Efficiency and Energy Management which represents one of China's top energy priorities, as it seeks to reduce energy use and cut demand. Stimulus spend for this sector has totalled more than 77% of all disbursements so far this year.




We believe with continued strong investment flow from the private sector, coupled with political leadership, China is now well positioned to move to the forefront of developments in the emerging low carbon economy, which should ultimately feed into the future growth of its own economy.

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Looking back a few years, it is now easy to see that the Renewable Energy Law of 2005 was of key significance. Among other things this was designed to promote the development and use of renewable energy, improve energy security and the energy infrastructure as well as diversify China's supply of energy sources.

China's rapid emergence as a global top 10 climate revenue country is the strongest evidence yet it has remained true to these aspirations and is planning ahead. It has already been unequivocal in its ambition to have 15% of total energy consumption delivered through renewables by 2020. Much of this, we expect, will be delivered through additional stimulus pledges which will likely also include plans to promote energy efficiency and nuclear power.

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# Annual review of HSBC Climate Change Index and investment themes

- Climate Index constituents now stand at 367
- Investable themes maintained at 18
- Index market cap now at 5% of global listed market cap

## Introduction

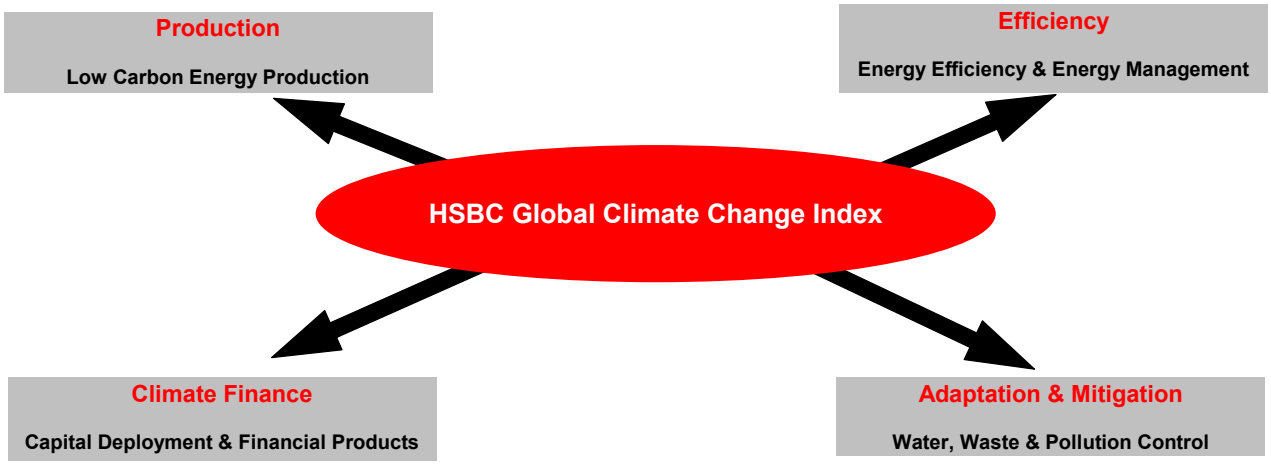
The third annual review of the HSBC Climate Change index has now been concluded and, as in previous years, the annual review represents an opportunity to re-examine the efficacy of the various climate themes in light of the current best understanding of the underlying science, the evolving regulatory landscape, climate-related revenues as well as investability criteria.

## HSBC Climate Change Index

Having given due consideration to each of the criteria, the index will continue to reflect and represent the following four principal sectors:

- Low Carbon Energy Production
- Energy Efficiency and Energy Management
- Water, Waste and Pollution Control
- Climate Finance

Climate Change Investment Opportunities as defined by HSBC Equity Quantitative Research Group




Source: HSBC Quantitative Research

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# Annual index review

Following the annual review, the index will continue to reflect 18 broad investment themes, made up as follows: Solar, Wind, Hydro/Geothermal/Marine, Diversified Renewables, Gas, Nuclear, Bio-Energy, Integrated Power, Buildings Efficiency, Industrial Solutions, Transport Efficiency, Fuelcells, Energy Storage, Water, Waste, Pollution Control, Investment Companies and Carbon Trading.

The resulting structure of the HSBC Climate Change index and the representation of the various investable sectors and themes, following the annual review, is as depicted in the schematic overleaf.

## Climate sub-themes

As an emissions reduction solution, Bio-Energy continues to reflect a broad-based investment theme which encapsulates a spectrum of sub-themes including biomass, bio-diesel, bio-fuels and second generation cellulosic feedstock. However in light of the emerging and significant variations and uncertainty in the scientific estimates of the potential climate-related benefits of bio-diesel which is produced from palm oil, when both the direct and indirect impacts of land use change are accounted for, we no longer consider palm oil as an investable sub-theme.

## Climate themes – watchlist

### Carbon capture and storage

In recent years, and more crucially over the last two, Carbon Capture and Storage (CCS) has increasingly been mooted as yet another technological innovation in the fight against climate change. While CCS does indeed possess the scientific credentials for delivering emission reductions, there still remain a large number of technical, regulatory, legal and commercial hurdles to overcome before it is considered an investable theme, from a public markets perspective. CCS does not yet therefore make it into the HSBC climate change index, but will continue to remain on our watch list of potential new themes.

### Forestry and agriculture

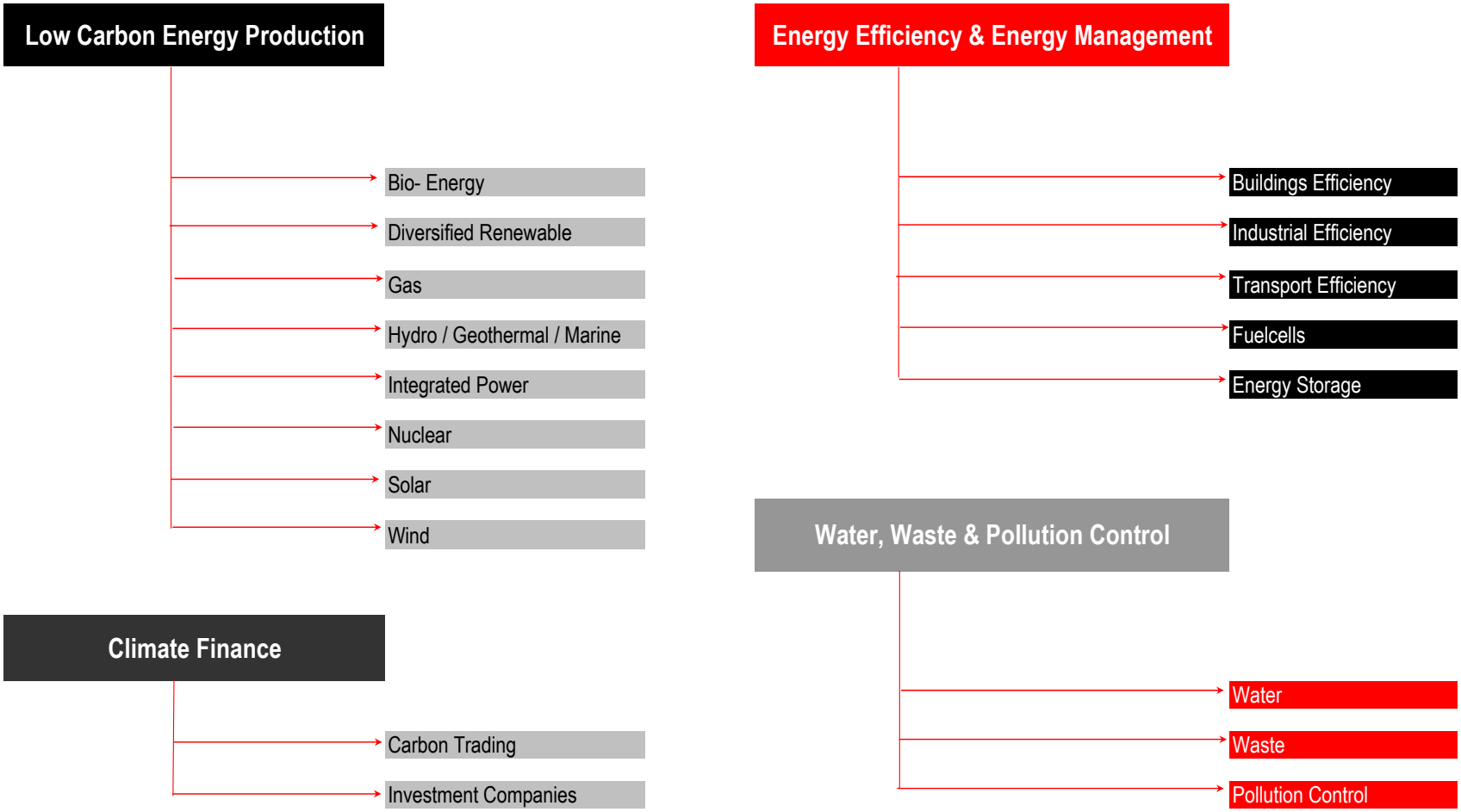
Deforestation is estimated[#] to account for approximately 17% of global greenhouse gases. This is larger than emissions from the transportation sector and the need therefore to address the issues of deforestation are just as important as is the need to decarbonise energy.

In this respect, forests have an important role to play both as stores of carbon and in terms of potential emissions saved.

One of the many attractions of forest protection is that no new technology is required to achieve significant reductions in emissions nevertheless our work suggests that we are still some way off from seeing an appropriate and operational regulatory and financing framework for this to work. As a result, Forestry and Agriculture do not yet meet the necessary criteria for inclusion in the index and will therefore continue to remain on our watchlist.

[#]*House of Commons Environmental Audit Committee, 'Reducing greenhouse gas emissions from deforestation: No hope without forests', Fifth Report of Session 2008–09*

HSBC's Macro Quantitative Investment Framework




Source: HSBC Quantitative Research

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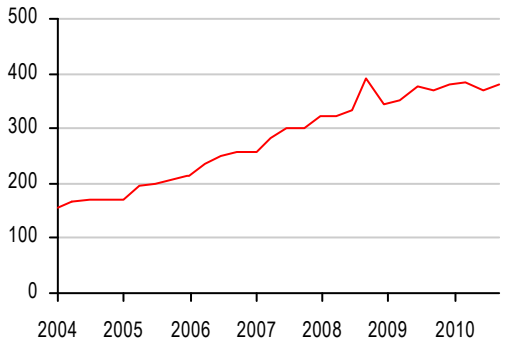
## Rising global climate engagement

Over the past year and despite a number of key countries wavering on their commitments towards addressing the issues of climate change, the number of companies engaged in providing climate-related goods, products and services continues to grow and now stands at 367, which represents a 140% rise since 2004.

**Constituent growth in the HSBC Climate Change Index**

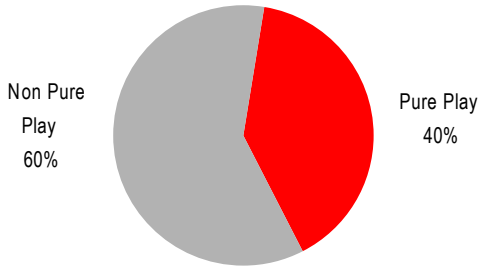



Source: HSBC Quantitative Research

## Pure play vs non-pure play

Along with the continued growth in the number of companies that have actively been increasing their engagement in climate-related businesses, there has also been a strong and rising trend in the proportion of non-pure play companies that now derive meaningful revenues from climate-related businesses. This we believe reflects a significant shift away from the traditional perception that climate-related businesses remain the preserve of the small and medium-sized pure-play companies. Our quantitative macro climate framework reveals that climate-related businesses now form a significant and rising portion of the total revenues of an ever growing cross-section of industries and large corporations, across the globe.

**HSBC Climate Change Index – pure/non-pure play weightings**

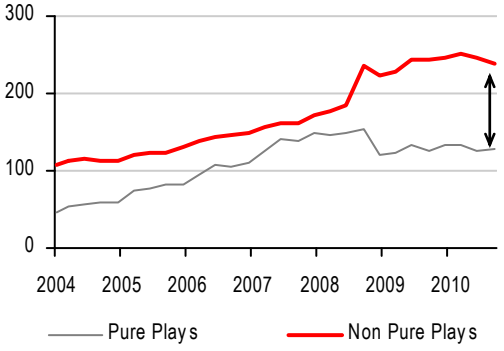



Source: HSBC Quantitative Research, data as 3 September 2010

Since 2007, the proportion of pure-play companies within the HSBC Climate Change Index has fallen, dropping from 56% to 40%, consistent with the simultaneous rise in the representation of large-cap companies.

Unsurprisingly, the large corporations tend also to be among the non-pure plays and this shift away from pure plays is compelling evidence of the wider and growing adoption of climate-related businesses across the world's industrial base.

**Pure play and non-pure play constituent growth**




Source: HSBC Quantitative Research

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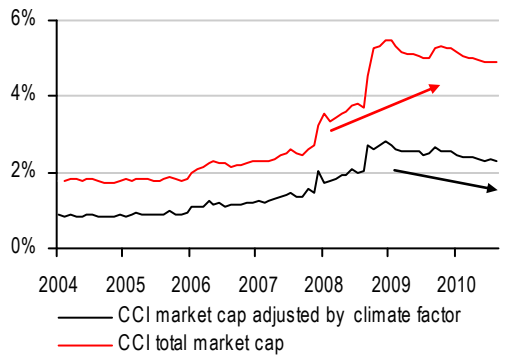
## Market capitalisation of index

In addition to the strong growth in the number of companies globally that are engaged in providing goods, products and services to address the issues of climate change, the market capitalisation of the HSBC Global Climate Change Index has also been on the rise and stands at 5% of global listed market cap, on a full market cap basis.

Relative to global listed market capitalisation, this is a striking reflection of the significance of the theme – climate change now represents a larger and increasingly relevant part of global listed market capitalisation, having been less than 2% in 2004.

**HSBC Climate Index Market Cap as % of Global Market Cap#**



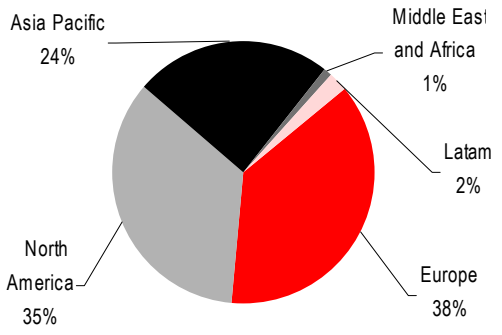

Source: HSBC Quantitative Research, # QT database

What is striking about the chart above is the behaviour of the market capitalisation of non-pure play companies, which has been rising at the expense of the pure plays, much in line with our earlier observation of the rise in the number of non-pure play constituents.

## Regional and country representation

At 38%, Europe continues to reflect the largest regional weight, followed by North America at 35% and Asia Pacific at 24%. The remaining 3% is accounted for by the Middle East & Africa and Latam.

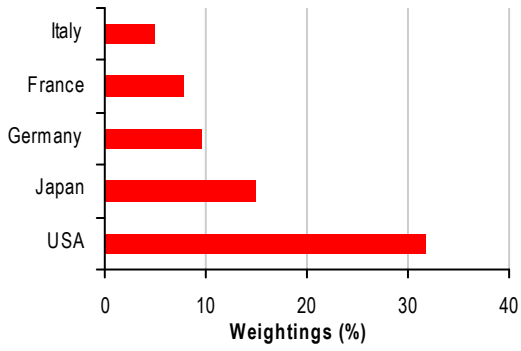
**HSBC Climate Change Index - Regional weights***




Source: HSBC Quantitative Research, * 3 September 2010

In terms of individual country representations, the US at 32.2% is by far the largest weighted country followed by Japan at 15.1% and Germany at 9.7%.

**HSBC Climate Change Index – top 5 country weights***




Source: HSBC Quantitative Research, *Data as of 3 September 2010

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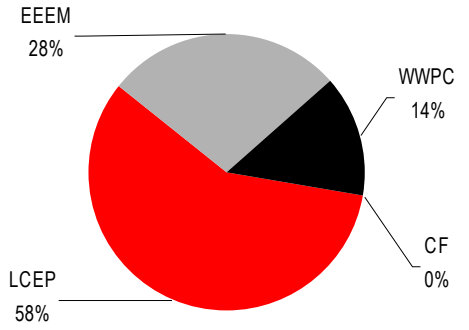
# Sector and theme representation

Low Carbon Energy Production continues to dominate the climate economy, accounting for 58% of the HSBC Climate Change Index followed by Energy Efficiency & Energy Management at 28% and Water, Waste and Pollution Control at 14%.

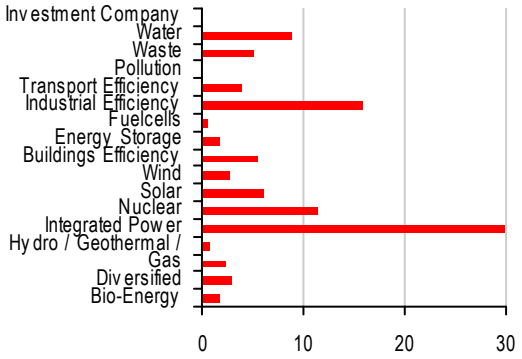
**HSBC Climate Change Index - Sector Representation***




Source: HSBC Quantitative Research, * Data as of 3 September 2010

Climate Finance is still a laggard and its representation stands at only 0.1%.

**HSBC Climate Change Index - Theme Representation %**




Source: HSBC, * Data as of 3 September 2010

Integrated Power remains as the most heavily weighted theme at 30%, followed by Industrial Efficiency at 15.8% and Nuclear at 11.4%

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# Climate change performance and investments

- LatAm and Asia Pacific outperform global equities
- Global Climate index down 7.1% versus 3.2% decline in global equities
- North America posts strongest performance in EEEM

## Climate performance

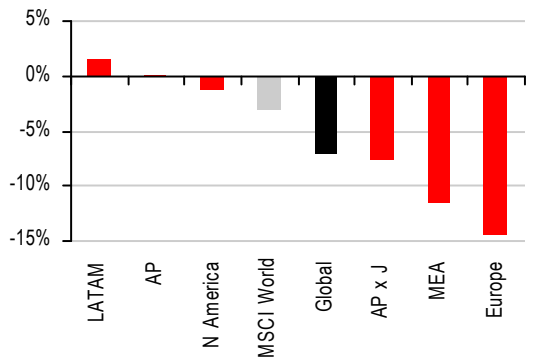
Climate-related performances in LatAm and Asia Pacific have both recorded positive returns this year, delivering 1.5% and 0.1% respectively compared with a decline of 3.2% across global equities, as measured by the MSCI World Index. In general, however, the performance of the climate theme has lagged that of global equities and is down 7.1%, which is not surprising given the turbulent political and financial backdrop for climate investments in 2010.

## Climate sector performance

On a sector basis, Energy Efficiency and Energy Management (EEEM) and Water, Waste and Pollution Control have been the strongest performers, having declined only 1.4% and 2.8% respectively, y-t-d.

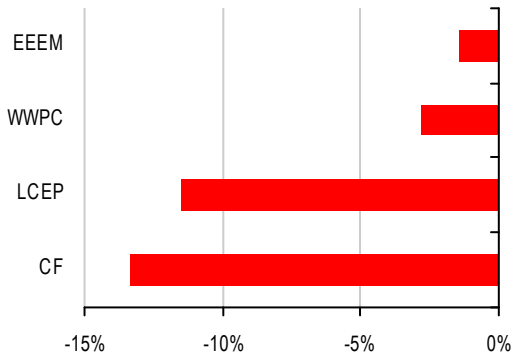
In contrast, Climate Finance (CF) and Low Carbon Energy Production (LCEP) have been the weakest performers, posting declines of 13.3% and 11.5% respectively.

**Regional HSBC Climate Change Indices & MSCI World returns y-t-d**




Source: HSBC Quantitative Research, * performance YTD as of 4 Sep 2010

**HSBC Climate Change Sector Returns y-t-d**




Source: HSBC Quantitative Research, * performance YTD as of 3 Sep 2010

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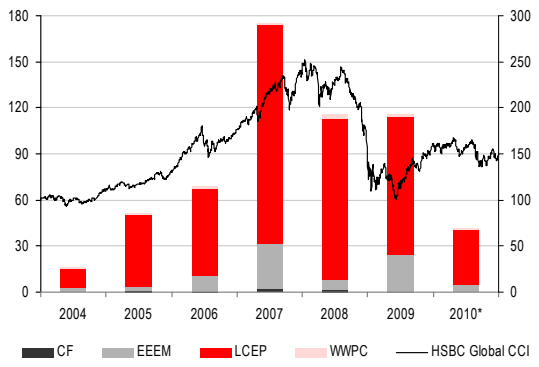
## Climate investment flows

Global investment flows into the sector have generally suffered in 2010 on the back of a combination of waning investor interest, a weak economic backdrop and a failure to deliver a global deal on emissions in Copenhagen. The result is that climate related investments have fallen 15% from USD46bn in 1H 2009 to USD39bn in 1H 2010.

Europe has been hardest hit with a decline in investment flows of 53% over the same period, which has in part contributed to its poor overall performance – down 23.1%. At the same time sentiment towards the sector has not been helped following concerns over retroactive measures to cut feed-in-tariffs in Italy and France.

In contrast and despite concerns over the lack of progress on federal climate change and clean energy legislation in the US, the EEEM sector in North America has bucked the trend and has seen increased investment flows in 1H 2010 compared to 1H 2009. In particular, industrial and transport efficiency have benefited from increased investment flows over the same period, resulting in rising investor interest, which has subsequently been reflected in the strong performance of these themes. Industrial efficiency has risen 8.4% while Transport efficiency is up 12.0% y-t-d.

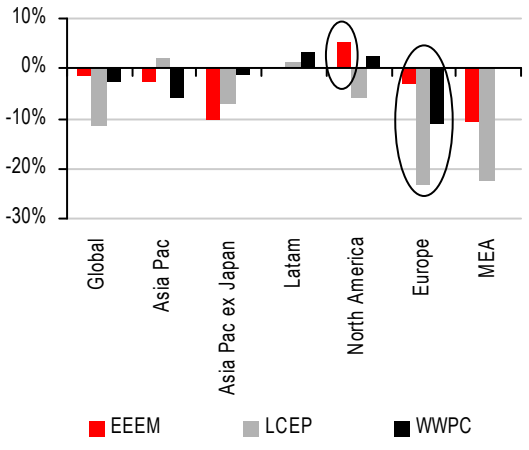
**Annual climate investment flows by sector (USD bn) and Index performance**




The chart details the annual investment flows in terms of Public Markets (IPOs, M&A, PIPE), Asset Finance, Venture Capital and Private Equity that have taken place in the themes related to the climate change index. The data has been sourced from BNEF and accounts for only disclosed deals

Source: HSBC Equity Quantitative Research, BNEF, * up to 30 August 2010

**Regional climate sector performance - 1 Jan to 3 Sep 2010**




Source: HSBC Equity Quantitative Research

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# Global climate valuations

- Energy Efficiency and Energy Management continues to offer the strongest consensus earnings growth for 2011e at 26%
- Stimulus support for EEEM sector expected to continue through to 2011
- EEEM sector PE premium is justified in our view

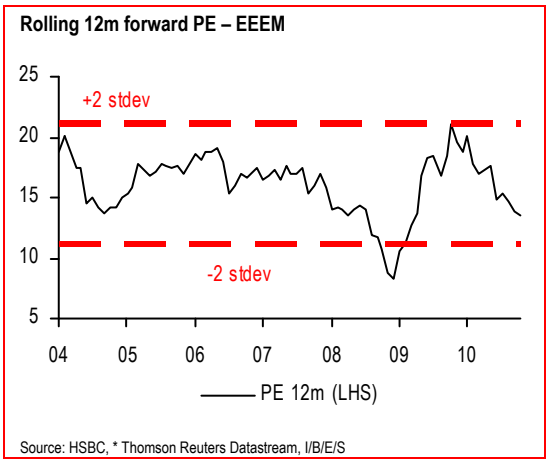
## Climate valuations

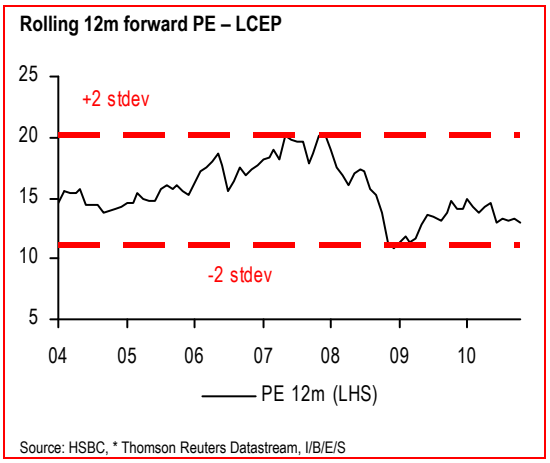
### 12m forward PE valuations

- The charts below depict the historical rolling 12-month-forward PE for Energy Efficiency and Energy Management (EEEM) and the Low Carbon Energy Production (LCEP) sector*.
- The EEEM sector 12-month-forward consensus PE is currently 13.5x, which places it at 1 standard deviation below its 5-year mean.
- In comparison, the LCEP sector is trading on a consensus 12-month forward PE of 13x which is also 1 standard deviation below its 5-year mean.

### Forecast earnings growth

- However, the EEEM sector continues to display the strongest consensus earnings growth forecast of 76% for 2010e and 26% for 2011e while the LCEP sector offers growth of only 11% in 2010 and 15% in 2011.
- On the basis that both of these sectors are currently trading on similar 12-month-forward valuations, we favour EEEM due to its considerably superior growth when compared to those of the LCEP sector.



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- Additionally we also expect the Energy Efficiency and Energy Management theme to continue to benefit from stimulus support both in Asia and North America over the remainder of 2010 and into 2011.

**HSBC Global Climate Change Benchmark Index: I/B/E/S consensus forecasts**

| | EPS growth (%) | | | PE (x) | | | DPS growth (%) | | | Dividend yield (%) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | 2010e | 2011e | 2009 | 2010e | 2011e | 2009 | 2010e | 2011e | 2009 | 2010e | 2011e |
| **Low Carbon Energy Production** | **3.7** | **11.0** | **15.3** | **16.0** | **14.5** | **12.6** | **n/m** | **12.1** | **5.9** | **2.7** | **3.2** | **3.4** |
| Bio-energy | -24.3 | 25.3 | 12.8 | 18.8 | 15.3 | 13.6 | n/m | 11.4 | 10.0 | 1.4 | 1.9 | 2.1 |
| Diversified renewable energy | 9.2 | -0.1 | 11.7 | 12.4 | 12.4 | 11.1 | n/m | 3.4 | 5.7 | 2.7 | 3.3 | 3.5 |
| Gas | 0.0 | 17.8 | 11.4 | 20.4 | 17.3 | 15.6 | n/m | 10.9 | 7.5 | 2.1 | 2.3 | 2.5 |
| Geothermal / Hydro/ Marine | 6.9 | -8.4 | 21.5 | 14.2 | 15.6 | 12.8 | n/m | -0.0 | 15.2 | 3.5 | 3.5 | 4.0 |
| Integrated power | 17.7 | -5.9 | 9.2 | 11.9 | 12.6 | 11.5 | n/m | 17.2 | 2.9 | 3.7 | 4.5 | 4.6 |
| Nuclear | 2.4 | 0.2 | 16.0 | 15.4 | 15.4 | 13.3 | n/m | 1.9 | 6.1 | 2.9 | 3.4 | 3.6 |
| Solar | n/m | n/m | 27.7 | n/m | 16.0 | 12.6 | n/m | 32.6 | 15.2 | 0.6 | 0.8 | 1.0 |
| Wind | -37.0 | -6.8 | 61.9 | 25.9 | 27.6 | 17.1 | n/m | 25.7 | 39.7 | 0.5 | 0.8 | 1.2 |
| **Energy Efficiency & Energy Management** | **-19.1** | **76.1** | **26.4** | **29.2** | **16.6** | **13.1** | **n/m** | **11.3** | **19.0** | **1.7** | **2.0** | **2.4** |
| Building efficiency | -63.3 | 143.5 | 23.1 | 34.3 | 14.1 | 11.4 | n/m | 11.6 | 13.2 | 2.2 | 2.4 | 2.7 |
| Energy storage | 62.0 | -68.7 | 673.6 | 49.6 | 158.8 | 20.5 | n/m | 7.0 | 12.9 | 0.9 | 0.9 | 1.0 |
| Fuel cells | 10.5 | 123.8 | 41.9 | 57.0 | 25.5 | 18.0 | n/m | 9.5 | 8.6 | 1.0 | 1.1 | 1.2 |
| Industrial efficiency | 61.6 | 67.8 | 15.3 | 24.9 | 14.8 | 12.9 | n/m | 10.0 | 8.8 | 2.1 | 2.3 | 2.6 |
| Transport efficiency | -71.9 | 62.5 | 51.1 | 34.9 | 21.5 | 14.2 | n/m | 27.9 | 88.1 | 0.4 | 1.1 | 2.1 |
| **Water, Waste & Pollution Control** | **-3.2** | **-1.2** | **13.6** | **15.1** | **15.3** | **13.5** | **n/m** | **-5.5** | **5.7** | **3.1** | **3.2** | **3.4** |
| Pollution control | 7.4 | 26.2 | 1.8 | 14.0 | 11.1 | 10.9 | n/m | n/m | 28.6 | n/m | 0.0 | 0.0 |
| Waste | -12.7 | 8.5 | 14.9 | 18.5 | 17.2 | 14.9 | n/m | -13.6 | 4.3 | 3.2 | 2.8 | 2.9 |
| Water | 1.6 | -6.2 | 13.2 | 13.6 | 14.5 | 12.8 | n/m | -0.1 | 6.3 | 3.0 | 3.5 | 3.8 |
| **HSBC Global Climate Change benchmark** | **-2.4** | **21.5** | **18.1** | **18.4** | **15.2** | **12.8** | **n/m** | **9.1** | **8.7** | **2.4** | **2.8** | **3.1** |
| **Global Equities** | **7.0** | **7.3** | **16.1** | **13.6** | **12.7** | **11.0** | **16.1** | **4.5** | **7.7** | **2.6** | **3.0** | **3.2** |

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

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# Appendix

## HSBC climate change index

The HSBC Global Climate Change Index is designed to track and reflect the stock market performance of key companies that we believe are best placed to profit from a changing climate.

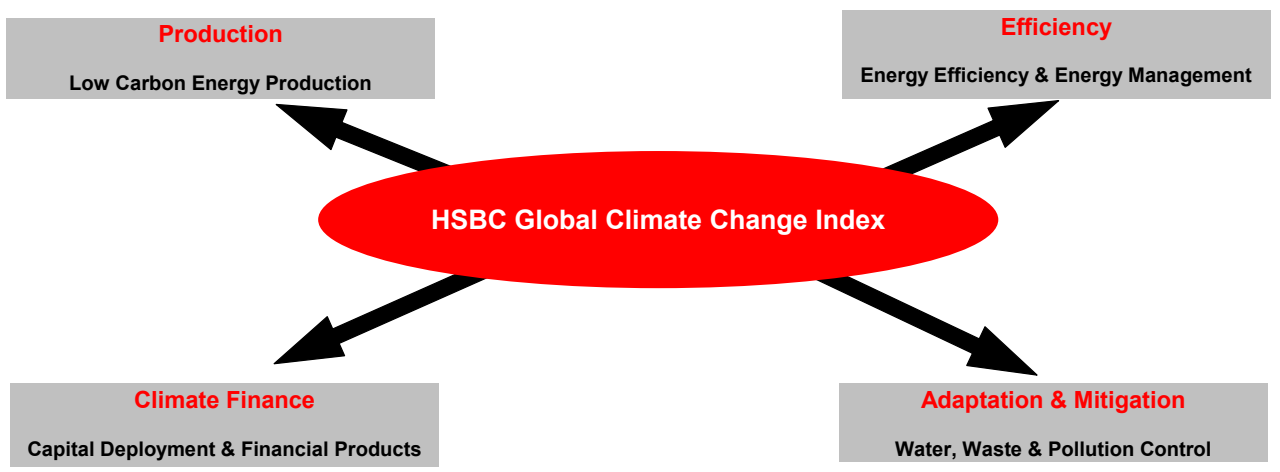
This includes companies and industries involved and engaged in reducing emissions as well as those that have either begun or are beginning to gear up to provide goods and services that address the issues of climate change.

The result is a comprehensive representation of the opportunities for climate change investing, based on the four core investment pillars:

- Low Carbon Energy Production (LCEP).
- Energy Efficiency and Energy Management (EEEM).
- Water, Waste and Pollution Control (WWPC).
- Climate Finance (CF).

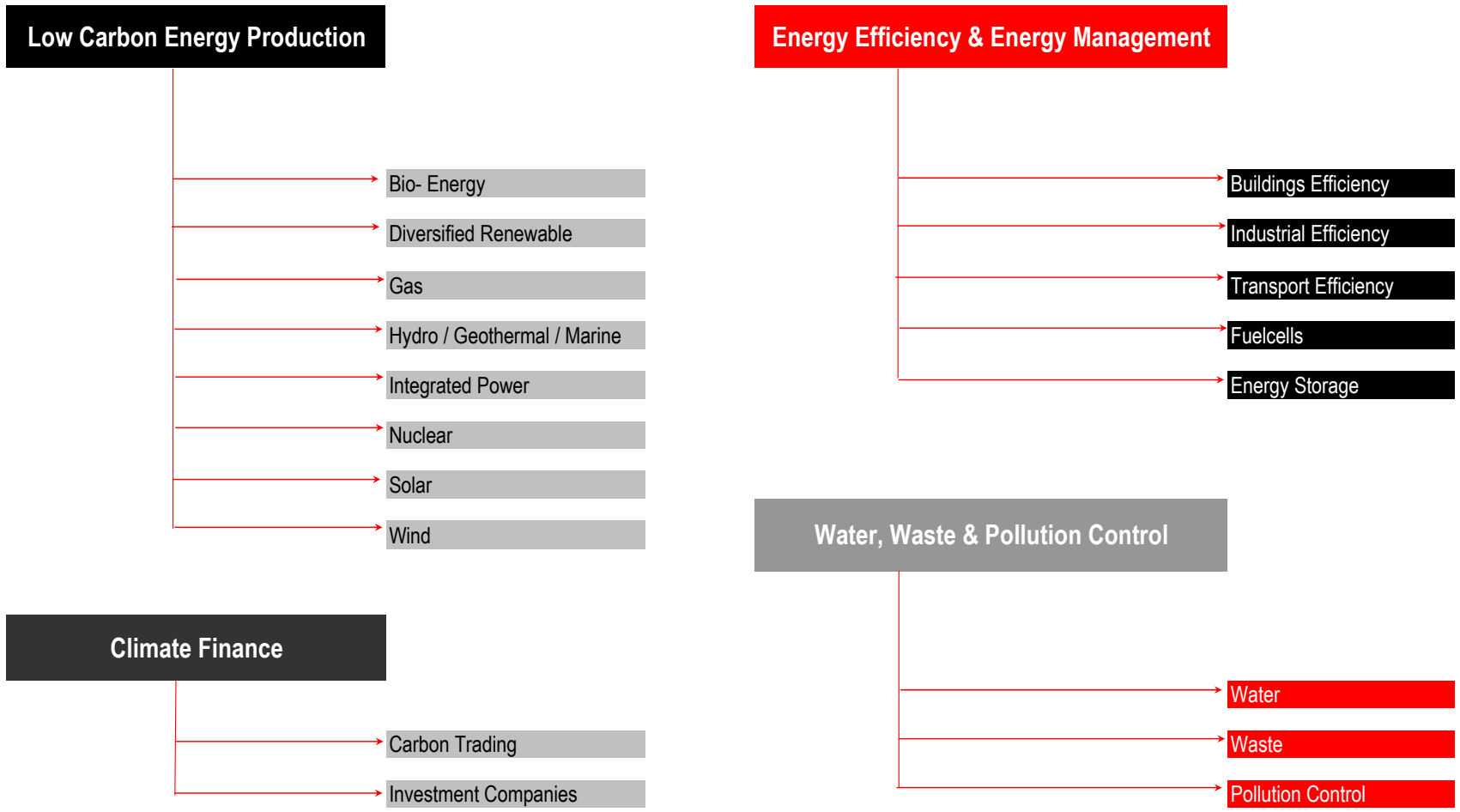
The climate change investment opportunity set is broken down further into detailed the 18 investable themes outlined in the schematic overleaf.

Climate Change Investment Opportunities as defined by HSBC Equity Quantitative Research Group




Source: HSBC Equity Quantitative Research

**HSBC's Macro Quantitative Investment Framework**




Source: HSBC Equity Quantitative Research

# Index methodology

The index is rule-based and uses a modified market capitalisation approach, which takes into account free float and revenues associated with climate change-related businesses.

Recognising that there are a number of large integrated players also exposed to this theme, individual companies are weighted according to their exposure to climate change.

Exposure is defined as the percentage of overall revenues that are attributable to either reducing emissions or to reacting or adapting to climate change.

The revenue data are based on HSBC analysis of publicly available information and an external source specialising in renewable energy, low carbon technology and the carbon markets.

**Climate Change Exposure Factors**

| Revenues Associated with Climate Change | Exposure factor |
|---|---|
| 10% <Revenues < 25% | 0.25 |
| 25%<Revenues < 50% | 0.50 |
| Revenues > 50% | 1.00 |

Source: HSBC

Once a company has been ascribed an exposure factor and it forms part of the selection universe, we will monitor and modify its climate change-related revenues, if necessary, on an annual basis.

## Stock selection criteria

Stocks qualify for selection on the basis of a minimum threshold of revenues from climate change-related activities.

Once a stock passes this screen, a minimum market capitalisation filter is applied, followed by a final criterion based on average daily turnover.

Chronologically, the process is as follows:

- Annual reported revenues from climate-related activities must be greater than 10% of overall revenues
- A minimum market capitalisation cut-off based on the 95th percentile of HSBC, QT's global listed stock market coverage. As of December 2009, this represents a market capitalisation threshold of USD400m
- Minimum average daily trading turnover threshold of 0.02% of full market capitalisation

Once a stock enters the benchmark, which is reviewed on a quarterly basis, it will remain a member as long as it continues to satisfy all the necessary conditions.

## Stock weighting methodology

The index is a modified market capitalisation benchmark which is based upon the free float adjusted market capitalisation of a stock and its exposure factor.

The benchmark has been designed to be unconstrained in terms of country and/or sector. This enables it to reflect the best possible climate change-related investment opportunities.

# Stock size categorisation

In an attempt to identify the make-up of the index by size of constituent, we have employed the following size category definitions and ranked the HSBC stock universe by market capitalisation: The sum of the full market capitalisation of stocks above the 70th percentile, within HSBC's global equities database, is established as the cut-off for large-caps. The sum of the full market capitalisation of stocks above the 90th percentile is established as the cut-off for small-caps.

- Based on dataset as of 3 September 2010, the resulting classes of market capitalisation are:
  - **Large Cap –** greater than USD5.2bn;
  - **Mid Cap** – USD0.9bn to USD5.2bn;
  - **Small Cap** – less than USD0.9bn.

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# HSBC Climate Change Index Review

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# HSBC Global Climate Change Benchmark Index

- Minimum market capitalisation threshold remains at USD400m
- There will be 35 additions to and 36 deletions from the index
- Changes will be effective as of the close of business on 17 September 2010

## Highlights and changes

- The minimum market capitalisation threshold remains at USD400m.
- The Benchmark Index now reflects 17 out of the 18 investment themes. The Carbon Trading theme is currently not represented.
- The annual review for 2010 has also resulted in 45 climate change factor changes
- Annual changes to the Benchmark Index are outlined in the table below.

**HSBC Global Climate Change Benchmark Index – Annual Changes**

| Sector | Ins | Outs |
|---|---|---|
| Low Carbon Energy Production | 25 | 26 |
| Energy Efficiency & Management | 6 | 8 |
| Water, Waste & Pollution Control | 4 | 2 |
| Climate Finance | 0 | 0 |
| **Total** | **35** | **36** |

Note: based on data as of 3 September 2010
Source: HSBC

## New benchmark composition

**Benchmark index new composition as of September 2010**

| Description | No. of stocks | Weighting (%) |
|---|---|---|
| **Low Carbon Energy Production** | **178** | **58.18** |
| Bio-Energy | 13 | 1.80 |
| Diversified Renewable | 19 | 3.03 |
| Gas | 3 | 2.43 |
| Geothermal / Hydro/ Marine | 12 | 0.74 |
| Integrated Power | 42 | 29.88 |
| Nuclear | 26 | 11.44 |
| Solar | 48 | 6.11 |
| Wind | 15 | 2.74 |
| **Energy Efficiency & Management** | **118** | **27.78** |
| Building Efficiency | 37 | 5.55 |
| Energy Storage | 15 | 1.83 |
| Fuelcells | 4 | 0.62 |
| Industrial Efficiency | 38 | 15.81 |
| Transport Efficiency | 24 | 3.98 |
| **Water, Waste & Pollution Control** | **69** | **13.96** |
| Pollution Control | 2 | 0.11 |
| Waste | 17 | 5.10 |
| Water | 50 | 8.75 |
| **Climate Finance** | **2** | **0.08** |
| Carbon trading | 0 | 0.00 |
| Investment company | 2 | 0.08 |
| **Total** | **367** | **100** |

Note: based on data as of 3 September 2010
Source: HSBC

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**Annual changes to the Global Climate Change Benchmark Index**

| Status | Name | Country | Group description |
|---|---|---|---|
| In | BABCOCK & WILCOX | USA | Low Carbon Energy Production |
| In | CENT ELEC STA PRF B | Brazil | Low Carbon Energy Production |
| In | CHINA EVERBRIGHT INT | Hong Kong | Water, Waste & Pollution Control |
| In | CIA SANEAMENTO MINAS | Brazil | Water, Waste & Pollution Control |
| In | CLP HOLDINGS | Hong Kong | Low Carbon Energy Production |
| In | DELSOLAR CO. LTD. | Taiwan | Low Carbon Energy Production |
| In | DOMINION RES (VIR) | USA | Low Carbon Energy Production |
| In | ENDESA CHILE | Chile | Low Carbon Energy Production |
| In | FIRST GEN CORPORAT | Philippines | Low Carbon Energy Production |
| In | GLOBE SPEC METALS | USA | Low Carbon Energy Production |
| In | GREAT PLAINS ENERG | USA | Low Carbon Energy Production |
| In | GREEN ENERGY TECH | Taiwan | Low Carbon Energy Production |
| In | HOKURIKU ELEC PR | Japan | Low Carbon Energy Production |
| In | JINKOSOLAR HLDG ADR | China | Low Carbon Energy Production |
| In | LEAR CORP | USA | Energy Efficiency / Management |
| In | MEYER BURGER TECHNOLOGY | Switzerland | Low Carbon Energy Production |
| In | NVC LIGHTING HOLDING | Hong Kong | Energy Efficiency / Management |
| In | OTTER TAIL PWR CO | USA | Low Carbon Energy Production |
| In | PINNACLE WEST CAP | USA | Low Carbon Energy Production |
| In | PNM RES INC | USA | Low Carbon Energy Production |
| In | POWERCOM CO | Taiwan | Low Carbon Energy Production |
| In | PROGRESS ENERGY | USA | Low Carbon Energy Production |
| In | RED ELECTRICA CORP | Spain | Low Carbon Energy Production |
| In | SCANA CORP(NEW) | USA | Low Carbon Energy Production |
| In | SMITH (AO) | USA | Energy Efficiency / Management |
| In | SOLARTECH ENERGY CORP | Taiwan | Low Carbon Energy Production |
| In | STANTEC INC | Canada | Water, Waste & Pollution Control |
| In | TESLA MOTORS INC | USA | Energy Efficiency / Management |
| In | TOHOKU ELEC POWER | Japan | Low Carbon Energy Production |
| In | TRANSALTA | Canada | Low Carbon Energy Production |
| In | TUBE INV OF INDIA | India | Energy Efficiency / Management |
| In | WASION GRP HLDG LTD | Hong Kong | Energy Efficiency / Management |
| In | WISCONSIN ENERGY | USA | Low Carbon Energy Production |
| In | WOONGJIN ENERGY | Korea | Low Carbon Energy Production |
| In | YTL POWER INTL | Malaysia | Water, Waste & Pollution Control |
| Out | AISIN SEIKI | Japan | Energy Efficiency / Management |
| Out | ASTRA AGRO LESTARI | Indonesia | Low Carbon Energy Production |
| Out | ATHEN WATER SUPPLY | Greece | Water, Waste & Pollution Control |
| Out | AVISTA | USA | Low Carbon Energy Production |
| Out | CAPITAL POWER INCO | Canada | Low Carbon Energy Production |
| Out | CENTERPOINT ENERGY | USA | Low Carbon Energy Production |
| Out | CHINA HIGH PRECISION | Hong Kong | Energy Efficiency / Management |
| Out | CLECO CORP | USA | Low Carbon Energy Production |
| Out | CONERGY AG | Germany | Low Carbon Energy Production |
| Out | DTE ENERGY | USA | Low Carbon Energy Production |
| Out | ELEC POWER DEV | Japan | Low Carbon Energy Production |
| Out | EMAMI LTD | India | Low Carbon Energy Production |
| Out | ERA INFRA ENGINEER | India | Low Carbon Energy Production |
| Out | EXIDE TECHNOLOGIES | USA | Energy Efficiency / Management |
| Out | FIRST RESOURCES LTD | Singapore | Low Carbon Energy Production |
| Out | GOLDEN AGRI RESOUR | Singapore | Low Carbon Energy Production |
| Out | HAVELLS INDIA | India | Energy Efficiency / Management |
| Out | IHI CORPORATION | Japan | Energy Efficiency / Management |
| Out | ILLOVO SUGAR | South Africa | Low Carbon Energy Production |
| Out | KALPATARU POWER TRAN | India | Low Carbon Energy Production |
| Out | KONINKLIJKE DSM NV | Netherlands | Low Carbon Energy Production |
| Out | KUALA LUMPUR KEPONG | Malaysia | Low Carbon Energy Production |
| Out | LITEON TECHNOLOGY | Taiwan | Energy Efficiency / Management |
| Out | LONZA GROUP AG | Switzerland | Low Carbon Energy Production |
| Out | NGK INSULATORS | Japan | Energy Efficiency / Management |
| Out | NICHIAS | Japan | Energy Efficiency / Management |
| Out | NRG ENERGY | USA | Low Carbon Energy Production |
| Out | ORGANO | Japan | Water, Waste & Pollution Control |
| Out | RURAL ELECTRIFICATN | India | Low Carbon Energy Production |
| Out | SCOT & STHN ENERGY | UK | Low Carbon Energy Production |
| Out | TATA POWER | India | Low Carbon Energy Production |
| Out | TRACTEBEL ENERGIA | Brazil | Low Carbon Energy Production |
| Out | UNIMICRON TECHNOLOGY | Taiwan | Low Carbon Energy Production |
| Out | WARTSILA OYJ ABP | Finland | Low Carbon Energy Production |
| Out | WILMAR INTERL LTD | Singapore | Low Carbon Energy Production |
| Out | YARA INTERNATIONAL | Norway | Low Carbon Energy Production |

Note: based on data as of 3 September 2010
Source: HSBC

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# HSBC Investable Climate Change Index

- There will be 8 additions to and 8 deletions from the index
- Changes will be effective as of the close of business on 17 September 2010
- Indian stocks in this index continue to be excluded**

## Highlights

- The minimum market capitalisation threshold remains at USD800m.
- The Investable Index now reflects 12 investment themes
- Annual changes to the Investable Index are outlined in the table below

**HSBC Investable Climate Change Index - Annual Changes**

| Sector | Ins | Outs |
|---|---|---|
| Low Carbon Energy Production | 7 | 2 |
| Energy Efficiency & Management | 1 | 6 |
| Water, Waste & Pollution Control | 0 | 0 |
| **Total** | **8** | **8** |

Note: based on data as of 3 September 2010
Source: HSBC

*** http://web.sebi.gov.in/press/2007/2007286.html*

## New Investable composition

**Investable index new composition as of September 2010**

| Description | No. of stocks | Weighting (%) |
|---|---|---|
| **Low Carbon Energy Production** | **25** | **64.30** |
| Bio-Energy | 1 | 0.35 |
| Diversified Renewable | 2 | 2.99 |
| Integrated Power | 4 | 27.87 |
| Nuclear | 6 | 21.54 |
| Solar | 8 | 6.41 |
| Wind | 4 | 5.14 |
| **Energy Efficiency & Management** | **10** | **8.34** |
| Building Efficiency | 4 | 2.97 |
| Energy Storage | 2 | 0.91 |
| Industrial Efficiency | 2 | 2.20 |
| Transport Efficiency | 2 | 2.26 |
| **Water, Waste & Pollution Control** | **15** | **27.37** |
| Waste | 5 | 12.28 |
| Water | 10 | 15.09 |
| **Total** | **50** | **100** |

Note: based on data as of 3 September 2010
Source: HSBC

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**Annual changes to the HSBC Investable Climate Change Index**

| Status | Name | Country | Group description |
|---|---|---|---|
| In | ELECTRICITE DE FRANCE | France | Low Carbon Energy Production |
| In | ENDESA CHILE | Chile | Low Carbon Energy Production |
| In | ENEL | Italy | Low Carbon Energy Production |
| In | GCL-POLY ENERGY HLDG | Hong Kong | Low Carbon Energy Production |
| In | KANSAI ELEC POWER | Japan | Low Carbon Energy Production |
| In | KYUSHU ELEC POWER | Japan | Low Carbon Energy Production |
| In | LENNOX INTL INC | USA | Energy Efficiency & Management |
| In | MEYER BURGER TECHNOLOGY | Switzerland | Low Carbon Energy Production |
| Out | AQUARIUS PLATINUM | UK | Energy Efficiency & Management |
| Out | EDP ENERGIAS PORT | Portugal | Low Carbon Energy Production |
| Out | EVERLIGHT ELECTRON | Taiwan | Energy Efficiency & Management |
| Out | GS YUASA CORP | Japan | Energy Efficiency & Management |
| Out | IMPALA PLATINUM | South Africa | Energy Efficiency & Management |
| Out | KUALA LUMPUR KEPONG | Malaysia | Low Carbon Energy Production |
| Out | LONMIN | UK | Energy Efficiency & Management |
| Out | SAMSUNG SDI | Korea | Energy Efficiency & Management |

Note: based on data as of 3 September 2010
Source: HSBC

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# HSBC Climate Change 100 Index

- There will be 14 additions to and 14 deletions from the index
- Changes will be effective as of the close of business on 17 September 2010
- Indian stocks in this index continue to be excluded**

## Highlights

- The minimum market capitalisation threshold remains at USD400m.
- The Benchmark Index now reflects 16 out of the 18 investment themes. The Climate Finance sector is currently not represented.
- Annual changes to the Climate 100 Index are outlined in the table below

**Annual changes to the HSBC Climate Change 100 Index**

| Sector | Ins | Outs |
|---|---|---|
| Low Carbon Energy Production | 10 | 11 |
| Energy Efficiency & Management | 4 | 3 |
| Water, Waste & Pollution Control | 0 | 0 |
| **Total** | **14** | **14** |

Note: based on data as of 3 September 2010
Source: HSBC

*** http://web.sebi.gov.in/press/2007/2007286.html*

## New Climate 100 composition

**Climate 100 index new composition as of September 2010**

| Description | No. of stocks | Weighting (%) |
|---|---|---|
| **Low Carbon Energy Production** | **54** | **59.32** |
| Bio-Energy | 1 | 0.89 |
| Diversified Renewable | 3 | 1.06 |
| Gas | 3 | 3.39 |
| Geothermal / Hydro/ Marine | 1 | 0.12 |
| Integrated Power | 20 | 34.64 |
| Nuclear | 7 | 11.91 |
| Solar | 16 | 5.45 |
| Wind | 3 | 1.86 |
| **Energy Efficiency & Management** | **28** | **27.55** |
| Building Efficiency | 7 | 4.73 |
| Energy Storage | 4 | 1.53 |
| Fuelcells | 0 | 0.00 |
| Industrial Efficiency | 13 | 19.37 |
| Transport Efficiency | 4 | 1.92 |
| **Water, Waste & Pollution Control** | **18** | **13.12** |
| Pollution Control | 1 | 0.14 |
| Waste | 4 | 5.24 |
| Water | 13 | 7.75 |
| **Total** | **100** | **100** |

Note: based on data as of 3 September 2010
Source: HSBC

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**Annual changes to the HSBC Climate Change 100 Index**

| Status | Name | Country | Group description |
|---|---|---|---|
| In | ANGLO PLATINUM LTD | South Africa | Energy Efficiency & Management |
| In | DAINIPPON SCREEN | Japan | Low Carbon Energy Production |
| In | DOMINION RES (VIR) | USA | Low Carbon Energy Production |
| In | HANWHA CHEMICAL | Korea | Low Carbon Energy Production |
| In | LEAR CORP | USA | Energy Efficiency & Management |
| In | PINNACLE WEST CAP | USA | Low Carbon Energy Production |
| In | PROGRESS ENERGY | USA | Low Carbon Energy Production |
| In | RED ELECTRICA CORP | Spain | Low Carbon Energy Production |
| In | SCANA CORP | USA | Low Carbon Energy Production |
| In | SUMCO CORP | Japan | Low Carbon Energy Production |
| In | TORAY INDUSTRIES | Japan | Energy Efficiency & Management |
| In | VEECO INSTRUMENTS | USA | Energy Efficiency & Management |
| In | WISCONSIN ENERGY | USA | Low Carbon Energy Production |
| In | WOONGJIN ENERGY | Korea | Low Carbon Energy Production |
| Out | AISIN SEIKI | Japan | Energy Efficiency & Management |
| Out | CENTERPOINT ENERGY | USA | Low Carbon Energy Production |
| Out | CEZ | Czech Republic | Low Carbon Energy Production |
| Out | CHINA LONGYUAN P 'H' | China | Low Carbon Energy Production |
| Out | DTE ENERGY | USA | Low Carbon Energy Production |
| Out | IBERDROLA RENOVABLES | Spain | Low Carbon Energy Production |
| Out | DSM | Netherlands | Low Carbon Energy Production |
| Out | MEIDENSHA CORP | Japan | Low Carbon Energy Production |
| Out | NGK INSULATORS | Japan | Energy Efficiency & Management |
| Out | NRG ENERGY | USA | Low Carbon Energy Production |
| Out | SCOT & STHN ENERGY | UK | Low Carbon Energy Production |
| Out | SEOUL SEMICONDUCTOR | Korea | Energy Efficiency & Management |
| Out | SHAW GROUP | USA | Low Carbon Energy Production |
| Out | YARA INTERNATIONAL | Norway | Low Carbon Energy Production |

Note: based on data as of 3 September 2010
Source: HSBC

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# Notes

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# Notes

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# Notes

# Disclosure appendix

## Analyst Certification

The following analyst(s), economist(s), and/or strategist(s) who is(are) primarily responsible for this report, certifies(y) that the opinion(s) on the subject security(ies) or issuer(s) and/or any other views or forecasts expressed herein accurately reflect their personal view(s) and that no part of their compensation was, is or will be directly or indirectly related to the specific recommendation(s) or views contained in this research report: Joaquim De Lima and Vijay Sumon

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## Rating definitions for long-term investment opportunities

**Stock ratings**

HSBC assigns ratings to its stocks in this sector on the following basis:

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Our ratings are re-calibrated against these bands at the time of any 'material change' (initiation of coverage, change of volatility status or change in price target). Notwithstanding this, and although ratings are subject to ongoing management review, expected returns will be permitted to move outside the bands as a result of normal share price fluctuations without necessarily triggering a rating change.

*A stock will be classified as volatile if its historical volatility has exceeded 40%, if the stock has been listed for less than 12 months (unless it is in an industry or sector where volatility is low) or if the analyst expects significant volatility. However,

stocks which we do not consider volatile may in fact also behave in such a way. Historical volatility is defined as the past month's average of the daily 365-day moving average volatilities. In order to avoid misleadingly frequent changes in rating, however, volatility has to move 2.5 percentage points past the 40% benchmark in either direction for a stock's status to change.

## Rating distribution for long-term investment opportunities

**As of 13 September 2010, the distribution of all ratings published is as follows:**

| | | |
|---|---|---|
| **Overweight (Buy)** | 51% | (21% of these provided with Investment Banking Services) |
| **Neutral (Hold)** | 36% | (18% of these provided with Investment Banking Services) |
| **Underweight (Sell)** | 13% | (18% of these provided with Investment Banking Services) |

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