TALKING Points

Global Climate Change: Corporate Risks and Growth Opportunities

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- Recent developments signal an acceleration of global climate change, raising a wide range of threats to the international environment, including rising sea levels, widening habitat destruction, and increasing climatic volatility.

- Global warming presents major risks to the international business community: Instability of foreign markets; disruption of international operations; shifts in environmental regulations. But global climate change also creates important growth opportunities for companies active in sustainable energy markets.

- Europe is the world leader in green energy technologies, hosting a number of key players in solar, wind, biomass, and other renewable energy technologies. Europe is also a pioneer in clean coal, a transitional technology that is receiving substantial support from the European Union.

- Energy companies face a complex regulatory landscape in Europe, which includes EU-level mandates (notably the "20-20-20" program) and national-level regulatory schemes (e.g. the U.K.'s Carbon Reduction Commitment) aimed at lowering greenhouse gas emissions.

- EU leaders have committed to strengthening the Emissions Trading Scheme, which enables companies to earn marketable carbon credits by investing in CO2-abating technologies. The December 2009 UN Climate Change Conference in Copenhagen is expected to produce a successor to the Kyoto Protocol that bolsters the Clean Development Mechanism to promote the global carbon trading market.

- Initiatives by the new Obama Administration (including endorsement of the Copenhagen agenda, investments in green technologies in the President's fiscal stimulus package, and support of a cap-and-trade system) augur well for the growth of sustainable energy in the United States.

- China has surpassed the U.S. as the world's leading producer of greenhouse gases, underscoring the imperative of hastening the adoption of green technologies in that country and integrating China into the post-Kyoto agreement.

- Africa is underperforming relative to its sustainable energy potential, illustrating the need for increased foreign investment in green technologies and promotion of carbon trading markets in that region.

- Company managers should assess the impact of global climate change on stakeholders, employ appropriate instruments to manage the attendant risks, and formulate strategies to exploit the growth opportunities arising from the expansion of sustainable energy markets.

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Threats from Global Climate Change

Global climate change looms as a disruptive force in coming decades. The International Panel on Climate Change (IPCC) predicts a 1.1 - 6.4oC rise in global temperatures in the 21st century, a warming trend that presents an array of planetary threats:

- **Rising sea levels** that imperil low-lying coastal areas, including densely populated regions of Bangladesh, China, India, and the Netherlands

- **Mounting food shortages** resulting from the loss of agricultural output in arid regions and the depletion of fish stocks in acidic ocean waters

- **Worsening health conditions** in Africa and other low-income regions where global climate change exacerbates malnutrition and widens exposure to malaria and other tropical diseases

- **Growing incidence of extreme weather events** stemming from the disruption of ocean currents and other shifts in global ecology

- **Expanding habitat destruction** that places vulnerable animal and plant species at risk of mass extinction

Recent developments portend an acceleration of global warming. In February 2009, the British-based Scientific Community on Antarctic Research (SCAR) reported that melting of the West Antarctica sheet is progressing more rapidly and widely than previously believed. Researchers have detected similarly alarming developments in Greenland, raising the specter of an irreversible ice-melt that would boost sea levels to catastrophic levels and generate self-reinforcing dynamics (including diminished solar reflection and increased release of methane gas) that would boost global temperatures to the upper end of the IPCC's projected range.

The sense of urgency over global warming that attended the publication of the IPCC's authoritative report in 2007 has diminished amid the worldwide recession. Falling energy consumption produced a six percent reduction in CO2 emissions in 2008, while declining hydrocarbon prices precipitated a sharp contraction of private sector investment in green technologies. But the underlying drivers of global climate change (notably projected increases in greenhouse gas emissions by China, India, and other emerging markets undergoing energy-intensive development) remain intact.

Implications for the International Business Community

These developments create both **risks and opportunities** for the international business community.

The **ecological, political, and socioeconomic fallout** of global climate change could disrupt the international operations and target markets of businesses around the world. Moreover, corporate managers are certain to face an increasingly complex regulatory landscape in coming years as environmental oversight agencies impose pollution mandates and other measures aimed at reducing greenhouse gas emissions. Companies that strengthen their capacity to manage the risks of global climate change will enjoy a major competitive advantage over companies that do not.

At the same time, global climate change raises important growth prospects for investors and manufacturers situated in **renewable energy markets** (biofuels, geothermal, solar, wind, etc.), **clean conventional energy industries** (hydroelectric, nuclear), **advanced hydrocarbon technologies** (coal sequestration, carbon capture and storage), and **waste-to-energy systems** (e.g. anaerobic digestion). Profitable growth opportunities also abound for companies active in **energy conservation** (improved building insulation, energy-

efficient heating and air conditioning, energy-saving home appliances, etc.), which McKinsey Quarterly has identified as the "low hanging fruit" of CO2 mitigation (Per-Anders Enkvist et al, "What Countries Can Do About Cutting Carbon Emissions", April 2008).

Carbon Mitigation in Europe

As pioneers in sustainable energy technologies, European companies enjoy first mover advantages in that growing international market. Germany's **Q-Cells** is the world leader in photovoltaic cells, while Denmark's **Vestas** is a foremost manufacturer of wind turbines. Spain's **Acciona** is a major player in wind, solar, and biomass. The Italian power company **Enel** is expanding capacity in geothermal energy and other renewables.

Europe is also the global leader in **"clean coal"**, a technology which environmental groups loathe but which industry experts consider an indispensable bridge between conventional hydrocarbon and renewable energy. Norway's **Statoil** has been injecting CO2 in its offshore Sleipner facility since 1996, illustrating the utility of carbon sequestration for Enhanced Oil Recovery (EOR) and Enhanced Coal Bed Methane (ECBM) production. In September 2008, Swedish-based **Vattenfall** launched a CCS (carbon capture and storage) pilot plant in Germany, the first of its kind in the world. At their December 2008 summit meeting in Poznan, European Union leaders agreed to subsidize the construction of 12 additional CCS demonstration plants with the aim of achieving full commercialisation of that technology during the next decade. Attainment of commercial parity between CCS-capable plants and conventional coal-fired plants is critical to fulfill the EU's "20-20-20" goal (20 percent reduction of CO2 emissions and 20 percent renewable energy mix by 2020).

European leaders also agreed at Poznan to strengthen the EU's **Emissions Trading Scheme** (ETS), through which European companies that implement green technologies earn credits that can be sold on the carbon trading market. Launched in 2005 under the auspices of the Clean Development Mechanism (CDM) of the Kyoto Protocol, ETS aims to incentivise European companies to invest in renewable energy technologies. But the system has achieved uneven results as a CO2 abatement mechanism. The price of carbon trading credits fell by two-thirds in 2008 under the impact of slumping industrial output and declining energy demand. This has provided a lease on life for high-CO2 enterprises, which find it cheaper to buy low-cost credits and continue polluting than to adopt carbon-abating technologies. Critics of ETS claim that large companies are gaming the system, citing the example of the steel giant **Arcelor Mittal** that has earned new emission credits by temporarily closing CO2-emitting factories rather than investing in green technologies.

In December 2009, the **UN Climate Change Conference** will convene in Copenhagen to draft a successor to the Kyoto Protocol, which is scheduled to expire in 2012. A key item on the Copenhagen agenda will be shoring up the global carbon trading market, whose expansion offers important opportunities for European companies that are developing clean energy technologies and that have acquired valuable experience in Europe's incipient CO2 emissions system.

CO2 Regulations in the U.K.

National-level regulations also play an increasingly important role in Europe's energy industry. In January 2010, the United Kingdom will launch **Carbon Reduction Commitment** (CRC), an emissions trading system that applies to non-energy intensive entities (government institutions, hospitals, supermarket and hotel chains, etc.) not covered under the EU's Emissions Trading Scheme.

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CRC will oblige qualifying British organisations to deliver annual reports of their carbon emissions to the U.K. Environment Agency starting in April 2010. In April 2011, participating institutions must purchase carbon allowances via public auction, the proceeds of which will be recycled back to those entities by means of an annual payment based on their average annual emissions. The Environment Agency will apply a bonus or penalty based on the organisation's standing in a CRC "league table" reporting the carbon performance of participants across the country. In this way, government authorities seek to incentivize U.K. companies to undertake CO2 abatement measures and to "name and shame" laggards at the bottom of the performance table.

The new regulatory scheme will impose short-term costs on all participating organisations in the United Kingdom, which will incur administrative and technical expenses to comply with the CRC requirements. But the system will provide long-term net benefits to institutions that earn bonus payments whose value exceeds the costs of implementing CO2-mitigating business practices and technologies.

Carbon Abatement in Other Regions

Other regions lag Europe in both the technological and regulatory dimensions of global climate change.

As a non-participant in the Kyoto Protocol that has enjoyed relatively low hydrocarbon prices, the **United States** is a late mover in the sustainable energy arena. The spike in oil and gas prices in 2007-08 spurred investment in this industry by American venture capital firms and private equity funds and stimulated research and development in sustainable energy technologies.

Like their European counterparts, U.S. sustainable energy companies have suffered a deep contraction of investment under the impact of the world recession and the global credit crunch. But American investors have signaled their long-term commitment to the industry, while university-level research promises to accelerate the commercialisation of advanced renewable technologies (e.g. algae-based biofuels and cellulosic feedstocks). These developments bode favourably for U.S. players pursuing growth opportunities in global market niches not already dominated by European first movers. Furthermore, the size of the American market confers competitive advantages in the commercialisation of sustainable energy technologies (e.g. carbon capture and storage) that place a premium on scale.

Meanwhile, the Obama Administration has dedicated substantial government funds and tax incentives to clean energy technologies and embraced the forthcoming Copenhagen conference with the goal of ratifying the anticipated successor to the Kyoto Protocol. On April 17, the U.S. Environmental Protection Agency declared CO2 and other greenhouse gases a menace to public health and welfare, strengthening the Administration's regulatory hand and paving the wave for the enactment of a cap-and-trade system that would benefit from the lessons of the EU's Emissions Trading Scheme.

Other countries in the Americas occupy important positions in the global energy market. **Canada** (whose reserves of tar sands shale oil attracted large investments when petroleum prices were spiking) is expanding investments in renewable energy, including collaborative ventures with the United States. As the world leader in sugar-based ethanol, **Brazil** is well poised to exploit growing international demand for alternatives to corn feedstocks, whose diversion to energy propelled the recent rise in global food prices.

In Asia-Pacific, **Australia** (which similar to Canada enjoyed a natural resource boom that came to an abrupt halt with the global recession) has launched a tree plantation project ("Greenhouse Friendly") will expand that country's capacity to sell Certified Emission Reduction (CER) credits under

the Kyoto CDM system. Australia (which is the world's leading coal exporter and which generates 80 percent of its electrical power from coal) has also launched a major government-sponsored campaign to accelerate the development and commercialisation of CCS and related technologies.

The rapid implementation of clean coal technologies is an urgent matter in **China**, which is now the world's biggest coal consumer and which derives 70 percent of its energy from coal. China's coal reserves are noted for their high sulphur content, which combined with the slow adoption of desulphurisation systems have exacerbated the country's air pollution problems. China's reliance on dirty coal has heightened concerns over CO2 emissions, which at their present growth rate will surpass the combined levels of the advanced industrialised countries by 2030. Under the "common but differentiated responsibilities" provision of the United Nations Convention on Climate Change, China (along with India and other developing countries) is not liable to the numerical limitations of the Kyoto Protocol. As a result, China has surged past the United States as the world's largest producer of greenhouse gases.

Recent developments promise movement on China's energy problem. The Beijing government's fiscal stimulus package (at nearly $600 billion far larger relative to GDP than the stimulus programmes underway in Europe and North America) includes funds for sustainable energy. Meanwhile, foreign investors are pursuing advanced energy projects in China. South Africa's Sasol is developing a synthetic fuels capability in China, while America's Peabody Energy is launching the country's first CCS-capable coal plant.

Long-term, curtailing China's contribution to global climate change will hinge on (1) China's assent to a post-Kyoto agreement that clearly defines the country's responsibilities for mitigating global climate change, and (2) the ability of the Chinese government to formulate and execute a sustainable development strategy that strikes a balance between the exigencies of economic growth and the imperatives of greenhouse gas reductions.

With its strong natural resource base (wind, water, sun) and ample endowments of biofuel feedstocks (including perennial switch grasses that are ideally suitable for cellulosic ethanol), **Africa** is well positioned to leverage the worldwide growth of sustainable energy. But the region is seriously underperforming relative to its potential. Foreign direct investment in African energy remains concentrated in fossil fuels, and much energy-related FDI is directed towards countries (Nigeria, Sudan) with dismal human rights records. Africa is also a negligible player in the global carbon trading market, accounting for just three percent of the 1200-odd registered emission credit projects under the Kyoto Clean Development Mechanism. Of these, South African-based Sasol (the global leader in coal-to-liquid) has captured an outsized share of carbon trading credits.

Fuller exploitation of Africa's energy potential depends on (1) improvements in institutional/legal/regulatory conditions to enhance the region's attractiveness to foreign investors active in the renewable energy space, (2) expansion of the sustainable energy portfolios of Sasol, PetroSA, and other large regionally-based companies, and (3) acceleration of regional integration initiatives (e.g. the Southern Africa Development Community) to promote the development of a regional market for carbon credits.

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Guidance for Companies

In brief, global climate change promises dramatic changes in the environmental, regulatory, and competitive environment in which companies operate in coming years. Enterprise managers should undertake the following steps to strengthen their capacity to navigate these shifts:

- Tracking ongoing developments in environmental regulations (local, national, supranational) aimed at mitigating greenhouse gases
- Determining the measures (accounting, assurance, measurement, reporting) needed to comply with greenhouse gas-related regulations
- Assessing the potential impact of global climate change on the company's stakeholders
- Devising a carbon strategy to enable the company to withstand the effects of global climate change
- Specifying the corporate risks (economic, operational, competitive) arising from global climate change
- Devising the appropriate mixture of risk management instruments required to lower climate change-related threats to acceptable levels
- Evaluating the company's position in the technological landscape of sustainable energy
- Undertaking strategic acquisitions of advanced energy technologies
- Identifying possibilities for boosting energy efficiency within the organisation
- Formulating and executing strategies to exploit emerging growth opportunities in sustainable energy markets
- Capitalising on revenue generating opportunities in carbon emissions trading

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BIOGRAPHY

David Bartlett

David Bartlett, Economic Consultant, has over ten years' experience of consulting, researching and teaching on international corporate strategy. He specialises in international growth, global manufacturing, foreign sourcing and distribution and corporate risk management.

David's clientele includes multinational corporations and international financial institutions in North America, Europe, Asia-Pacific and the former Soviet Union.

Internationally recognised as an authority on financial sector development in Eastern Europe and the Soviet successor states, David is the author of a prize-winning book on the Hungarian transition and numerous articles on corporate strategy, international trade and investment and global finance.

David is Adjunct Professor of Strategic Management and Organization at the Carlson School of Management, University of Minnesota. He has also held faculty appointments at Vanderbilt University (USA), Yerevan State University (Armenia), and the University of World Economy and Diplomacy (Uzbekistan).

David has received a Fulbright Senior Scholarship, Salzsburg Seminar Fellowship and other scholarly awards. He holds a PhD and BA from the University of California and an MA from the University of Chicago.

David has authored a number of articles on behalf of RSM International and most recently completed the RSM International Global Business Forecast.