

Corporate Clean Energy Investment Trends in Brazil, China, India and South Africa



A report commissioned by the Renewable
Energy & Energy Efficiency Partnership



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About the Carbon Disclosure Project (CDP)

CDP, an independent, not-for-profit organisation, was launched in 2000 to collect and distribute high quality information that motivates investors, corporations and governments to take action to prevent dangerous climate change. We further this mission by harnessing the collective power of corporations, investors and political leaders to accelerate unified action on climate change.

2,500 organizations in some 60 countries around the world now measure and disclose their greenhouse gas emissions and climate change strategies through CDP, in order that they can set reduction targets and make performance improvements. This data is made available for use by a wide audience including institutional investors, corporations, policymakers and their advisors, public sector organizations, government bodies, academics and the public. For more information please see: www.cdproject.net

About the Renewable Energy & Energy Efficiency Partnership

The Renewable Energy & Energy Efficiency Partnership (REEEP) is a multi-stakeholder UN Type-II partnership headquartered in Vienna with five secretariats all over the developing world. By providing opportunities for concerted collaboration among its partners, REEEP aims to accelerate the marketplace for renewable energy and energy efficiency.

REEEP was initiated by the UK together with other committed governments, businesses and NGOs to deliver the World Summit on Sustainable Development (WSSD) commitments and beyond, in particular to take forward the key recommendations of the G8 Renewable Energy Task Force. It is now comprised of 300 partners including 46 governments, businesses and NGOs. As of April 2010, REEEP has supported 129 projects, targeting low-carbon energy interventions in renewable energy and energy efficiency covering 56 countries.

Foreword

Having been involved with both CDP and REEEP from their first beginnings, it gives me great pleasure to write the foreword to this report. Following COP15 at Copenhagen the countries that are covered in this report – now routinely known as the BASIC countries – have taken a powerful and prominent role in response to climate change. Indeed at the moment when these countries came together, along with President Obama, to form the core group that led to the Copenhagen Accord, there was a demonstrable power shift that the rest of the world took notice of.

The work that lies behind this report evidences a power shift in both senses of the word. One of the more remarkable features of the concept of distributed power – where renewable and energy efficiency combine most effectively – is the distribution of power in both its senses. To repeat for emphasis; distributed power distributes power. This can occasionally be an uncomfortable experience for those who benefit most from the status quo, but it is also the case that any shift away from existing power structures in the world favours those who in the recent past have not been dominant power producers.

This report provides data for a story which is unfolding, that is literally world changing. Out of these examples corporations will emerge that will thrive and prosper in a world where energy demand is rising and there is an absolute imperative to reduce greenhouse gas emissions. It has always been vain and arrogant to suggest that the technological solutions to climate change will inevitably emerge from the so called developed nations. Given the right policy frameworks and the capacity to take science and engineering skills and attach them to huge domestic as well as global markets, there is every chance that the technological break through that the world requires will emerge from these so called developing countries.

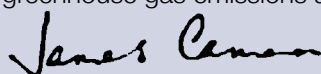
Indeed one of the positive features of the Copenhagen Accord with over 100 countries pledging domestic public policy intervention on climate change – with renewable energy and energy efficiency at the core – is that the increasingly absurd distinction between developed and developing countries has to some extent fallen away. All of the countries featured in this report have made pledges and they are not conditional on specific donations from the traditional donor nations.

The focus on the corporate response to climate change here is a further example of how the Carbon Disclosure Project plays a unique role by providing the mechanism for corporations all over the world to communicate strategic climate change information to Institutional Investors. CDP's database of corporate climate information is now, after many years of operation, an unparalleled source of information about private sector behaviour which has been stimulated by the owners of their businesses.

This project addresses an important question; how fast are companies in the BASIC countries acting to implement energy efficiency and renewable energy and how does government policy affect their investment decisions? Investment decisions that could be taken in London, New York, or Zurich, as well as in the capital centres that are increasingly influential within the BASIC countries.

The findings show that there are plenty of grounds for optimism and that private sector investment flows are being directed towards clean energy (both generation and efficiency savings). They also show that the theory that policy and regulation has an effect on corporate behaviour is correct, and that effect is largely positive. One example of a policy mechanism that has been well received is that of the Clean Development Mechanism (CDM). The CDM has created a flow of capital into clean energy investments, particularly but not exclusively in China, and together with that flow relationships have been built in key sectors of these economies, building trust and goodwill for future investments at a larger scale. Within the report there are suggestions from the corporations that have been interviewed for regulatory actions that are likely to be relatively more effective in driving behaviour change amongst their corporate peer group.

This work is a modest yet authoritative first step in understanding what is a very complex picture. The report creates a valuable baseline of knowledge about corporate priorities. It will assist policymakers, investors, and entrepreneurs alike to understand the scale of the market opportunity that presents itself in the face of the paramount necessity to reduce greenhouse gas emissions as we develop the global economy.



James Cameron, Executive Director and Vice Chairman, Climate Change Capital

Introduction

Background

This project was commissioned by the Renewable Energy & Energy Efficiency Partnership (REEEP) in 2009 with the purpose of identifying corporate best practices in promoting energy efficiency measures and the use and development of renewable energy in Brazil, China, India and South Africa (the “BASIC” countries). This report seeks to map the extent to which corporations in BASIC countries are investing in these areas, to identify the drivers for such investments and to evaluate the role of government policy.

The project has been conducted by the Carbon Disclosure Project (CDP). The primary data sources used for analysis were disclosures made by companies to CDP in 2009, and additional interviews carried out with companies in 2009-10.

In carrying out the project CDP has been greatly assisted by partner organizations in Brazil (Fabrica Ethica), China (Syn Tao), India (WWF India, Confederation of Indian Industry ITC Centre of Excellence for Sustainable Development) and South Africa (National Business Initiative). CDP would also like to thank Juliana Bond Werneck and Johan Munck af Rosenschold.

Methodology

CDP’s primary data source for the project has been disclosures made by companies in response to its annual Investor CDP information request. In 2009 CDP sent this request to thousands of listed companies all over the world on behalf of 475 institutional investors with US\$ 55 trillion of assets under management. The questionnaire includes topics related to greenhouse gas emissions, energy, risk and opportunity, corporate governance and investment to meet targets.

In order to obtain more detailed responses relating to energy investment and policy, CDP commissioned additional interviews with listed companies. Interviews were conducted by partner organizations in each of the four countries studied, and the results were collated by CDP. The list of companies to be interviewed was chosen in each country to be balanced across different sectors.

Company Sample

The sample of companies that receives the Investor CDP information request is always the largest listed companies by market capitalization in a particular country or region. This means that privately-owned and state-owned companies are not invited to respond to CDP, although some of these companies do respond voluntarily. Companies mentioned in this report are almost always listed companies.

In countries where power generation is largely conducted by state-run enterprises the CDP information request will have few responses from the Utilities sector. As a result very few of the companies mentioned in this report have large-scale power generation as their primary business activity, although some may be making significant investments in generation capacity.

Overall Findings

1. Companies in BASIC countries are making very sizeable investments in clean energy.

The scale of corporate investments in the four countries studied, particularly in China which is the world's largest investor in this area, is very large. These investments are being driven by regulation, but also by other purely business-led considerations such as cost reduction and energy security.

2. High-level policy signals are necessary and useful.

All four of the countries studied have framework legislation which sets out principles and aspirations for greater energy efficiency and use of renewable energy. These high-level signals can influence investment; they also create societal expectations which help to shape internal company policies.

3. In addition to high-level signals, clear and specific regulation is also needed.

Although high-level policy signals are useful, corporate investment decisions are most strongly influenced by regulation that provides very specific requirements and mechanisms for action. Recent work by Chatham House describes this as “investment grade” policy.

4. CDM has made a contribution, and consideration should be given to its future role.

The Clean Development Mechanism (CDM) has played an important role in incentivizing corporate investment, particularly for renewable energy. CDM's uncertain future may affect levels of corporate investment in BASIC countries.

“We expect the government to play the role of a proactive catalyst in ensuring that India follows a low-carbon growth trajectory. The government's role must be very strong in both, policy and direction setting as well as in setting up a fiscal regulatory regime of incentives and subsidies for clean energy.”

Wipro, India

“All these laws and regulations have shown the government's great determination in developing low carbon economy and renewable energy. The incentive policies have drawn China Merchants Bank to realize “Green is Green” – there are tremendous opportunities for low carbon economy.”

China Merchants Bank, China

“If a project becomes a CDM project then the returns will be even higher. All projects are implemented through a process to ensure that they could be eligible to qualify for CDM at a later stage.”

Investec, South Africa

Summary of Findings by Country

Brazil

Energy Efficiency

- Strong regulatory requirements for the energy sector are having an effect on corporate investment;
- In other industrial sectors policy and regulation exist, but are not currently playing a major role in corporate investment decisions;
- Companies would like to see good performance recognized, e.g. through a corporate energy efficiency index, or individual energy efficiency contracts with government.

Renewable Energy

- Biofuels policy and CDM have both encouraged investment by companies in Brazil;
- The cost of investment in renewable energy can be high, and many policy suggestions made by companies are focused on bringing down the cost of renewable power generation, e.g. through a special tariff, renewable energy credits, or reduced transmission costs for smaller renewable energy generators;
- Companies expect to see new renewable energy policy measures resulting from Brazil's National Action Plan on Climate Change.

China

Energy Efficiency

- High-level policy signals have been effective in stimulating investment. However there is an appetite for more specific regulation which applies to a larger number of companies;
- Green finance measures have been effective in shifting investment flows at a large scale;
- As in Brazil, companies would like to see measures that provide incentives or recognition for good energy efficiency performance.

Renewable Energy

- National policy on renewable energy has provided a clear signal to companies and has stimulated investment;
- CDM has acted as a spur to corporate investment, both directly (e.g. for project development) and indirectly (e.g. new business areas for service companies);
- Companies would like to see innovation in energy market structure and demand management, e.g. a renewable energy generation obligation, a renewable energy or emissions trading market, generation-based subsidies.

India

Energy Efficiency

- Regulation is a strong driver of corporate energy efficiency investment, and companies expect to see new measures resulting from the National Enhanced Energy Efficiency Mission;
- CDM also plays an important role in driving investment for some companies;
- Companies would like to see government create more energy efficiency standards and product efficiency ratings.

Renewable Energy

- Regulation plays a particularly strong role as a driver for investment in this area, and companies expect to see new measures resulting from the National Solar Mission;
- Investments are being made by a wide range of industrial sectors, and not only by the power generation sector;
- Companies would like to see more government support for the full range of the technology cycle, including Research and Development (R&D) support, capital subsidies, generation incentives and standards.

South Africa

Energy Efficiency

- Energy efficiency is a high priority for South African companies, and energy security and cost reduction are key drivers for this;
- The voluntary Energy Efficiency Accord appears to have worked well in setting expectations for corporate behaviour but may have been insufficiently ambitious;
- Companies are making preparations for the emergence of a new energy efficiency tax incentive and for the proposed Power Conservation Program.

Renewable Energy

- Some companies anticipate that the Renewable Energy Feed-in Tariff (REFIT) generation incentives will change their investment patterns, however there is uncertainty about how this regulation will be applied;
- CDM is an important driver for investment by some companies;
- Companies would like to see R&D support, simplification of planning consents, renewable energy targets and in-country support for CDM project development. Technology-specific measures are not favoured.

International Comparisons

2009 national investment in clean energy

- Clean energy investment in China is higher than in any other country in the world, and dwarfs the levels of investment seen in the other BASIC countries.
- Levels of investment in South Africa are the lowest in the group. Corporate investment levels should rise in the future, given the strength of the cost and energy security drivers (see below).

	Spend US\$ billion
Brazil	7.4
China	34.6
India	2.3
South Africa	0.125

Source: Pew Charitable Trusts (2010)

Drivers of corporate investment in energy efficiency

Key points:

- Internal company policies are an important driver for investment in all countries;
- Current and expected future regulation also plays a strong role, particularly in Brazil and China;
- Cost reduction and energy security are strong drivers for corporate energy efficiency investments in South Africa;
- Incentives (including CDM) do not appear as a leading driver for investment even though China is home to a greater number of CDM projects than any other country – other factors appear to be more important in decision-making.

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security
Brazil	100%	83%	67%	100%	67%
China	73%	73%	18%	82%	64%
India	83%	67%	67%	100%	33%
South Africa	100%	64%	64%	100%	82%

Percentages represent the proportion of companies interviewed for this report. Total number of interviewed companies: Brazil (6), China (11), India (6), South Africa (11)

Drivers of corporate investment in renewable energy

Key points:

- Scores are lower overall than for energy efficiency – this is because almost every company invests in energy efficiency, but not all invest in renewable energy;
- Internal company policies are a strong driver for investment in all countries;
- The importance of regulation as a driver for investment varies greatly by country. This variance cannot be explained simply by the quantity of existing regulation in each country but must relate to expectations of impacts from future regulation. Notably, India has a high score in this area even though its regulatory regime for renewable energy is still evolving. Brazil's lower score may reflect the fact that existing levels of renewable energy are high, and the effect of previous regulation has already been felt;
- Cost reduction and energy security both play a fairly strong role, particularly in South Africa.

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security
Brazil	33%	17%	33%	50%	33%
China	55%	55%	45%	64%	55%
India	50%	83%	33%	83%	50%
South Africa	64%	64%	73%	100%	82%

Percentages represent the proportion of companies interviewed for this report. Total number of interviewed companies: Brazil (6), China (11), India (6), South Africa (11)

Key regulations mentioned by companies as influencing their investments

Companies mentioned a wide range of regulations, but those which were mentioned particularly often by companies were usually in the area of energy efficiency. This may partly reflect the relatively small number of large-scale energy generating companies included in the response sample.

	Regulation (current or future)	Energy Efficiency	Renewable Energy
Brazil	Energy market requirements under ANEEL and PROCEL	X	
China	11th Five -Year Plan for the Energy Development Planning of China		X
India	Enhanced Energy Efficiency Mission	X	
South Africa	Power Conservation Program, Energy Efficiency Tax Incentive	X	

Brazil

Country background

Key energy measure	
Renewable energy capacity 2009	9.1 GW
Renewable electricity capacity as % of total generation capacity	9.8%
5-year growth rate in renewable energy	13.9%
Key renewable energy sectors	Ethanol, biomass, small hydro
National clean energy investment 2009	US\$ 7.4 billion

Source: Pew Charitable Trusts (2010)

	Includes large-scale energy generators?	Includes intensive energy users?	Includes large-scale energy investors?
Responses to CDP 2009	Yes	Yes	Yes
Interviews 2010	Yes	Yes	Yes

Data sources used

In 2009 78% of the largest 80 listed companies in Brazil responded to CDP's climate change information request. CDP has sent its Investor information request to Brazilian companies since 2006. CDP's partners in Brazil are Fábrica Ética, Grupo Santander and ABRAPP (Association of Brazilian Pension Funds).

In 2010 additional interviews were conducted with 6 listed companies.

1. Banco do Brasil (Diversified Financials)
2. Natura (Household and Personal Products)
3. CPFL Energia (Electric Utilities)
4. AES Eletropaulo (Electric Power Companies)
5. Companhia Brasileira de Distribuicao (Food and Staples Retailing)
6. Fibria (Pulp & Paper)

The total company sample provides a good overview of different types of corporate involvement in clean energy.

CDP and its partners had difficulty in persuading Brazilian companies to be interviewed. Brazilian companies showed a low level of interest in discussing this topic; we therefore suggest that government should consider motivating companies to share their views and knowledge.

Brazil: policy background

Main Energy Efficiency Policies

Utility Energy Efficiency Obligation (1998)

Concession contracts signed between electric power distribution companies and the Brazilian energy regulator ANEEL establish their obligations and responsibilities. One of these is to annually invest an amount not less than 0.5 % of the company's net operational revenue in activities aimed at reducing inefficient use of electricity.

ANEEL obliges electricity distribution companies to make investments that reduce inefficient use of electricity, including investment in energy efficiency measures. Since 2005, a minimum of 50% of investments must be allocated to low-income energy efficiency programs. Utility investments totalled US\$ 130 million in 2005-06 and US\$ 80 million in 2006-07. Industry programs made up 15% and 6% respectively, while other programs accounted for 22% and 28%.

The main laws and resolutions related to ANEEL are:

- Law No 9.991, 24/07/20003: determines issues related to investments in research and development and in energy efficiency on the part of concessionaires, permissionaires and authorized companies of the electric power sector, and sets out other measures.
- Law N° 11.465, 28/03/20074: adapts Law 9.991, extending the obligation to December 31, 2010 for concessionaires, permissionaires and authorized companies of the electric power sector to invest, at minimum, 0.50% of their net operational revenue in activities aimed at reducing energy losses.
- Resolution Aneel n° 300, 12/02/20085: establishes criteria for resource application within Energy Efficiency Programs.
- Law N° 12.212, f20/01/20106: determines the Social Tariff for electricity.

PROCEL – National Electrical Energy Conservation Program (1985)

PROCEL's objectives are to reduce inefficiency in electricity use, and to seek energy efficiency in the electricity sector. The program offers training courses, seminars, and conferences to industrial and commercial consumers, concession-holder staff and public organizations to combat energy waste. PROCEL also helps utilities obtain low-interest financing for major energy efficiency projects from a revolving loan fund within the Electric Utilities sector.

National Policy on Climate Change (2009)

In December 2009 the government of Brazil approved the National Policy on Climate Change, including the creation of a voluntary national emissions reduction target of reducing between 36.1% and 38.9% of projected emissions by 2020. Approximately half of these reductions are expected to come from improved energy efficiency in construction, farming, and industry.

Brazil's National Climate Change Plan (2008) includes the following goals relating to energy efficiency:

- Implementation of the National Policy for Energy Efficiency that will result in a gradual energy saving up to 106 TWh/year to be reached in 2030, avoiding emissions of around 30 million tons of CO₂ in that year;
- Reduction of non-technical losses in the electricity distribution at a rate of 1,000 GWh per year over the next ten years. This will represent a reduction in energy wastage of 400 GWh per year.

Main Renewable Energy Policies

PROINFA : Program of Incentives for Alternative Sources of Electric Energy (2004)

This program aims to increase the participation of wind, biomass and small hydroelectricity plants (SHP) in the National Electric System. All energy produced under the program benefits from guaranteed 20-year supply contracts with Eletrobrás.

Brazil's Hydropower Programme (2004)

Hydropower projects under this program sell their power at public auction. Contracts are agreed between distribution utilities and project developers, and generators benefit from a guaranteed 15-30 year Power Purchase Agreement.

Electric Power Auctions for Biomass (2008) and Wind (2009)

Under the New Model regulatory structure introduced in Brazil in 2004, most new power projects participate in auctions for long-term power purchase agreements (PPAs) with energy distributors organised by Brazil's electricity regulatory agency (Agência Nacional de Energia Elétrica, ANEEL). Energy distributors are required to enter into long-term contracts for all of their electricity demand via a reverse auction system.

Under the auction system, there are specific auctions for existing energy sources, and those for new energy sources, including renewable energy. ANEEL also carries out reserve energy auctions, designed to purchase additional energy supply for the National Integrated System (SIN) in order to reduce operational costs of the system.

Mandatory Biodiesel Requirement (2005)

This law establishes the requirement for biodiesel – a mix of vegetable oil and sugar-cane ethanol – to be blended with standard diesel. Between January 2008 and January 2010 the mandatory biodiesel blending content was increased to 5%.

The National Economic and Social Development Bank (BNDES) provides financial support for investments in biodiesel. One of these measures is a 25% extension in the total loan payoff period for the purchase of machinery that uses at least 20% biodiesel fuel.

National Climate Change Plan (2008)

Brazil's National Climate Change Plan includes the following goals relating to renewable energy:

- Charcoal: increase consumption of sustainable charcoal to replace coal in steel plants, mainly through the encouragement of forestation in degraded areas;
- Solar Heating: encourage the use of water solar power heating systems, reducing electricity consumption by 2,200 GWh per year by 2015;
- Hydroelectricity: 34,460 MW from new hydropower plants to be added to the system in accordance with the schedule of works of the Ten Year Energy Plan (2007-2016);
- Energy from wind and sugarcane bagasse: increase the share of these sources in the electric matrix through auctions of renewable energy. More than 7,000 MW of renewable sources will be implemented by 2010 in accordance with the results of PROINFA and the auctions already carried out;
- Photovoltaic Solar Energy: seek the expansion of the national photovoltaic industry and the use of this energy source in systems that are both isolated and grid-connected;
- Ethanol: encourage industry to achieve an average annual consumption increase of 11% in the next ten years; technical co-operation with other countries.

Brazil: information from companies

Energy Efficiency

How much money do companies invest, or plan to invest, in energy efficiency?

Brazilian companies are investing very large sums in energy efficiency.

Company	Disclosed spend	Purpose of spend
Companhia Brasileira de Distribuicao	The company has already invested an average of R\$17 million (US\$ 9.6 million) per year since 2004 and plans to invest R\$21.5 million.	Various projects within company operations
Natura	R\$ 500,000 (US\$ 283,000) per year with the aim of maintaining this rate of investment into the future (total includes some spend on renewable energy)	<ul style="list-style-type: none"> • Use of prismatic domes for lighting in some administrative sectors; • Several projects for reducing energy matrix (electricity, natural gas and oil) in air-conditioners, compressed air and processes.
CPFL Energia	R\$ 51 million (US\$ 29 million) of existing spend described. In addition this company is under a regulatory obligation to invest 0.5% of operational revenue to reducing electricity losses.	Various projects within company operations
AES Eletropaulo	R\$325 million (US\$ 184 million) since 1998, R\$40 million spend planned for 2010.	Demand side efficiency in commercial and domestic buildings.

How far in advance do companies plan investments?

Investments by interviewed companies are made in the short term, or opportunistically.

- 4 companies plan investments on an annual basis;
- 1 company indicated a 2-year planning cycle;
- Banco do Brasil said, "The time is defined by the goal of maintaining a substitution rate for old equipment, when it has reached the end of its operational life. The company tries to keep a virtuous cycle with constant gains in energy efficiency."

What is the required payback?

Answers to this varied, but required payback periods were generally longer than the planning cycle. Requirements within different companies included:

- 18 months
- 1-2 years with a maximum of 3 years
- 3 years with no minimum Internal Rate of Return (IRR)
- 4 years with an attractive IRR
- No minimum payback, but various factors taken into account, including cost-benefit of project, life cycle cost of new equipment, and amount of saved energy at base load and at peak time.

What drives companies to invest in energy efficiency?

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security	Other
Banco do Brasil	X	X	X	X	X	
Natura	X			X	X	
CPFL Energia	X	X	X	X	Under review	Community outreach, e.g. attracting low-income customers.
AES Eletropaulo	X	X	X	X		
Companhia Brasileira de Distribuicao	X	X	X	X	X	
Fibria	X	X		X	X	
Total	6	5	4	6	4	

Has government regulation influenced companies to invest in energy efficiency?

Despite listing regulation as a contributing factor in investment decisions, interviewed companies which responded in more detail tended to play down the importance of this factor. For example, Natura said, “No governmental law has until now had a major influence in the company’s decision on energy efficiency.” CPFL Energia said, “The business strategy for energy efficiency is built not only based on governmental regulation, but also taking into consideration other factors.” Eletropaulo said, “The Company goes beyond compliance in energy efficiency investments.”

Fibria proved an exception, saying: “There is always a concern to be up-to-date regarding new regulations, which are part of climate change policy. All regulations can generate risks; however, they can also generate opportunities for the company.”

Which regulations have been influential, and what effect did they have?

Banco do Brasil mentioned using basic environmental laws, including the section of the Brazilian constitution which deals with environmental principles (Article 225), as a framework within which to operate.

3 interviewed companies mentioned energy market requirements under ANEEL and PROCEL, together with Law 9991/00 which requires utility companies to implement energy efficiency programs. These requirements are clearly effective at stimulating investment in the energy sector. However, CPFL Energia said, “PROCEL need improvements to be more attractive to the private sector, in particular to manufacturing companies that don’t show interest in energy efficiency programs. Normally industries don’t think about energy efficiency when production is going well, but only when profits are coming down.”

Are there any particular government measures that would influence companies to invest more in energy efficiency?

Interviewed companies had numerous suggestions on how government policy might influence further investment. Suggestions included:

- Create an energy efficiency index for Brazilian companies, and link this to financial liabilities with rewards for greater efficiency. This could be comparable to the existing scheme which links employee accident rates to the level at which companies need to pay the Workers Accident Insurance Contribution;
- Energy consumption contracts between the government and companies (including partner activities and outsourced operations), with a bonus and penalty system for good or bad performance;
- Tax reduction/optimization in return for good performance on energy efficiency.
- Support for university research into energy efficiency, energy efficiency R&D, development of new efficient technologies for use by low-income households;
- Educational program, working with industry associations, with a particular focus on small companies;
- Encouraging training of energy management professionals, and the establishment of this profession within companies;
- Financing for energy audits and retrofit programs;
- PROCEL stamp of approval for energy-efficient products;
- Eventual prohibition of certain products, e.g. incandescent lighting.

Renewable Energy

How much money do companies invest, or plan to invest, in renewable energy?

Answers to this question were primarily from the energy sector. A number of the interviewed companies did not feel that they were actively investing in renewable energy.

Company	Disclosed spend	Purpose of spend
AES Eletropaulo	R\$28.6 million (US\$ 16.2 million) in the last two years	Renewable energy generation
Companhia Brasileira de Distribuicao	R\$2.5 million (US\$ 1.4 million)	Purchasing renewable electricity in accordance with ANEEL regulation

Industrial companies that reported to CDP in 2009 had made numerous investments in on-site electricity generation, often using waste or by-products. For example:

- VCP, a company in the paper and pulp sector, produces 80% of its own energy by burning biomass and black liquor;
- The Bandeirantes thermoelectric plant, managed by Itaú Unibanco, was the first biogas-fuelled generation plant in Brazil and was the world's largest at the time of its construction in 2003;
- Companies in the sugarcane sector are typically self-sufficient in energy and use bagasse biofuel (a by-product of the sugar-making process) to meet their needs;
- Numerous companies reported converting their vehicle fleets to use biodiesel or ethanol fuel.

In interviews and CDP responses, few Brazilian companies reported purchasing renewable power, although Natura did report direct purchase of renewable electricity through a bilateral contract. This is due to the structure of the electricity market in Brazil - almost 75% of power is generated from hydroelectric sources (i.e. grid electricity is already largely renewable), and corporate electricity purchases are made at government-backed auctions. For example, Companhia Energética De Sao Paulo (CESP) reported: "CESP as a low carbon hydroelectric energy generator... commercializes its electric energy production based on rules and auctions promoted by the Brazilian government...The commerce of renewable energy exchange certificates of low carbon electricity (zero carbon) is not practiced in Brazil."

How far in advance do companies plan investments?

Answers to this ranged between 1 and 5 years (individual responses included 1 year, 1 to 4 years, 18 months and 5 years).

What is the required payback?

Responses varied although timescales were fairly short. 1 company requires an 18 month payback and another requires a payback within 3 years. 1 company said that payback requirements were variable, and 1 company said that payback was measured in terms of Net Present Value (NPV) rather than time (but did not give a threshold figure).

What drives companies to invest in renewable energy?

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security	Other
Banco do Brasil						See note below table
Natura	X			X	X	
CPFL Energia	X	X	X	X	X	Reducing greenhouse gas emissions
AES Eletropaulo			X	X		
Companhia Brasileira de Distribuicao						
Fibra						
Total	2	1	2	3	2	

NB: Banco do Brasil noted that it does not have specific contracts for renewable energy supply and typically uses electricity supplied by the local electricity company, however due to the generation profile of the Brazilian power sector it is able to confirm that almost all of the electricity that it buys is generated from hydroelectric facilities. The same point will apply to other corporate electricity purchases in Brazil.

Has government regulation influenced companies to invest in renewable energy?

Answers provided by interviewed companies suggest that regulation is not usually a major consideration in investment decisions. When asked to go into detail on this subject no company provided any further evidence of regulation as a factor. However, specific examples given by companies suggest that regulation can play a role in corporate decisions (see next section).

This is supported to some extent by disclosures made to CDP by Brazilian companies in 2009, which generally do not mention regulation in connection with investments, although at the same time it is clear from some of their listed actions that government policies (e.g. to promote the use of biofuels in vehicle fleets) have influenced their decisions.

In interviews, one company listed a range of factors that were more important than regulation, one said that internal company policy was the main driver for investment, and one said that the high levels of renewable energy already used in Brazil made regulation unlikely.

Which regulations have been influential, and what effect did they have?

Banco do Brasil listed government support for clean energy generation, as seen in recent ANEEL auctions for electricity from wind and hydropower, as a regulatory measure that would encourage them to invest, and CPFL Energia suggested holding new auctions. From this it seems reasonable to assume that the renewable energy auctions which have already taken place were seen by companies as being effective.

In their 2009 reports to CDP many companies reported that they were involved in CDM projects relating to renewable energy, e.g. small hydroelectric, co-generation. This measure appears to act as a particular spur to investment in renewable energy in Brazil, as very few companies mentioned involvement in CDM projects that had an energy efficiency focus.

When reporting to CDP many companies mentioned the National Plan on Climate Change. However there were no clear attributions of company action to the plan. This would suggest that its main effect so far has been to set expectations of future regulation and to create high-level policy signals.

Are there any particular government measures that would influence companies to invest more in renewable energy?

Interviewed companies suggested a number of policy measures which might help to influence them to invest in renewable energy. These included:

- Changes to electricity market structure, enabling direct negotiation between buyers and sellers;
- Product certification/tax incentives for companies that use renewable energy in their manufacturing;
- Reducing the cost of renewable energy generation, e.g. through subsidizing operational costs, creating a special tariff for renewable electricity, putting in place credits for renewable energy, expanding the existing system of reduced transmission costs for smaller renewable energy generators to larger plant;
- Supporting the development of smart grids.

China

Country background

Key energy measure	
Renewable energy capacity 2009	52.5 GW
Renewable electricity capacity as % of total generation capacity	4%
5-year growth rate in renewable energy	78.9%
Key renewable energy sectors	Wind, Biomass, Solar PV
National clean energy investment 2009	US\$ 34.6 billion

Source: Pew Charitable Trusts (2010)

	Includes large-scale energy generators?	Includes intensive energy users?	Includes large-scale energy investors?
Responses to CDP 2009	No, but includes transmission/distribution and plant manufacture	Yes	Yes
Interviews 2010		Yes	Yes

Data sources used

In 2009 11% of the largest 100 listed companies in China responded to CDP's climate change information request. CDP has sent its Investor information request to Chinese companies since 2008. Companies in China are relatively unaccustomed to making voluntary disclosures on these topics, and although response rates are increasing fast they are still low compared to other geographies where CDP operates.

In 2010 interviews were conducted with 11 companies:

1. State Grid Corporation of China (Utilities)
2. China Merchants Bank (Financial Sector)
3. Gree Electric Appliances (Household Appliances)
4. Novozymes China (Pharmaceuticals)
5. Beijing Deqingyuan Agricultural Science and Technology Company (Agricultural Products)
6. Guodian Union Power Technology (Energy)
7. China Vanke Company (Real Estate)
8. Company 1 (Automotive)
9. Company 2 (Energy Equipment & Services)
10. Company 3 (Automotive Equipment)
11. Company 4 (Household Appliances)

The total company sample provides a good overview of different types of corporate involvement in clean energy, although large-scale power generation is not included.

China: policy background

Main Energy Efficiency Policies

Energy Conservation Law (1998)

This law sets out principles for energy conservation in industry, including the Construction, Transportation and Utility sectors.

Medium- and Long-term Energy Conservation Plan: 10 Energy Conservation Programs (2004)

The Medium and Long-term Energy Conservation Plan covers the 2005-10 and the 2010-20 period. It details energy conservation aims and implementation plans to be undertaken during the 11th five year period (2006-10) and beyond. The Plan puts emphasis on ten key energy conservation projects in high-emitting sectors.

Top 1000 Industrial Energy Conservation Programme (2006)

The objective of the programme is to reduce the energy intensity of the 1000 largest industrial consumers, which account for 47% of total energy consumption. These include the energy production, iron and steel, chemical industry, textile, coal, construction material and paper sectors among others.

Comprehensive Working Program on Energy Saving and Emission Elimination (2007)

This confirms the goal for the Eleventh Five Year Plan, to reduce energy intensity by 20%, and reduce waste emission by 10%

Green Credit and Green Securities (2007)

The Green Credit policy prevents banks from lending money to companies that cause serious environmental pollution. The Green Securities policy forces companies in 13 heavy polluting industries to pass an environmental assessment prior to seeking stock exchange listing via an Initial Public Offering (IPO) or refinancing, and regulates listed firms to regularly release information about their environmental performance.

National Climate Change Program (2007) and 2009 greenhouse gas emissions target

The National Climate Change Program outlines the impacts that China faces from climate change, and sets out a strategy to address them during the Eleventh Five Year Plan, which runs from 2006 to 2011. China aims to reduce energy consumption per unit of GDP by 20% by 2010 and to quadruple GDP between 2000 and 2020 while only doubling energy use. In November 2009 the Chinese government announced that it would reduce the intensity of carbon dioxide emissions per unit of GDP in 2020 by 40 to 45% compared with 2005 levels.

The Limit Value of Energy Efficiency and the Levels of Energy Efficiency of Room Air Conditioners (2010)

This national standard improves the threshold limit for energy efficiency in air conditioning units by 23% and will be implemented on June 1st, 2010.

Fiscal Support for Energy-saving Products (2009-2010)

In 2009 the Chinese government provided fiscal support for energy-saving lamps and energy-efficient air conditioners. In 2010, the government will continue this policy and extend the support to energy-saving cars, electric motors and other products.

Notice on the Launch of Pilot Project of Demonstration and Promotion of Energy-saving and New Energy Cars (2009)

This pilot project demonstrates and promotes the use of energy-saving and new energy cars in 13 cities: Beijing, Shanghai, Chongqing, Changchun, Dalian, Hangzhou, Jinan, Wuhan, Shenzhen, Hefei, Changsha, Kunming and Nanchang, and creates a one-off subsidy.

Main Renewable Energy Policies

China's policies on renewable energy development fall into three categories. China's central government establishes the first two levels of policy. Local governments, including provincial, municipal, and county governments, establish the third level of policy with overall direction from the central government.

Renewable Energy Law (2005)

This law established five important measures: a national target of 10% renewable energy by 2020, grid connection priorities, classification of renewable electricity tariffs, a special fund for renewable energy, and policy for favourable credit and tax treatment. Power grid operators are required to purchase resources from registered renewable energy producers. The law also offers financial incentives, such as a national fund to foster renewable energy development, and discounted lending and tax preferences for renewable energy projects.

Medium and Long-term Development Plan for Renewable Energy (2007)

The Plan calls for the percentage of renewable energy to rise to 10% of total energy consumption by 2010 and 15% by 2020. An investment of CNY 2 trillion (approximately US\$ 263 billion) by 2020 into renewable energy development in China is envisaged.

Eleventh Five Year Renewable Energy Development Plan (2008)

This plan sets the priority sectors for renewable energy development in China up to 2010 and 2020 as follows:

- Hydropower: By 2020, China's installed capacity will reach 300 GW;
- Biomass Energy: By 2020, the installed capacity of biomass power will reach 30 GW, annual use of biomass pellets for fuel will reach 50 million tons, annual use of biogas will reach 44 billion m³;
- Wind Power: By 2020, the installed grid-connected wind capacity will be 30 GW;
- Solar Power: By 2020, the total capacity of solar power will be 1.8 GW.

Amendment of the Renewable Energy Law (2009)

The amendment creates a system guaranteeing the purchase of electricity generated by using renewable energy. It identifies the organizations which will supervise these purchases, and establishes a renewable energy development fund. This amendment will come into effect on April 1st, 2010.

Support for wind generation

Since 2003, many wind projects have benefited from the Wind Power Concession Program. Domestic and international companies are invited to bid for relatively large-scale potential projects (100-200MW). Successful bidders are selected according to the price per kWh of wind electricity proposed and the share of domestic components utilised in the wind farm. The wind concession lasts for 25 years and the bid price is guaranteed as a feed-in tariff for the first 30,000 full load hours achieved (for a 100 MW project, this amounts to approximately 3 billion kWh). Depending on the site's wind resource, this could cover about 10-15 years.

In August 2008, the Ministry of Finance issued an incentive policy on funding support for the commercialization of wind power generation equipment. According to this regulation, for all the domestic brands (with over 51% Chinese investment) the first 50 wind turbines over 1 MW will be rewarded with RMB 600/kW (60 Euro) from the government. The rule specifies that the wind turbines must be tested and certified by China General Certification (CGC), and must have entered the market, been put into operation and connected to the grid. The regulation further requires that the rewarded turbines must use domestic manufactured components and share the awards proportionate with component manufacturers.

China: information from companies

Energy Efficiency

How much money do companies invest, or plan to invest, in energy efficiency?

Interview responses showed that Chinese companies are prepared to invest very large sums in energy efficiency.

Company	Disclosed spend	Purpose of spend
Company 1	> RMB 100 billion (>\$US 14 billion)	Largely used to purchase advanced manufacturing facilities that will lower energy consumption
China Merchants Bank	>RMB 50 million (>\$US 7.3 million)	Special loans for energy efficiency projects
Gree Electric Appliances	c.RMB 50 million (\$US 7.3 million) >RMB 1 billion (\$US 146.4 million)	Energy efficiency in production Product efficiency improvements
China Vanke Co	RMB 50-100/m2 (\$US 7-15/m2)	Meeting enhanced energy-saving standards. 6 million m2 to be developed in 2010.
Guodian Union Power Technology	RMB 1 billion (\$US 1.4 billion)	New energy-efficient plant

How far in advance do companies plan investments?

A number of companies explained that energy efficiency had been a high priority for several years. The year when the issue started to be seen as strategic was typically somewhere between 1999 and 2006.

What is the required payback?

In answer to this question most companies pointed out that as well as costs, non-financial considerations were important in energy efficiency investment decisions, e.g. compliance, reputation, energy-saving and environmental benefits.

What drives companies to invest in energy efficiency?

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security	Other
State Grid Corporation of China		X		X	X	
China Merchants Bank	X	X		X	X	
Gree Electric Appliances	X	X	X	X	X	
Novozymes China		X		X	X	
Beijing Deqingyuan Agricultural Science and Technology Company	X			X		
Guodian Union Power Technology	X				X	
China Vanke Company		X		X		"Green Company" is the company's mission and its path to future competitiveness.
Company 1	X	X	X	X	X	
Company 2	X				X	Saving energy is fundamental to the survival of companies.
Company 3	X	X		X		
Company 4	X	X		X		
Total	8	8	2	9	7	

Has government regulation influenced companies to invest in energy efficiency?

Most companies stated that regulation was a factor in their investment decision-making. For some respondents the effect of government policy on corporate behaviour is clear. For example, Company 4 said, "Policies imply that the improvement of the product's performance in energy and environment and the improvement of level of energy production and resources utilization has become a must. Enterprises, as the main body of responsibility, must perform the duty."

For some other respondents, further regulation would be welcomed. Beijing Deqingyuan Agricultural Science and Technology Company said, "At present, the government encourage the voluntary actions of enterprises, but there are no relevant standards yet." China Merchants Bank noted that there is "no clear law or regulation launched on industry energy saving, yet."

Which regulations have been influential, and what effect did they have?

Several surveyed companies mentioned the Energy Conservation Law. Other regulations mentioned included the Eleventh Five Year Plan, the Electric Power Law of the People's Republic of China, the Circular Economy Promotion Law of the People's Republic of China, Guidance for Strengthening the Electric Demand Side Management, and Policy for Energy Efficiency in Buildings.

7 out of 11 companies that reported to CDP stated that they had a corporate energy efficiency or emissions reduction plan in place, and 5 reported a quantitative target. Of those, 2 stated a 5-year target against a 2005 baseline, in line with the Eleventh Five Year Plan.

1 company making a non-public disclosure to CDP reported signing a strategic co-operation agreement with the Ministry of Science and Technology to promote energy saving and emissions reduction projects. A different company making a non-public disclosure reported working with the French government development agency AFD to provide credit for investment in energy efficiency through the Energy Efficiency Credit Lines program.

China's Green Credit and Securities policies were seen to have an influence in reports to CDP. Out of two banks, "Bank A" and "Bank B" that made non-public disclosures to CDP in 2009, Bank A reported that by the end of 2008 almost 100% of its corporate clients had been certified as environmentally friendly by regional environmental protection departments. In the same period Bank A had suspended finance to 146 corporate clients which were subject to potential environmental risk. The amount frozen totalled RMB 5.125 billion of loans. Bank A issued loans totalling RMB 49.153 billion for energy saving and environmental protection projects in 2008, a growth in lending of 69.17% compared to the previous year.

Bank B provided more than RMB 20 billion in loans for the development of wind power, hydropower, bio-energy, geothermal and other renewable energy projects. The same bank also reported that since 2006 it had issued loans of more than RMB 4 billion for projects related to energy savings and emissions reductions, resulting in reduced emissions of 15 million MtCO₂.

Are there any particular government measures that would influence companies to invest more in energy efficiency?

There was some appetite for mandatory regulation and regulatory enforcement. Novozymes said, "Local governments mainly focus on some large companies and leading some model programmes. Considering that some company may not be able to survive under strict policy, no mandatory policy or measures have been launched. From Novozymes's viewpoint, we hope that the government can gradually lift up the standard for energy efficiency management and set more forcible index and norms for companies."

Other policy recommendations included:

- Recognition/appreciation awards for innovation in energy efficiency;
- Incentives for companies with higher energy efficiency;
- Encouraging and stimulating green production and consumption;
- Policies and standards adjusted to recognize the capabilities of different industrial sectors and company sizes.

Renewable Energy

How much money do companies invest, or plan to invest, in renewable energy?

Companies in China are investing large sums in the development of renewable energy. The type of activities mentioned covered a very wide range including purchase of renewable energy, manufacture of equipment, and provision of investment funds.

Company	Disclosed spend	Purpose of spend
China Vanke Co	Total of RMB 35 million (US\$ 5 million)	Solar PV systems at company facilities
Novozymes	"Tens of millions of dollars" of investment planned	Purchase and generation of renewable electricity
China Merchants Bank	RMB 3.16 billion (US\$ 463 million)	Loans for wind power, solar energy and biomass projects
Company 9	RMB 500 million (US\$ 73.2 million)	Manufacture of renewable energy generation components
Beijing Deqingyuan Agricultural Science and Technology Company	RMB 60 million (US\$ 8.8 million)	Electricity generation from chicken manure and sewage biogas

How far in advance do companies plan investments?	What is the required payback?
Companies tended to answer by saying how long they had been treating renewable energy as an investment priority. Start dates mentioned for this were all within the last 5 years. Novozymes said that the financial crisis had acted as a trigger for investment in this area, and that "the great gap of energy has drawn Novozymes's attention to the renewable energy investment."	Only Guodian Union Power Technology provided a specific answer, saying "Our rate of return on investment is between 26% and 27%. Return on net worth is about 30%. We hope that we can maintain at more than 10% in future."

What drives companies to invest in renewable energy?

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security	Other
State Grid Corporation of China	X	X		X	X	
China Merchants Bank		X	X	X	X	
Gree Electric Appliances						
Novozymes China		X		X		
Beijing Deqingyuan Agricultural Science and Technology Co	X	X	X	X		
Guodian Union Power Technology					X	GUPT is now on its way to building two wind power plants itself. GUPT will try out the equipment itself before the product (equipment for wind power generation) enters the market.
China Vanke Company	X		X	X		
Company 1	X	X	X	X	X	
Company 2	X				X	
Company 3	X	X	X	X	X	
Company 4						
Total	6	6	5	7	6	

Has government regulation influenced companies to invest in renewable energy?

The response to this was mixed, but companies which were active in the area of renewable energy tended to say yes.

Which regulations have been influential, and what effect did they have?

Regulations mentioned included the Law of the People's Republic of China on Renewable Energies, Mid-Long term Development Plan for Renewable Energy, the Eleventh Five Year Plan for the Energy Development Planning of China and other incentive policies on wind power, solar energy and biomass energy launched by government departments on all levels. China Vanke Co said that it had benefited from the Golden Sun incentive scheme for the deployment of 500 MW of large-scale solar PV projects.

The provision of a clear market signal is an important effect. China Merchants Bank said, "All these laws and regulations have shown the government's great determination in developing low carbon economy and renewable energy. The incentive policies have drawn China Merchants Bank to realize "Green is Green" - there are tremendous opportunities for low carbon economy."

The CDM was mentioned by 2 of the interviewed companies and was also mentioned in a number of corporate disclosures to CDP, so it seems clear that it has been stimulating corporate activity. China Shenhua Energy reported recent implementation of three energy-related CDM projects based on the use of gas and wind turbines, and supercritical power generation technology. The combined emissions reduction from these projects is estimated at 1.087 MtCO₂e. Another company which made a non-public response to CDP provides services to CDM project developers, helping Chinese clients to find international buyers. This is part of a wider suite of clean energy financing activities which match-make foreign corporations with Chinese companies that are seeking funding.

Very few interviewed companies or CDP respondents reported purchasing renewable electricity. Lenovo mentioned plans to review renewable energy sources, while China Shenhua Energy reported renewable energy generation (excluding biomass sources) of 300,000MWh within the reporting year, 92% of which was sold to the grid and to third parties.

Are there any particular government measures that would influence companies to invest more in renewable energy?

Companies had a number of ideas for additional policies to encourage renewable energy. These included:

- Simplifying renewable energy project approval procedure;
- Stronger monitoring/enforcement of existing regulation;
- Mandatory renewable energy quota for companies, and/or for sub-national government;
- Incentivized tariff for supply of renewable electricity to the grid (or other generation-based subsidy);
- Fiscal/tax support for companies generating renewable energy;
- Trading market for renewable energy, and/or greenhouse gas trading scheme.

India

Country background

Key energy measure

Renewable energy capacity 2009	16.5 GW
Renewable electricity capacity as % of total generation capacity	9%
5-year growth rate in renewable energy	72%
Key renewable energy sectors	Wind, Small Hydro, Biomass
National clean energy investment 2009	US\$ 2.3 billion

Source: Pew Charitable Trusts (2010)

	Includes large-scale energy generators?	Includes intensive energy users?	Includes large-scale energy investors?
Responses to CDP 2009	Yes	Yes	Yes
Interviews 2010	No	Yes	Yes

Data sources used

In 2009 18% of the largest 200 listed companies in India responded to CDP's climate change information request. CDP has sent its Investor information request to Indian companies since 2007. Companies in India are relatively unaccustomed to making voluntary disclosures on these topics, and although response rates are increasing fast they are still low compared to other geographies where CDP operates.

In 2010 interviews were conducted with 6 companies.

1. Wipro (Commercial Services & Supplies)
2. Larsen & Toubro (Construction & Engineering)
3. Ambuja Cements (Construction Materials)
4. Yes Bank (Banks)
5. Company 1 (Metals & Mining)
6. Company 2 (Software & Computer Services)

The total company sample provides a good overview of different types of corporate involvement in clean energy, although no interviews were completed with large-scale power generators.

CDP and its partners had difficulty in persuading Indian companies to be interviewed, and in obtaining permission to attribute views to named companies. Indian companies showed a low level of interest in discussing this topic; we therefore suggest that government should consider motivating companies to share their views and knowledge.

India: policy background

Main Energy Efficiency Policies

Energy Conservation Act (2001)

This act establishes the Bureau of Energy Efficiency (BEE). Measures implemented under the Act include a requirement for large energy-consuming industries to undertake energy audits.

Integrated Energy Policy (2006)

This sets out energy policies and targets for long-term energy security, to sustain social and economic development by 2031/32.

Energy Conservation Building Code (2006)

The code applies to all large new buildings and sets minimum requirements for building envelope components, lighting, HVAC, electrical system, water heating and pumping systems. The code is voluntary but is expected to become mandatory.

Energy Labelling Program for Appliances (2006)

This BEE program covers electrical appliances including refrigerators, fluorescent tube lamps, air conditioners and distribution transformers. It follows a five point rating scale, with one star implying low energy efficiency while a five star rating represents highest energy efficiency.

National Action Plan on Climate Change (2008)

The NAPCC Enhanced Energy Efficiency Mission was recently approved by the Prime Minister's Council on Climate Change. The Mission will enable about Rs. 750 billion worth of transactions in energy efficiency. In doing so, it will, by 2015, help save about 5% of India's annual energy consumption, and nearly 100 million tonnes of carbon dioxide every year.

Enhanced Energy Efficiency Mission targets and measures:

- Mandating specific energy consumption decreases in large energy-consuming industries, including Perform, Achieve & Trade (PAT) energy efficiency trading scheme;
- Implementing energy incentives, including reduced taxes on energy-efficient appliances and the creation of new standards;
- Financing for public-private partnerships to reduce energy consumption through demand-side management programs in the municipal, buildings and agricultural sectors;
- Extending the existing Energy Conservation Building Code;
- Emphasising urban waste management and recycling, including power production from waste.

To further increase energy efficiency, the Indian government plans to retire 7% of the country's inefficient coal plants by 2012, and an additional 10,000 MW by 2017. The government has also said that about 90% of the new capacity that will be added between 2007 and 2031/32 would come from more efficient super-critical, ultra super-critical and IGCC power plants.

Main Renewable Energy Policies

Electricity Act (2003)

This act contains several provisions to promote the accelerated development of power generation from non-conventional sources by encouraging participation through improved grid connectivity and by specifying a percentage of electricity that must be sourced from renewable sources.

National Electricity Policy (2006)

This policy asserts the importance of improving the competitiveness of non-conventional energy resources and reducing capital costs of related projects. Incentives such as preferential tariffs have also been sanctioned under the National Tariff Policy (2006) to progressively improve the share of renewable energy.

National Policy on Bio-fuels (2009)

This policy sets out principles and institutions to govern the production of bio-fuels, including a proposed indicative target of 20% blending of bio-fuels, both for bio-diesel and bio-ethanol, by 2017.

Renewable power generation incentives – national and state-level

Most Indian states have already set their own requirements for renewable energy, ranging from 0.5 to 10% of the total energy portfolio.

- The central government and a number of state governments and union territories have extended fiscal and financial concessions to the wind energy sector for installation of new plant. The central government announced 10-year Generation Based Incentives for Grid Interactive Wind Power Projects in 2008;
- Also, the central government and a number of state governments and union territories have extended fiscal and financial incentives for the development of small hydropower projects. The Hydro Power Policy (2008) proposed an expansion of the existing tariff system to include the private sector;
- The national Solar Generation Based Incentive (2008) provides support to new photovoltaic and thermal solar power plants;
- Concessional customs duties and income tax exemptions also apply to wind energy, biomass power and solar energy. Photovoltaic components are exempted from excise duties.

National Action Plan on Climate Change (2008)

The NAPCC Solar Mission was recently approved by the Prime Minister's Council on Climate Change. Solar Energy Mission targets and measures:

- Installing 20 GW of solar energy in India by 2022. This will be a combination of solar photovoltaic, solar thermal, stand alone PV systems and solar for domestic and industrial applications for water heating;
- Increasing production of solar photovoltaics to 1GW/year in urban areas, industry, and commercial establishments;
- Deploying at least 1GW of solar thermal power generation;
- The establishment of a solar research center, increased international collaboration on technology development, strengthening of domestic manufacturing capacity, and increased government funding and international support for solar energy.

Renewable Energy Certificates (2010)

The Central Electricity Regulatory Commission has introduced regulations so that generators of renewable electricity can sell the environmental attributes of this generation, in the form of Renewable Energy Certificates (RECs) independently from the sale of the electricity.

India: information from companies

Energy Efficiency

How much money do companies invest, or plan to invest, in energy efficiency?

Energy efficiency investments are clearly being made by Indian companies, with energy and cost savings seen as major benefits.

Company	Disclosed spend	Purpose of spend
Larsen & Toubro	INR 2.8 million (US\$ 63,000) at one office location.	Various energy efficiency practices, yielding annual savings of INR 8 million (US \$ 175,000)
Ambuja Cements	INR 105 million (US\$ 2.6 million) in 2009 with INR 90 million planned for 2010.	Figures include both energy efficiency and renewable energy projects.
Company 1	INR 19.5 million to date (US \$ 427,000) with INR 109.4 of further spending planned.	Industrial projects (e.g. in smelters, refineries)

Several companies reported to CDP in 2009 that they see business opportunities to develop product or service lines relating to energy efficiency:

- Wipro sells energy efficient IT equipment (Energy Star ratings 4 and 5) and provides software solutions for the management of energy and emissions, as well as efficient lighting products through Wipro Lighting. The company has also launched a new business division, Wipro EcoEnergy, which offers Systems Integration solutions to support clean energy;
- Larsen & Toubro has been instrumental in the introduction of technological innovations for co-generation and combined cycle power plants, waste heat recovery, coal gasification and sulphur recovery units.

How far in advance do companies plan investments?

Wipro has set a corporate greenhouse gas mitigation plan, which goes to 2015 and includes investment in energy efficiency.

What is the required payback?

Wipro and Company 1 both stated an IRR hurdle rate of 15%, and a payback period of 1-3 years. Company 2 stated a payback requirement of 3-4 years.

What drives companies to invest in energy efficiency?

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security	Other
Wipro	X		X	X		
Larsen & Toubro	X	X	X	X		Ecological responsibility
Ambuja Cements		X	X	X	X	
Yes Bank	X	X	X	X		
Company 1	X			X		
Company 2	X	X		X	X	
Total	5	4	4	6	2	

Has government regulation influenced companies to invest in energy efficiency?

4 interviewed companies said that regulation had influenced their decision to invest in energy efficiency. 1 interviewed company did not answer this question.

1 interviewed company said that regulation had not influenced investments: "The company believes that government regulations have not really played a significant role in determining its investments in energy efficiency." However, the same company also reported that the Clean Development Mechanism (CDM) had significantly influenced these decisions.

Which regulations have been influential, and what effect did they have?

2 companies mentioned the Energy Conservation Act (2001). One of these sees itself as a pioneer in the field of energy. For example, it has been an early adopter of renewable energy use and of the LEED building standard. The Act was mentioned in this context, so it seems likely that it has been used to set a framework for action rather than to drive specific investments. The other company which mentioned the Energy Conservation Act explained that energy audits of company facilities have been useful in helping to identify

opportunities for energy efficiency.

The Energy Conservation and Building Code (2007) was cited by 3 companies. Although the guidelines are voluntary they are seen to reflect both future consumer demand and future regulation, and so they have acted as a spur to action.

2 companies said that investment decisions were influenced by CDM. Ambuja Cements said that this mechanism had influenced management decisions, while the other company said that CDM provides an important income stream.

1 company mentioned the Perform, Achieve and Trade energy efficiency mechanism which was announced by the Indian government in August 2009 under the National Mission on Enhanced Energy Efficiency.

Are there any particular government measures that would influence companies to invest more in energy efficiency?

Policy recommendations made by interviewed companies included the following suggestions:

- Using the National Mission on Energy Efficiency, e.g. Wipro: "We

are happy to note the formation of the National Mission on Energy Efficiency (NMEEE) and expect that it will play a major role in significantly enhancing energy efficiency standards in India on the three major dimensions - Buildings, Factories and Appliances & Equipment."

- Setting mandatory energy efficiency norms and standards for new buildings in addition to the existing voluntary guidelines;
- Using fiscal incentives to bring down the price of energy-efficient products
- Establishing Energy Star-style rating system for capital assets and equipment, with fiscal incentives for use of more efficient plant;
- Extending existing Energy Star program to computing equipment;
- Investing more in technology transfer, e.g. Company 1: "The government should try and purchase technology from across the world and then source it out to Indian companies at cheaper rates";
- Investing in R&D: "Research & development for better technological options ensuring reliability of product".

Renewable Energy

How much money do companies invest, or plan to invest, in renewable energy?

Spend mentioned by companies was quite varied, ranging from internal programs to major developments. Plans for future investments are clearly in evidence.

Company	Disclosed spend	Purpose of spend
Wipro	N/A	“On Renewable energy, our investments till date have primarily been in Solar thermal heating for our guesthouses and in the first demonstration projects in Microwind, Solar PV, LED lighting and Biogas Waste-to-Heat converters. It’s really for the next five years that we have formulated a comprehensive plan of investment in renewable energy, as part of our GHG mitigation plan.”
Larsen & Toubro	INR 520 million (US\$ 11.4 million) order placed	Wind power development. Two additional sites also under consideration.
Company 1	INR 3.8 million (US\$ 83,000) with a further INR 40 million of planned spend	

How far in advance do companies plan investments?	What is the required payback?
This question was not widely answered, although Wipro mentioned a 5-year investment plan.	Company 1 mentioned a 3-year payback requirement, while Company 2 required a period of 3-4 years. Wipro was more circumspect, saying: “We recognize that many of the renewable energy technologies are nascent and emerging and that the cost-return dynamics is likely to change rapidly over the next few years. Our approach to investments in renewable energy is therefore based on cautious optimism. We are ready to look at investment projects that are below the stipulated IRR norm to the extent of 10% variance; we are also ready to evaluate and invest in projects where the returns are strong but deferred.”

A number of the Indian companies which reported to CDP in 2009 mentioned widespread and diverse use of self-generated renewable energy. For example:

- Bharat Petroleum Corporation generates bio-gas from canteen waste, and makes use of wind and solar power. Investments are also being made into research and development for hydrogen fuel cells and bio-diesel;
- Ambuja Cements has been replacing coal with local biofuel in cement kilns.

- Wipro expects its cumulative installed renewable energy capacity (peak) to reach nearly 20MW by 2015.

Purchases of renewable energy were mentioned much less often than onsite generation, but can be important for some companies. In addition to its own renewable generation Wipro expects to achieve 35% of its 2015 reduction target for emissions from electricity through the purchase of renewable electricity.

What drives companies to invest in renewable energy?

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security	Other
Wipro		X		X		
Larsen & Toubro	X	X		X	X	
Ambuja Cements		X	X	X	X	
Yes Bank	X	X	X	X		
Company 1						
Company 2	X	X		X	X	To meet carbon footprint reduction target and for benchmarking best practices with peer industry sector.
Total	3	5	2	5	3	

Has government regulation influenced companies to invest in renewable energy?

Interviews suggested that regulation is a key motivator for investments in this area, but corporate disclosures to CDP in 2009 tell a slightly more complex story. One of the main findings of the Investor CDP 2009 India information request was that few companies noted any current regulatory risks. However, since the formulation of India's National Action Plan on Climate Change, companies realize that the government is serious about climate change. Responding companies therefore anticipate considerable investment to be necessary to remain compliant with potential policy developments.

Where companies did not report significant activity on climate change to CDP in 2009 the most frequently cited reason was India's non Annex-1 status under the Kyoto Protocol. That is, companies do not prioritize renewable energy or energy efficiency initiatives as there are no binding emissions regulations in India. In some responses, companies stated that they do not foresee the possibility of any regulatory caps in the near future.

Which regulations have been influential, and what effect did they have?

Regulations mentioned by interviewed companies included the National Electricity Act (2003), the National Electricity Policy (2005), the National Tariff Policy (2006), the Integrated Energy Policy (2009), the Rural Electrification Policy (2006) and the National Solar Mission. To some extent regulation seems to have played a similar role as in the area of energy efficiency, creating a framework of expectations in which leadership decisions can be made.

Responses to CDP in 2009 indicated that some companies are getting involved in renewable energy investment as a result of financial sector initiatives. The State Bank of India reported: "Environmental Clearance is a precondition for considering sanction of loans by the Bank which is aimed at ensuring that public funds are not used for causing harm to the environment. We also offer concessions in loan finance rates for environmentally friendly projects."

Investment funds for clean energy projects in India can have considerable political support:

- The South Asia Clean Energy Fund (SACEF), a US\$200 million private equity fund co-sponsored by YES BANK, in collaboration with the Global Environment Fund, USA. SACEF will target investments in clean energy, clean technology and energy efficiency across India, Sri Lanka, Nepal and Bangladesh.
- IFCI has established a Green India Venture Fund which makes INR 310 million available for projects in clean technology and renewable energy.

The CDM featured strongly in disclosures to CDP and appeared to be a factor in corporate investments. 10 companies reported involvement in CDM project development, 21 separate energy projects were mentioned which included wind, waste heat recovery and combustion of waste gases. 3 companies provided figures for revenue from the sale of CER credits, totalling millions of US dollars. The Oil & Natural Gas Company reported that since 2005 it has routinely assessed all company activities for CDM project potential. ONGC also plans to supply Voluntary Emissions Reduction credits (VERs) to the carbon market via the Chicago Climate Exchange.

Are there any particular government measures that would influence companies to invest more in renewable energy?

Interviewed companies had a number of recommendations for the Indian government. Specific recommendations included:

- Capital subsidies on clean energy equipment;
- Remove the current limit of 100 KW peak for Solar PV in buildings for capital subsidies for diesel abatement. Subsidies should be on all investments in Solar PV, not only on diesel abatement and there should be no upper limit;
- Feed-in tariff policies must bring the prices of all clean energy on parity with the grid;
- Policy measures should encourage and support the entire cycle of R&D in clean energy;
- The government should aid demand creation by setting standards that will accelerate clean energy adoption e.g. mandatory norms for all new buildings to adopt solar thermal for heating, or for all new coal plants to adopt Clean Coal technology.

South Africa

Country background

Key energy measure

Renewable energy capacity 2009	Existing data not sufficiently robust for comparison with other countries. Target of 1.667 GW installed capacity by 2013
Renewable electricity capacity as % of total generation capacity	
5-year growth rate in renewable energy	
Key renewable energy sectors	
National clean energy investment 2009	\$125 million

Source: Pew Charitable Trusts (2010)

	Includes large-scale energy generators?	Includes intensive energy users?	Includes large-scale energy investors?
Responses to CDP 2009	No	Yes	Yes
Interviews 2010	No	Yes	Yes

Data sources used

In 2009 68% of the largest 100 listed companies in South Africa responded to CDP's climate change information request. CDP has sent its Investor information request to South African companies since 2007.

In 2010 interviews were conducted with 11 companies:

1. Investec (Diversified Financials)
2. Pretoria Portland Cement Co (Capital Goods)
3. Anglo Platinum (Metals & Mining)
4. African Bank (Banks)
5. Medi-Clinic Corp Ltd (Healthcare Equipment & Services)
6. Nedbank (Banks)
7. Woolworths Holdings Ltd (Retailing)
8. Sasol (Energy)
9. AngloGold Ashanti Ltd (Metals & Mining)
10. Massmart (Retailing)
11. Exxaro Resources Ltd (Metals & Mining)

The total company sample provides a good overview of different types of corporate involvement in clean energy, with the exception of large-scale power generation companies.

South Africa: policy background

Main Energy Efficiency Policies

Energy Efficiency Strategy of the Republic of South Africa (2005)

This strategy sets out a path to a final energy demand reduction of 12% by 2015. Implementing instruments created under the strategy address areas including efficiency standards, appliance labelling, certification and accreditation, education information and awareness, research and development, and energy audits.

Energy Efficiency Accord (2005)

In May 2005, following the Government's Energy Efficiency Strategy, a list of commitments was negotiated between both industry and government. Within a framework of eight strategic goals based on the three cornerstones of sustainability, the strategy targets a 15% reduction in final energy demand for the industrial sector by 2015, and a 12% improvement in energy efficiency for the country as a whole by the same date. This target is expressed as a percentage reduction against the projected national energy usage in 2015.

The National Energy Act 2008

This Act facilitates "effective management of energy demand and its conservation". It establishes the South African National Energy Development Institute to increase energy efficiency.

Vision and Strategy for Climate Change (2008)

This provides the overall framework to design the national policy for the transition to a climate-resilient and low carbon economy and society. In March 2009 a Climate Change Summit was held with the intention of translating Cabinet's climate change decisions and directives into action. Expected national regulatory and policy interventions in the area of energy efficiency include:

- ambitious mandatory targets for energy efficiency;
- introducing industrial policy that favours sectors using less energy per unit of economic output as well as energy efficiency standards for industrial equipment and processes.

Taxation Laws Amendment Act (2009)

This Act enables the creation of a tax incentive granted in return for corporate energy efficiency savings.

Power Conservation Programme (PCP) (2010?)

This program aims to enable South Africa to use electricity much more efficiently and sustainably; and was proposed after unexpected electricity load-shedding due to a surge in demand. The key components of PCP include the Energy Conservation Scheme (ECS) to reduce energy consumption by 10%, and electricity growth management to manage new electrical connections and consumption growth in line with available supply capacity.

An interim ECS was implemented on 1 July 2008, with the aim of converting into a formal scheme once the regulatory enablers are in place. Should customers exceed their monthly energy allocation, excess charges will be levied. However, the newly elected government has not as yet given the go ahead for the roll-out of the formal scheme.

Energy Efficiency tax measures (proposed)

The Department of Treasury has released new tax proposals on energy efficiency for public comment. These focus on investments in new qualifying energy-efficient equipment, which would qualify for an additional "top-up" of up to 15% of the purchase price. Companies that achieved energy efficiency savings through improved production processes on baseline energy efficiency model would qualify for an additional tax deduction of up to 50% of the monetary value of the energy efficiency savings.

Main Renewable Energy Policies

White Paper on Renewable Energy (2003)

This paper promoted the use of financial and fiscal instruments to incentivise the development of renewable energy capacity, including regulations for pricing and the integration of Independent Power Producers into the electricity system. It also proposed technology support centres, such as the South African National Energy Research Institute.

Renewable Energy Framework

This Framework promotes new renewable energy generation projects in order to meet South Africa's 2013 Renewable Energy target. 60% of the Renewable Energy target of 10,000 GWh is to be met by electricity generation and 40% through the generation of other types of energy including sugar-cane bagasse, landfill gas extraction, mini-hydroelectric schemes, and commercial and domestic solar water heaters.

Biofuels Industrial Strategy (December 2007)

This is a refinement of the draft Strategy approved by Cabinet for public comments in December 2006. A significant change to the draft Strategy is to adopt a short term focus (5 year pilot) to achieve a 2% penetration level of biofuels in the national liquid fuel supply, or 400 million litres pa. The target has been revised down from the 4.5% target that was initially proposed in the draft Strategy document.

Solar Water Heating Programme (2008)

In early 2008, the state-owned energy utility Eskom launched a programme to support the large-scale introduction of solar water heating. The programme is funded by a tariff levied on consumer electricity bills. Solar water heater purchasers receive a direct rebate, after submitting a claim for the rebate to Eskom's auditors.

Renewable Energy Feed-in Tariff (2009)

On 26 March 2009 South Africa's National Energy Regulator (NERSA) approved the country's first renewable energy feed-in tariff (REFIT) scheme. The REFIT places an obligation on Eskom (South Africa's public utility) to purchase the output from qualifying renewable energy generators at pre-determined prices based on the levelized cost of electricity. The cost of the tariff will be passed through to Eskom electricity customers. Initially NERSA approved REFITs Phase I which covered the following four technologies: wind; small hydro; landfill gas methane and concentrated solar plant (CSP) parabolic trough with storage (6 hrs per day). On 2 November 2009, REFITs Phase II tariffs were approved for six new technologies: CSP trough without storage, CSP Tower with storage of 6 hrs per day, large-scale (1MW or more) grid connected PV systems, solid biomass, and biogas.

Vision and Strategy for Climate Change (2008)

Expected national regulatory and policy interventions in the area of renewable energy include:

- long-term goal of achieving a net zero-carbon electricity sector;
- targets for electricity generated from both renewable and nuclear energy sources;
- renewable energy feed-in tariff set at a level adequate to incentivize large-scale investment.

Integrated Resource Plan (IRP) (proposed)

This draft national policy document will formulate an integrated approach to managing energy in South Africa. The IRP gives effect to the following policy objectives:

- 10 000Gwh (approximately 4% of the energy mix) of renewable energy usage;
- The implementation of Energy Efficiency and Demand Side Management through financial incentives scheme;
- Installation of one million solar water heaters.

South Africa: information from companies

Energy Efficiency

How much money do companies invest, or plan to invest, in energy efficiency?

Company	Disclosed spend	Purpose of spend
Investec	ZAR 4.6 million (US\$ 622,000) with a further 6 million planned	Energy-efficient lighting in buildings
African Bank	ZAR 200,000 (US\$ 27,000)	Energy saving lighting and geyser blankets at head office
Nedbank	ZAR 3 million planned (US\$ 400,000)	Not stated
Woolworths	ZAR 10 million to date (US\$ 1.4 million), 20 million planned	Air conditioning, refrigeration, lighting
Sasol	ZAR 100 million (US\$ 13.45 million), ZAR 4.8 billion planned	Efficient plant
AngloGold Ashanti	ZAR 124 million (US\$ 16.8 million)	Various, e.g. replacement of air compressors

Of the companies that reported to CDP in 2009, 35% reported having an energy-related corporate target. Energy efficiency activities being undertaken to meet these targets included:

- Managing operating time for computers and IT equipment, lifts and escalators;
- Efficient management of air conditioners, lighting, geysers and extraction fans.

Energy efficiency is often considered in capital expenditure decision-making but in many cases it is not the primary objective or driver behind the investment. For example, when interviewed Anglo Platinum said, "Some investments are driven by other motivators such as improved extraction. However, often new investments are more energy efficient. Of the R 141 500 000 (spent in 2008), roughly R 80 - R 90 million was spent on energy efficiency directly."

How far in advance do companies plan investments?	What is the required payback?
In most cases timeframes for planning energy efficiency investments were between one and ten years.	Required payback periods varied significantly. Most companies indicated that there was no specific payback period required. Some specific statements indicated that the decision-making process can be complex: <ul style="list-style-type: none"> • Sasol: "Investments must meet the hurdle rate for all projects: 1.3 times the cost of capital (Weighted Average Cost of Capital)." • AngloGold Ashanti: "The company will tolerate longer payback periods if the money comes from a fund such as CDM." • Pretoria Portland Cement: "Investment decisions are based on a number of factors. Non financial justifications are given rough financial value or a risk premium when calculating payback periods."

What drives companies to invest in energy efficiency?

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. CDM	Internal policy (CSR, Environment)	Energy security	Other
Investec	X	X		X	X	
Pretoria Portland Cement Co	X	X	X	X	X	
Anglo Platinum	X	X		X	X	
African Bank	X			X	X	
Medi-Clinic Corp Ltd	X		X	X	X	
Nedbank	X	X	X	X		
Woolworths Holdings Ltd	X	X	X	X	X	Stakeholder pressure (mostly from investors)
Sasol	X	X	X	X	X	Reducing greenhouse gas emissions
AngloGold Ashanti Ltd	X		X	X	X	
Massmart	X			X		
Exxaro Resources Ltd	X	X	X	X	X	
Total	11	7	7	11	9	

Has government regulation influenced companies to invest in energy efficiency?

Government regulation does not appear to have had a significant influence on the sample companies' decision-making with regard to investing in energy efficiency, with one of the interviewees (Nedbank) suggesting that: "None of the current policy documents have any teeth." A number of companies said that any regulatory or policy requirements have been met through what the company was already doing in terms of energy efficiency

Which regulations have been influential, and what effect did they have?

The Energy Efficiency Accord (EEA) was most frequently mentioned by interviewed companies although its effect may not always be very strong, e.g. AngloGold Ashanti said: "The Energy Efficiency Accord happened to be aligned with what AngloGold Ashanti was already doing. It re-enforced our decision to invest in energy efficiency but did not directly influence us." 35% of companies that reported to CDP in 2009 were signatories to the Energy Efficiency Accord. Most of the reported energy targets were based on the commitment to reduce energy intensity by 15% by 2015 (on a 2000 baseline) that forms part of the EEA, suggesting that the EEA does at minimum create a framework for action.

Of future regulations, interviewed companies most frequently mentioned the proposed Power Conservation Program, followed by the new energy efficiency tax incentive, and any future carbon tax. One company indicated that "anticipated requirements of the climate change agenda" would likely influence future investment.

CDM is clearly a driver of corporate investment; 33% of South African companies that reported to CDP in 2009 had an involvement in CDM projects covering both energy efficiency and renewable energy activities.

Are there any particular government measures that would influence companies to invest more in energy efficiency?

Several companies talked about the need to implement the proposed Energy Efficiency Tax Incentive as soon as possible. Medi-Clinic suggested that this tax benefit should be expanded to include the service sector.

Several companies mentioned mandatory energy efficiency targets, but without a consensus view on whether this measure would be welcome. African Bank favoured the introduction of industry targets differentiated by sector, while AngloGold Ashanti favoured incentives as an alternative. Woolworths also suggested a "favourable tariff for good performance".

Massmart mentioned product energy standards, suggesting: "Finalisation by the Department of Trade and Industry of the South African equivalent of the Energy Star rating for consumer goods. Massmart Holdings can put pressure on suppliers but it will remain difficult until there is an acceptable standard."

Renewable Energy

How much money do companies invest, or plan to invest, in renewable energy?

Several companies mentioned quite sizeable spend on renewable energy. However the picture was mixed, as several others reported no significant investments in this area.

Company	Disclosed spend	Purpose of spend
Sasol	ZAR 40 million (\$US 5.4 million)	Investment in solar thin film manufacturing company
AngloGold Ashanti	ZAR 7 million (\$US 947,000)	Heat pumps and hydroelectric generation
Exxaro	ZAR 8 million (\$US 1 million) with more planned	Solar thermal and wind energy generation

How far in advance do companies plan investments?	What is the required payback?
In most cases timeframes for planning renewable energy investments varied between one and five years.	Most companies indicated that there was no specific payback period required. Financial companies indicated that Return on Capital (ROC) was important in considering projects. Investec said that a ROC of roughly 20% was desirable.

What drives companies to invest in renewable energy?

	Reduction in energy costs	Current or likely future regulation	Income/incentive, e.g. GDM	Internal policy (CSR, Environment)	Energy security	Other
Investec		X	X	X	X	Being a first mover, creating value for shareholders
Pretoria Portland Cement Co	X	X	X	X	X	
Anglo Platinum	X	X		X	X	
African Bank	X			X	X	
Medi-Clinic Corp Ltd	X	X	X	X	X	
Nedbank	X		X	X		
Woolworths Holdings Ltd	X	X		X		
Sasol		X	X	X	X	Reducing greenhouse gas emissions. Reducing energy costs will be a factor in the longer term.
AngloGold Ashanti Ltd	X		X	X	X	
Massmart			X	X	X	
Exxaro Resources Ltd		X	X	X	X	
Total	7	7	8	11	9	

Has government regulation influenced companies to invest in renewable energy?

Almost all companies said that government regulation had not had a significant influence on investments in renewable energy. For example, Massmart said: “Regulations have not affected costs in a way that has created a business case for investing in, or purchasing renewable energy for the company.”

However there is an expectation of future regulation. Anglo Platinum said: “Government regulation has not influenced the company but there will be more regulation relating to renewable energy in the future. Currently there is uncertainty as to how policy will unfold but we anticipate that future regulation will have more of an influence on the company.”

Companies require clear policy signals regarding renewable energy. Investec said, “The conundrum is that investors feel that this will be resolved over time and that investing in renewable energy is therefore a good decision. However organizations want to act early (first mover advantage) but getting the timing right is difficult.” Sasol said, “We need to understand, as soon as possible, the government’s greenhouse gas policy. Investments are long term; we don’t want to make an investment now and then the next day be called a polluter.”

Which regulations have been influential, and what effect did they have?

CDM was the most common measure that had influenced investment Investec said, “If a project becomes a CDM project then the returns will be even higher. All projects are implemented through a process to ensure that they could be eligible to qualify for CDM at a later stage.”

Companies appeared to be taking note of possible future regulation. Investec said, “Possible mandatory targets for renewable energy [as set out in the White Paper on Renewable Energy, 2003 - currently not mandatory] are driving interest in investing in renewable energy generation.”

Are there any particular government measures that would influence companies to invest more in renewable energy?

Increasing certainty around the rules for the Renewable Energy Feed-in Tariff (REFIT) was the most common suggestion, made by 7 companies. 4 companies suggested implementing targets for renewable energy.

Support for research and development was discussed by a few companies. Sasol suggested “Specific tax incentives for R&D work in this field”. Pretoria Portland Cement said, “The PFMA (Public Finance Management Act 1 of 1999) and the MFMA (Municipal Finance Management Act 56 of 2003) require that all government purchases go out to tender. This makes it difficult for novel technologies to be developed further. The tender process is onerous and the company does not want to make its technologies public.”

Technology-specific approaches were unpopular with some companies. Pretoria Portland Cement said, “Approaches need to be realistic: the solar water heater approach was not realistic”, while AngloGold Ashanti said, “Be less prescriptive on technology options especially with regards to solar technology. Allow the market to make the best choices”, and “Make subsidies for processes rather than technologies.” Medi-Clinic suggested more support for corporate implementation of CDM.

Bank guarantees were suggested by Nedbank: “There is a need for guarantees in order for banks to provide funding. The lack of guarantees limits the amount of funding that the banks can provide for energy efficient investments by households as well as Demand Side Management projects such as solar water heaters.” Massmart also addressed household energy use, saying: “Allow consumers to recover any renewable energy incentives directly from the retailer. If Massmart knew that they could recover the incentive then the company could sell at the reduced price and stimulate demand.”

Conclusion

The analysis in this report demonstrates that companies in BASIC countries are making significant investments in renewable energy and energy efficiency. In addition, the results confirm that national and international policy measures act as an important driver for these investments. Policy measures, including the CDM, clearly influence investments. Additional drivers often relate to specific national circumstances, for example it is clear that energy supply challenges in South Africa have been key to setting corporate priorities, as well as setting the context for new and emerging regulation.

Comparative levels of investment reflect wider economic conditions in each country. In particular, energy investments reported by companies in China, now one of the world's largest economies as well as one of its largest markets, are much larger than those seen in the other three countries. South Africa has the smallest overall economy and also the lowest level of reported corporate investment.

Some broad findings apply to each of the four countries and are discussed at greater length on the 'Overall Findings' section near the start of this report.

1. Companies in BASIC countries are making very sizeable investments in clean energy.
2. High-level policy signals are necessary and useful.
3. In addition to high-level signals, clear and specific regulation is also needed.
4. CDM has made a contribution, and consideration should be given to its future role.

As these points suggest, government policy and regulation are found to be important motivators for corporate investment. Both high-level signals and specific, targeted regulations have an effect on investment.

As well as creating requirements for corporate action, government measures also have the effect of creating a framework of expectations. Across all four countries, companies consistently stated that they were guided by internal company policy when making investment decisions. This policy is not developed in isolation but is created in response to public, market and regulatory developments including assessment of the likelihood of future regulation.

Specific policy recommendations by companies are often led by sectoral or national considerations, but certain overarching themes emerge. Companies are particularly motivated by incentives (including the CDM), and by measures such as league tables or targets which are directly linked to individual corporate performance. Recent work on renewable energy investment by Chatham House has identified a set of characteristics for "Investment Grade Policy" that is "long, loud and legal". In the future we see many opportunities for regulators to learn from one another about what measures are, or are not, effective in influencing clean energy investment by companies. We hope that this report will provide a modest contribution to that process.

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