Change is Coming: A Framework for Climate Change - a Defining Issue of the 21st Century

CARING FOR CLIMATE SERIES

About the United Nations Global Compact

Launched in 2000, the United Nations Global Compact is a both a policy platform and a practical framework for companies that are committed to sustainability and responsible business practices. As a multi-stakeholder leadership initiative, it seeks to align business operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption and to catalyze actions in support of broader UN goals. It is the world's largest voluntary corporate citizenship initiative, with over 6,500 signatories based in more than 130 countries. Visit www.unglobalcompact.org.

About Goldman Sachs

GS SUSTAIN research identifies the implications to investors of the key structural trends facing the global economy, environment, societies and industries. The GS SUSTAIN framework applies objective measures to identify companies well-placed to sustain competitive advantage and superior returns on capital over the long term (3-5 years).

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Foreword

Caring for Climate (C4C) was introduced by United Nations Secretary-General Ban Ki-moon in July 2007. The Secretary-General challenged Global Compact participants to exercise leadership on climate issues by:

• making climate change a leadership issue for strategy and operations;
• setting emission reduction targets and exploring low-carbon technologies;
• supporting public policy efforts aimed at achieving low carbon economies;
• sharing experiences and publicly disclosing progress made on an annual basis.

Less than two years on, Caring for Climate has emerged as the world's largest and most diversified business engagement platform on climate, with more than 350 corporate signatories in over 60 countries.

Less than seven months before the crucial UN Climate Change Conference in Copenhagen, we are releasing several new research studies and reports, the Caring for Climate Series, to offer a range of perspectives on the role of business and investors in tackling climate change. It is our hope that the findings of the C4C Series will inspire more businesses to make climate change a priority issue, so that policy makers will feel more confident that business is ready to be part of the solution.

The good news is that businesses from all regions and sectors have already started their journey towards energy efficiency, innovation and GHG emission reductions. Indeed, in many instances businesses have embraced climate action as an opportunity to drive efficiency and to gain competitive advantages, even where Governments have not yet taken action.

Caring for Climate participants recognize that climate change is not only an environmental issue. Around the world, businesses are beginning to feel the economic impacts as well. Consequently, some have made the connection between mitigation and adaptation, putting in place long-term measures to address not only emissions, but also food and water concerns and related natural resource issues. In fact, this drive towards energy efficiency and carbon reductions, combined with a proactive management of systemic climate risks, is defining a new level of environmental stewardship. Long-term investors, asset managers and analysts are also beginning to integrate these considerations into investment analysis and decision-making.

The bad news is that, despite encouraging and inspiring leadership, the number of businesses that are actively addressing climate change is far too small. Too many are still sitting on the fence waiting for others to act first.

What is needed now is Government leadership to produce a clear incentive structure that favors good performance and a global deal on climate change that creates certainty. Governments should be confident that change is possible. If Caring for Climate is any indication, business and investors certainly have the capacity and understand the compelling case for taking action.

We therefore hope that the C4C Series will give policy makers and negotiators the confidence and inspiration to bring the Copenhagen Climate Conference to a successful conclusion.

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Goldman Sachs:
Change is coming: A framework for climate change – defining issue of the 21st century

Goldman Sachs Global Investment Research has undertaken a comprehensive and detailed analysis of the implications of climate change on long term corporate performance, the responses of companies to those emerging environmental pressures and the consequent investment conclusions. That research outlines the prospect of climate change becoming increasingly important to corporate performance, through intensifying regulation and broader social change and resulting in increasing dispersion between the financial performances of those companies better able to adapt to the challenges and opportunities stemming from the rising importance of climate change and those that fail to adjust sufficiently quickly to a changing, emerging reality.Goldman Sachs examines the performances of ~800 global companies across every major sector across a wide range of climate-related topics.

This summary, presented as part of the Caring for Climate Series, outlines the key areas of more detailed research undertaken and published by Goldman Sachs Global Investment Research.

Introducing a climate change framework

We expect climate change to become an increasingly important investment theme in coming years. As a result, we have introduced a framework for assessing its impacts on global industries and identifying those companies best positioned to sustain leadership as the global economy adapts.

We have examined ~800 global companies with a combined market capitalization equal to ~90% of the value of the MSCI World index. To each company, we apply objective and quantifiable measures of performance in climate-related areas, based on companies' publically reported information to identify companies most effectively managing the challenges and opportunities climate change will present to their industry. Based on an analysis of performance in the areas most important to each industry, we identify leaders in three categories: 1) Abatement Leaders (in carbon intensive industries), 2) Adjustment Leaders (in low carbon industries in which management of supply chains and product development will be key) and 3) Solutions Providers (beneficiaries of growth in emerging technologies).

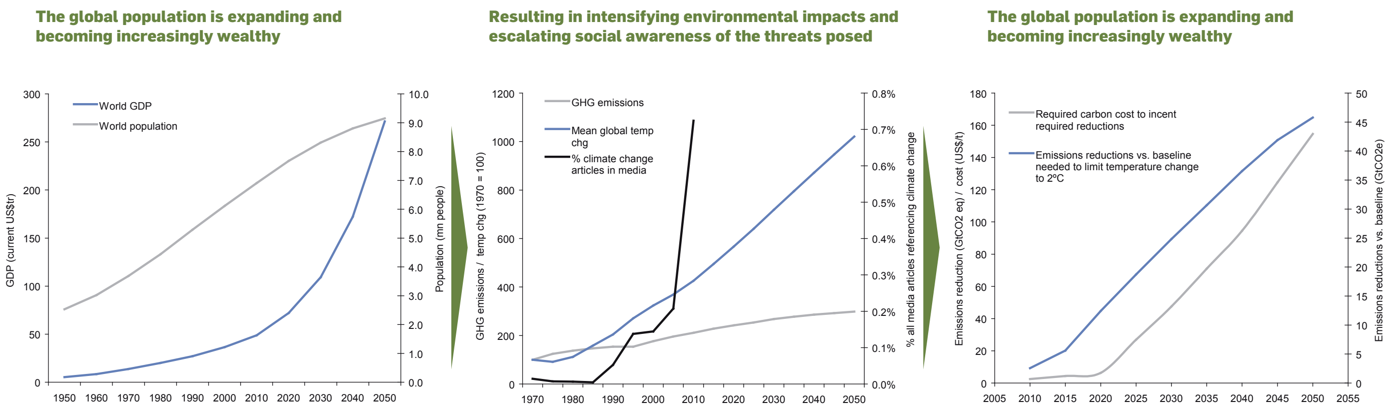
Social and political change is accelerating

Over a relatively short period, the climate change debate has moved from "are man-made emissions resulting in temperature changes?" to "what can be done to avert the worst threats it poses?". Population growth and economic development are placing mounting pressures on the global environment. Climate change is the highest profile of those pressures. Society's awareness of the threats climate change presents, its causes, and willingness to take action to drive the changes needed to avert the worst effects — whether directly or through support for political intervention — are strengthening quickly.

In this context, the science of climate change is, in many ways, less vital than the increasingly widespread social acceptance that the climate is changing, that man-made greenhouse gas (GHG) emissions are responsible, and that action can be taken to avoid its worst effects. As a result, governments have been given a mandate to regulate companies' performances and investment plans, and there is increasing evidence they are taking up that mandate.

To sustain or establish industry leadership, companies must adapt to the changing pressures placed on them and their industry value chains, as well as to the impacts of changes in the physical environment itself.

Exhibit 1: Significant change lies ahead for global industries



Source: OECD, UN Population Division, Factiva, Goldman Sachs Research.

Looking forward, the 15th Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) in December 2009 has provided a focus for action by the major global economies. Whether that event will provide a concrete, binding global agreement on the path to a low carbon economy is unclear. However, it has provided a focus for international discussion and debate on the issue, which itself is likely to create pressure and catalyze action.

In our view, the result will be an acceleration in the pace of change forced on industries. The relatively slow speed with which most organizations are able to redesign operations and reposition their business models will provide a window of competitive advantage to those that have taken early action.

That tipping point of importance — at which environmental performance and companies' adaptation to the changing pressures climate change will bring in particular — is approaching. As the issue has shifted from the niche to the mainstream within society, environmental performance is increasingly viewed as a key component of companies' core strategies rather than as a "social responsibility".

Exhibit 2: We are close to a tipping point

2000 → **2009** → **?**

Early stage adoption

- Limited business awareness
- Science debated
- Niche social issue
- Focus on risks rather than opportunities
- Financial costs and benefits unclear
- Regulation very limited, imperfect
- Emerging leaders

Tipping point

- Increasing business awareness
- Shift from niche social issue to mainstream concern
- Widespread agreement on science of impacts and causes
- Costs become tangible and begin to become material to profitability
- Regulatory structure becomes clearer
- Increased visibility on extent of market opportunities
- Companies differentiated by early leadership in adaptation

Mainstream adaptation

- Increasing physical impacts strengthen resolve
- Expectations on companies established at a high level
- High and intensifying regulation
- Costs are clear and sizeable
- Large and growing market for climate resilient products
- Companies differentiated by failure to adapt

Source: Acclimatise, Goldman Sachs Research.

Operating performances and investment strategies of global industries will be forced into significant change to achieve targeted GHG emission reductions

Without debating the science of climate change, we believe that scientific and broader social consensus has emerged in recent years that 1) recorded changes in global temperatures in recent years represent a structural change rather than a cyclical pattern and 2) that emissions of greenhouse gases, and carbon dioxide in particular, are the major cause of that temperature change. More importantly, we beleive the social and political will exists to dirve the changes necessary to avoid the worst physical impacts of climate change through a reduction in carbon emissions.

The changes required to make the adjustment from the emissions pathway implied by the baseline scenario to an emissions pathway in which the most significant environmental disruptions are reduced to acceptable levels will require a dramatic reduction in the carbon intensity of the global economy, with impacts on companies across all sectors.

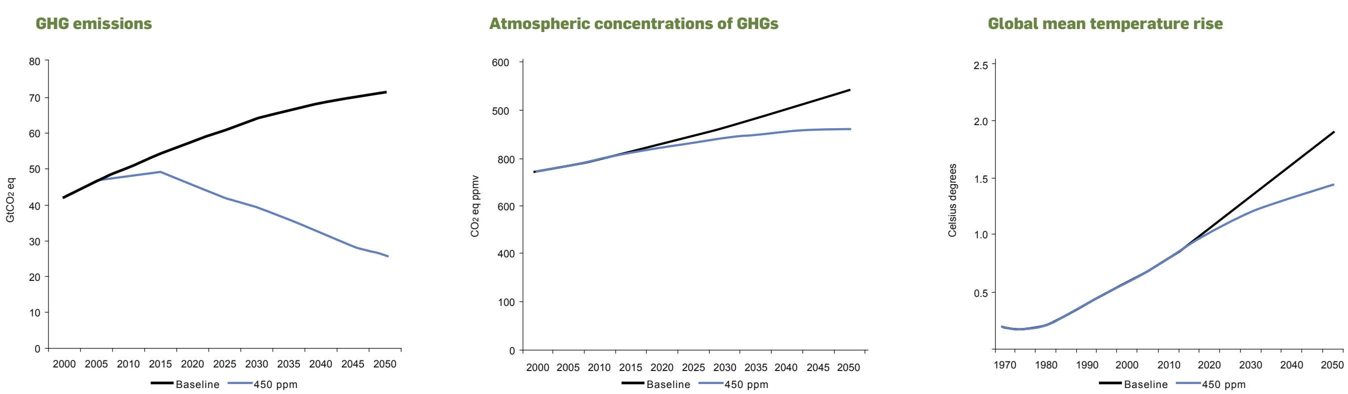
Technologies exist to achieve the reductions in greenhouse gas emissions required to limit the risks of temperature rises to manageable levels, but their adoption must accelerate in coming years. Operating performances and investment strategies of large swathes of established industries must be changed dramatically. Creating the incentives to do so is likely to require a rapid escalation in the penalties for carbon emissions — whether through direct costs or subsidies for investments in alternative technologies.

Amongst others, management consultants McKinsey have estimated the potential abatement opportunity associated with a wide range of measures and the capital costs of their implementation. That work finds that, in principle, implementation of these measures, all of which rely on known technologies, are sufficient to reduce emissions to the level required by the 450 ppm scenario.

However, the practicalities of implementing these measures are demanding. For instance, McKinsey's analysis assumes the share of nuclear, renewables and carbon capture & storage in global power generation rises from 30% to 70% by 2030. It also assumes that by 2030, 40% of all cars will be hybrid or electric vehicles, from under 2% currently.

As an indication of the challenges this presents, to achieve that shift in power generation, we estimate that over 80% of new power generation built in the coming 20 years would have to be zero emission (assuming existing plants are not decommissioned until the end of their useful lives). Given those technologies represent just ~40% of current annual capacity additions, the shift this implies in the growth strategies of power generators and their suppliers is huge. Carbon capture and storage has not yet been employed on a commercial scale by the power industry, and the political resistance and long lead times involved in nuclear plant construction suggest that getting close to that target without decommissioning existing capacity will be close to impossible unless carbon capture and storage technology becomes commercially viable.

Exhibit 3: Significant reduction in annual emissions is needed to minimize the risks of significant environmental disruption Projected trends in GHG emissions, atmospheric concentrations and global mean temperatures under baseline and 450 ppm scenarios



Source: OECD, Goldman Sachs Research.

Consequences of climate change will have an increasing impact on companies' financial performance

Achieving the reductions in emissions targeted by scientific bodies such as the International Panel on Climate Change (IPCC) is likely to be achieved through tougher, more widespread and more internationally coordinated government policies.

In particular, the penalties required to incentivize the emissions reductions needed to stabilize concentrations of greenhouse gases — whether through cap-and-trade schemes, carbon taxes, incentives or the abolition of carbon intensive operations — are likely to be far higher than recent market prices on existing exchanges. Analysis by the OECD has found that the value placed on carbon emissions must escalate quickly to incentivize the required emission reductions. The greater the policy global imperfections, the further those costs must rise to drive change in operating and investment decisions.

Our analysis suggests that the value of annual carbon emissions is likely to grow substantially in coming years. Currently, the value placed on carbon emissions is a fraction the value of fossil fuel production. At the carbon prices required to incentivize emissions reductions, that situation is likely to reverse, and the value placed on carbon rise substantially. As it does so, a significant transfer of value is likely from less- to more-carbon efficient companies in each industry.

All industries will be impacted to some extent

Carbon intensive industries will be at the forefront of these changes but their impacts will feed into every industry, directly or indirectly. Rising penalties for GHG emissions in carbon-intensive industries will result in both a transfer in competitive advantage and economic value towards more carbon-efficient companies and also increased prices for the industry as a whole.

However, the impact of climate-related changes will spread far further than carbon intensive industries. Higher prices for power and carbon-intensive products will likely feed through the supply chains of customer industries, raising the importance of effective management of supply chain costs. Similarly, consumers and regulators are likely to become increasingly demanding of the climate-related performance of products, heightening the importance of adapting to climate-related product pressures. As a result, effectively addressing the challenges and opportunities climate change will bring requires an assessment of performance along the breadth of companies' value chains.

Many companies have begun to acknowledge and react to changing climate-related pressures. We find that close to two-thirds of the large global companies we examined have assigned Board or senior management responsibility and close to half report attempting to quantify its financial impacts. Some 60% of the companies examined have established Board or senior management responsibility for their companies' climate change performance. However, it is also clear that wide differences remain between leaders and laggards in many sectors and countries, creating opportunities for those companies moving early to address the challenges and opportunities created to establish competitive advantage.

For further information please contact the GS SUSTAIN team on gssustainresearchteam@ln.gir.email.gs.com.

The Ten Principles of the United Nations Global Compact

HUMAN RIGHTS

Principle 1	Businesses should support and respect the protection of internationally proclaimed human rights; and
Principle 2	make sure that they are not complicit in human rights abuses.

LABOUR

Principle 3	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
Principle 4	the elimination of all forms of forced and compulsory labour;
Principle 5	the effective abolition of child labour; and
Principle 6	the elimination of discrimination in respect of employment and occupation.

ENVIRONMENT

Principle 7	Businesses are asked to support a precautionary approach to environmental challenges;
Principle 8	undertake initiatives to promote greater environmental responsibility; and
Principle 9	encourage the development and diffusion of environmentally friendly technologies.

ANTI-CORRUPTION

Principle 10	Businesses should work against corruption in all its forms, including extortion and bribery.

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