Global Corporate Renewable Energy Index (CREX) 2012

Bloomberg NEW ENERGY FINANCE

Vestas®

Preface

Vestas Wind Systems A/S and Bloomberg New Energy Finance are proud to announce the latest results from the Corporate Renewable Energy Index or "CREX".

Worldwide, investments in clean energy solutions continue to rise, having increased from $54bn in 2004 to $280bn in 2011. Within power generation, renewable technologies accounted for nearly half of all investments in 2011 - $237bn compared to $302bn for fossil fuel based power generation[1]. When excluding replacement plants, fossil based power generation investments are reduced to $223bn, some $14bn lower than the corresponding renewables figure.

Much of the demand for renewable technologies has been driven by specific energy policies. But there is also a growing awareness of the benefits of generating and using clean energy over and above the incentives provided by governments, especially among corporate energy users.

The aim of the CREX is to identify the quantity and the sources of renewable energy used by companies around the world, based on a detailed survey. This provides much-needed transparency for a range of stakeholders, including:

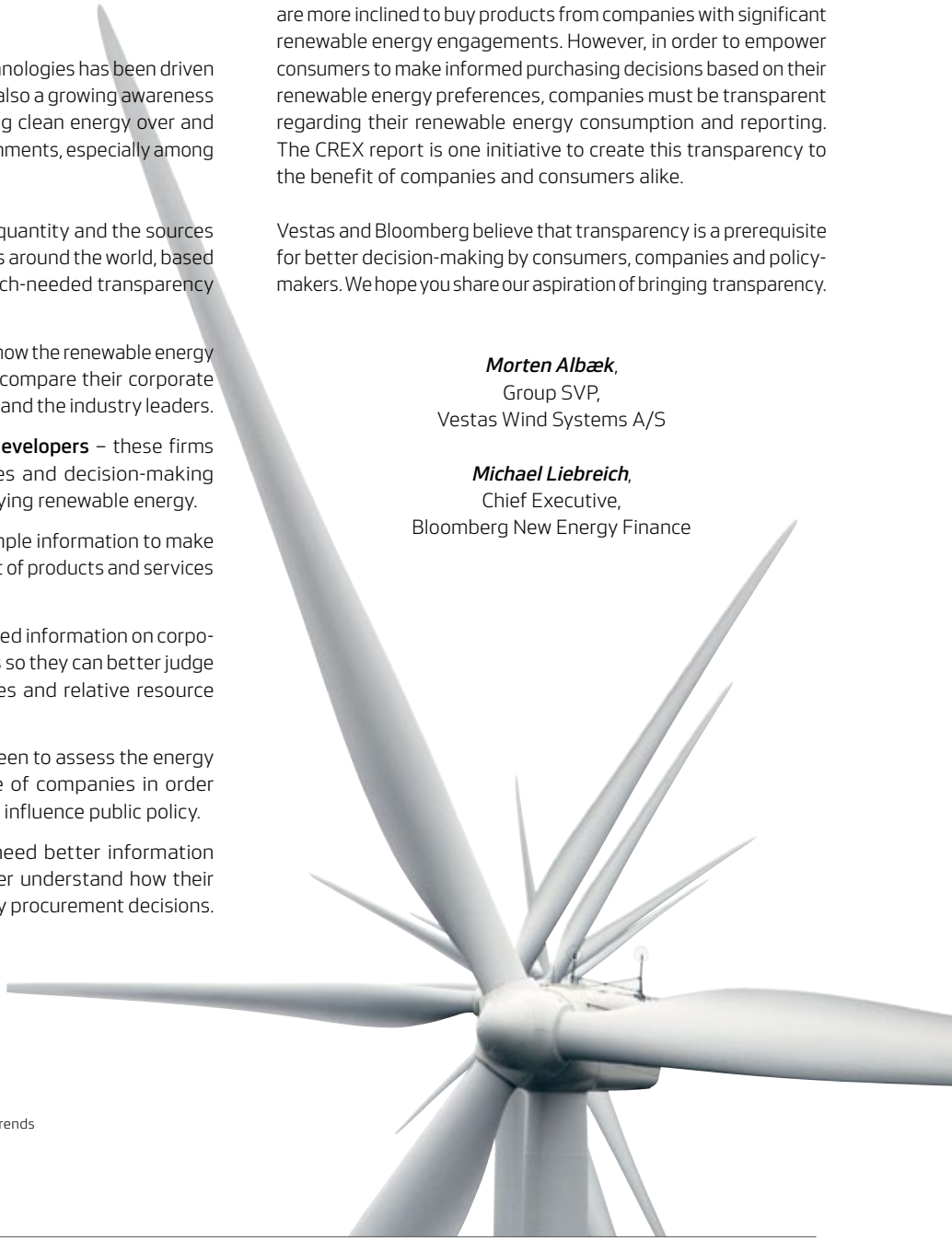
- **Companies** – companies need to know the renewable energy options available to them and to compare their corporate performance to that of their peers and the industry leaders.
- **Utilities and renewable energy developers** – these firms need to understand the priorities and decision-making processes of companies when buying renewable energy.
- **Consumers** – consumers want simple information to make decisions about the energy content of products and services they buy.
- **Investors** – investors need improved information on corporate energy consumption patterns so they can better judge risk in companies' energy supplies and relative resource efficiency.
- **NGOs** – these organisations are keen to assess the energy and environmental performance of companies in order successfully to effect change and influence public policy.
- **Policy-makers** – public bodies need better information on corporate energy use to better understand how their decisions impact corporate energy procurement decisions.

Simultaneously with the release of this report, the complementary Global Consumer Wind Study (GCWS) is published by TNS Gallup and Vestas Wind Systems. The GCWS is a global survey conducted among 24,000 consumers representing 20 countries. It provides data on consumer attitudes towards renewable energy, and on how corporate renewable energy adoption influences consumers' perception of brands. According to the study, informed consumers are more inclined to buy products from companies with significant renewable energy engagements. However, in order to empower consumers to make informed purchasing decisions based on their renewable energy preferences, companies must be transparent regarding their renewable energy consumption and reporting. The CREX report is one initiative to create this transparency to the benefit of companies and consumers alike.

Vestas and Bloomberg believe that transparency is a prerequisite for better decision-making by consumers, companies and policy-makers. We hope you share our aspiration of bringing transparency.

Morten Albæk,
Group SVP,
Vestas Wind Systems A/S

Michael Liebreich,
Chief Executive,
Bloomberg New Energy Finance



1. Bloomberg New Energy Finance/UNEP, Global Trends in Renewable Energy Investment, 2012

Table of **Contents**

Table of Figures

Table of Tables

Executive **Summary**

Companies are increasingly becoming important drivers of demand for renewable energy worldwide. In addition to government-mandated renewable energy purchases, which are usually well-tracked for legal compliance reasons, the voluntary demand for renewable energy results in significant investments in green energy worldwide. Now in its third year, the Corporate Renewable Energy Index (CREX) brings transparency to these voluntary markets.

Global investment in new renewable capacity has continued to rise. In 2011 net investment in renewable power capacity outpaced that of fossil fuel generation ($237bn for renewables versus $223bn for additional fossil fuel generation)[2].

For the CREX, Bloomberg New Energy Finance collects information on the amount and type of renewable energy used by the world's largest organisations for their own use, and also includes some innovative smaller companies. The CREX ranking is based on the amount of renewable energy procured by the respondents in 2011 (in MWh) as a percentage of their total electricity procurement in the same period. The 2011 results contain over 300 companies from an initial contact list of nearly 1800. Whereas in previous years the CREX was heavily weighted towards developed countries and particularly the US, this year there was a more global distribution of participants. This global CREX report is being released at the same time as six regional focus papers on the US, Brazil, India, Australia, the UK and Germany.

The CREX companies tend to fall into two extremes, with most meeting only a small proportion of their power needs from renewable energy but some relying on renewable energy 100%.

As noted in previous CREX reports, the majority of companies use only a small amount of renewable energy (almost 30% of companies use less than 5% renewables). However the 2011 results show that at the other extreme, 35 companies source all their electricity from renewable sources and take equal first place in our rankings. These companies tend to be in consumer-facing sectors such as Financials, Consumer Services and Consumer Goods, purchasing Renewable Energy Certificates (RECs) to cover all their power usage, thereby providing a strong positive marketing message. The absolute MWh procurement level is generally a function of the size of the company. However there are other 'non-discretionary' factors which can prompt companies to use a greater amount of renewable energy such as the requirement of aluminium smelters to have a plentiful, reliable and cheap supply of electricity, which may favour siting near hydroelectric dams, and the ability of sugar and pulp and paper producers to generate energy by burning their biomass waste.

Companies obtain their renewable electricity a number of different ways, with direct investment being the most popular at 40% of renewable electricity purchases in 2011, closely followed by RECs at 38%.

However, companies often find the market confusing and lacking in transparency. The 2011 CREX includes more Brazilian and Indian companies than in previous years, so that, while in Europe and North America buying RECs or similar guarantees of origin continues to be the most popular way of procuring renewable energy, the global balance is tipped towards onsite investment and power purchase agreements.

European companies tend to favour renewable energy procurement more than companies in the US.

The European CREX respondents purchased a large amount of their renewable energy via RECs or green pricing programmes, which are available throughout most of Europe, where consumers typically have high expectations of companies' sustainability and renewable energy practices. In the US, however, the compliance REC markets only operate in 32 states and the District of Columbia. RECs can be purchased voluntarily anywhere in the US, but the lack of policy targets in certain states indicates the patchiness of political support and consumer sentiment across the country.

2. Bloomberg New Energy Finance/UNEP, Global Trends in Renewable Energy Investment, 2012

Many companies are making a significant commitment to renewable energy through direct investment in on-site generation (40% of renewable electricity purchases in 2011).

For companies with a large electricity demand, such as those in the Industrials, Consumer Goods and Basic Materials sectors, security of power supply is critical. Direct investments are particularly popular in countries where the grid supply is at times restricted (e.g. India) or where local renewable energy sources such as biomass and hydro power are readily available (e.g. Brazil). In addition, revenue can be generated by selling surplus power and the associated RECs if available.

Hydroelectric power is the most popular form of renewable energy (47% of the total share when the technology source is known), followed by wind (with 29%), and biomass and waste-to-energy (with a combined 23%).

These results are significantly influenced by the big electricity users in Brazil that use high levels of biomass and hydro power. Wind is favoured by companies looking for a cost-effective addition to a renewable energy portfolio where hydro power may not be available or where the company is concerned about additionality. In addition, wind turbines are a particularly visible sign to customers of a company's commitment to renewable energy. Solar is a small proportion (<1%) of total renewable energy generation because costs have been relatively high until recently, power output is dependent on geography and weather, and the technology is less easily scaled up to large capacities than some other technologies. However, with the recent plummeting of Photovoltaics cells (PV) prices, we can expect solar energy's share to grow in future.

The decision to procure renewable energy is generally taken at board-level, as part of the company's corporate sustainability efforts.

This was highlighted by the responses to the more qualitative questions that were added to this year's CREX survey. Companies use renewable energy to enhance the "greenness" of their brand with customers, helping them to differentiate from their competitors and drive sales. The survey responses also showed that a focus on renewable energy and sustainability is important in maintaining support from shareholders and improving employee retention and motivation.

The voluntary procurement of renewable energy has grown in recent years, and this is set to continue, but the pace of growth will depend on political and regulatory support.

The three years of CREX data shows that global renewable energy as a percentage of the total electricity procurement increased from 14% in 2009 to 16% in 2011. In addition, over half of this year's respondents state that they will procure more renewable energy in future. Companies are increasingly shifting the focus of their sustainability strategy from energy efficiency to renewable energy. However, there are CREX companies in all the key countries calling for an expansion in regulatory support for renewable energy, through mechanisms such as liberalising power markets, supporting incentive schemes or taxes on carbon dioxide emissions. Therefore governments and policy makers have an important role to play in the growth of this market.

1. Introduction

1.1. CREX objectives

Government programmes to mandate renewable energy use, such as the Renewable Portfolio Standards in use in many US states, require power companies to supply a certain percent of their electricity from renewable generators by a specified year. Similarly, special tariffs for renewable electricity have incentivised the development of new renewable capacity around the world.

However the voluntary use of renewable energy by companies is less well understood. In this case, companies choose to use renewable energy rather than conventional power, or purchase some sort of renewable energy credits. They may do this for branding and reputational benefits, to hedge against rising electricity prices or to ensure a reliable source of power supply. With governments in several major markets preparing to reduce subsidies for renewables, the voluntary procurement of renewable energy will become increasingly important.

The purpose of the global Corporate Renewable Energy Index (CREX) is to provide transparency on corporate energy consumption, shedding light on the amount and type of renewable energy used by the world's largest firms, plus some innovative smaller companies. We also look at companies' reasons for purchasing renewable energy and drill into the popularity of the various procurement methods available. Consumer demand is a powerful transformational force, and the information contained in CREX allows consumers to make more informed decisions when purchasing products and services. This in turn may prompt more companies to switch to renewable sources of energy and be listed in CREX in the future.

This report includes results from all three years of the CREX Survey (2009, 2010 and 2011) during which time a total of 393 companies contributed data. The most recent responses were collected in July 2012 for the 2011 reporting period. The ranking of the respondents is based on the amount of renewable electricity procured for their own use in 2011 as a percentage of their total electricity consumption.

We are pleased to report that the total number of participants has increased significantly from 176 in 2010, to 306 in 2011. In addition, over half of this year's respondents state that they will procure more renewable energy in future.

1.2. Data collection

The CREX represents the most comprehensive snapshot to date of corporate voluntary renewable energy procurement. However it only includes companies that responded to Bloomberg New Energy Finance's survey, or to whose data we have access. Principal data sources other than the survey included companies' own corporate social responsibility (CSR) reports, the US Environmental Protection Agency (EPA) Green Power Partnership and the Carbon Disclosure Project[3] which aggregates data reported voluntarily. All of our data sources are 'opt-in' to some extent, so this survey cannot be considered a comprehensive view of all renewable energy purchases globally.

Companies that chose not to participate in the survey frequently gave the following reasons:

- They focus on energy efficiency rather than renewable energy procurement to meet greenhouse gas reduction targets.
- There is a lack of a reporting infrastructure, either because energy usage data is not routinely collected or because autonomous business units do not report the data to a central body.
- They are concerned that a low level of renewable energy procurement will result in a low CREX ranking.

Companies interested in being included in future editions of the CREX should contact Bloomberg New Energy Finance directly on +44 20 3216 4700 or email sales.bnef@bloomberg.net

3. Carbon Disclosure Project: www.cdproject.net

1.3. Focus countries

This year builds on two previous years of CREX studies. We allocated more resources to collecting data from a wider range of locations, with a focus on six countries: Germany, the UK, Brazil, India, Australia and the US. Companies from these six countries accounted for approximately two thirds of CREX responses in 2011.

Note that company locations are based on the location of the headquarters rather than where their operations are sited. For example, Deutsche Bank is defined as a German company, although it has operations and offices in over 70 countries.

1.4. Sector definitions

The company classification in this report broadly follows the Industry Classification Benchmark (ICB) system. We only refer to the top level sector of each company ("Industry" level in the ICB hierarchy). For the purposes of this report, business support services companies (eg. management consultancies and accounting firms) have been reclassified from 'Industrials' to 'Financials', in line with these companies' energy intensities.

Table 1: Sector classification in this report

Sector	Description	Example companies
Energy	Oil and gas exploration and extraction, renewable and alternative energy	Anadarko Petroleum, AMEC, Centrotec, Vestas
Basic Materials	Chemicals, paper, forestry, metals, mining,	Anglo American, Alcoa, OneSteel
Industrials	Construction, aerospace, engineering, transportation, waste disposal	Fedex, Cobham, Lockheed Martin
Consumer Goods	Manufacture of automobiles, food and beverages, personal and household goods	The Coca Cola Company, BMW, Asics, Associated British Foods
Health Care	Health care equipment and services, biotechnology and pharmaceuticals	GlaxoSmithKline, UCB, BioGen
Consumer Services	Retail, media, travel & leisure	Boots, Bloomberg, Vivendi, Grupo Pão de Açúcar
Telecommunications	Fixed line and mobile telecommunications	Deutsche Telekom, BT, NTT
Utilities	Generation and supply of electricity, gas, water and multi-utilities	Severn Trent, Consolidated Edison, SNAM
Financials	Banking, insurance, real estate, financial services, business support services*	RBS, HSBC, Citigroup, Ernst & Young*
Technology	Software and computer services, hardware and equipment	Motorola Solutions, Invensys, Dell, Infosys, Wipro

Source: Bloomberg New Energy Finance

*All "business services" companies were moved from "Industrials" to "Financials" for the purposes of 2011 CREX analysis

2. Renewable Energy **Overview**

2.1. Investments in renewable energy have seen strong growth, helped by policy incentives

Responding to pressure from citizens, scientists and the business community, many governments have passed legislation to promote investment in renewable energy in their power sectors. To varying degrees, this legislation uses policy tools such as feed-in tariffs (FiTs), tax credits, mandated targets and REC schemes to accelerate the deployment of renewables and reduce the dependence of the power sector on fossil fuels. In 2008-09, governments around the world committed to more than $190bn of 'green stimulus', enabling renewable energy investment to grow even through the most severe recession in decades[4].

Furthermore, the costs of renewable energy generation have decreased substantially, partly due to technological improvements and partly due to cheaper components entering the market from China. In particular the cost of PV energy fell by about 70% and onshore wind turbines by 25% between Q3 2008 and Q3 2012[5]. In August 2012, Bloomberg New Energy Finance's Levelised Cost of Energy model estimated the cost of onshore wind power at $85/MWh, close to that of coal-fired power ($82/MWh) and natural gas-fired generation ($71/MWh)[5]. However, much of the renewables industry still depends on government subsidies to be competitive, particularly as the fossil fuel power market is itself still heavily subsidised.

Clean energy investments have risen strongly over the past decade, suffering only a pause in 2009, in the face of the worst recession in more than half a century. Figure 1 shows global investment in clean energy over the past eight years as tracked by Bloomberg New Energy Finance[6]. These figures incorporate investments in all clean energy sources including energy efficiency and smart grids, but renewable energy is by far the largest sub-set. Note, however, that only a small share of this investment relates to the voluntary corporate procurement surveyed in this report.

Between 2004 and mid-2008, the clean energy industry experienced a period of growth fuelled by government policies, high natural gas prices and an abundance of low-cost capital. However the financial crisis from 2008 caused the financing of large-scale projects to slow amid tightening credit, high costs of capital and a drop in power prices caused by low natural gas prices. Fortunately for the renewables sector, governments and development banks stepped in at this point to finance projects large and small.

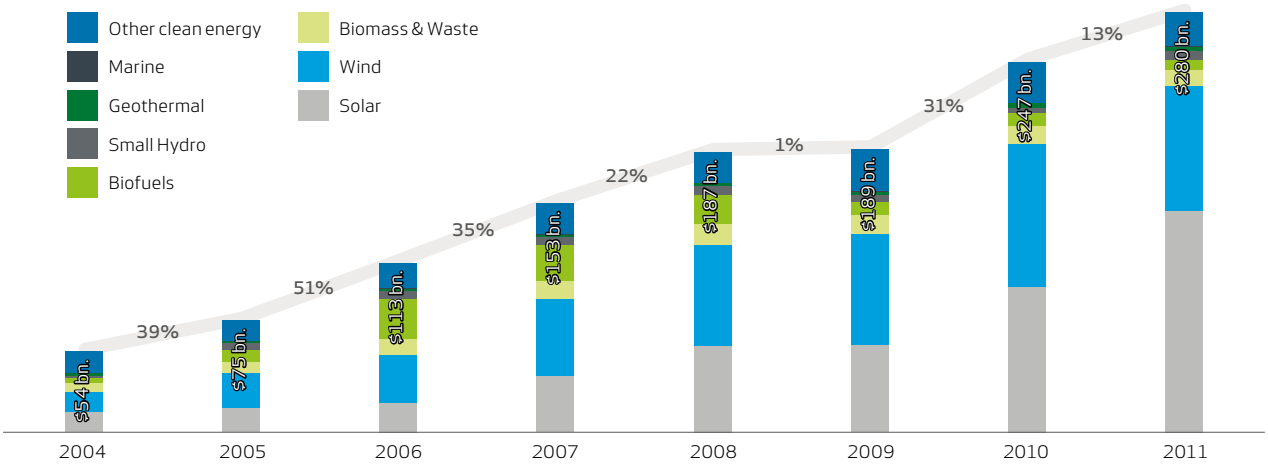
Historically, the bulk of investment has been in large-scale clean power generating projects, particularly wind, due to its technological maturity and relative economic competitiveness. In the past few years however, small-scale distributed generation projects have started to play a major role, accounting for about half of the growth in total investment since 2009.

4. Bloomberg New Energy Finance, Global Trends in Renewable Energy Investment, 2012. Note that 'other clean energy' includes those technologies defined by BNEF as Energy Smart Technologies (EST) such as smart grids, energy storage, energy efficiency and electric vehicles.

5. Bloomberg New Energy Finance Quarterly Outlook: "Q3 2012 Levelised Cost of Energy Update", 18 July 2012

6. The investment figures originate from the Bloomberg New Energy Finance Desktop, which covers over 32,500 organisations (including start-ups, corporates, venture capital and private equity providers, banks and other investors), 21,500 projects and 17,000 transactions.

Figure 1: Global total new investment in clean energy, 2004–11 ($bn)



Source: Bloomberg New Energy Finance.

Note: Includes corporate and government R&D, small distributed capacity, and estimates for undisclosed deals. Adjusted for re-invested equity. Does not include proceeds from acquisition transactions. Excludes large hydro-electric projects of more than 50MW.

2.2. Companies are also expanding their consumption of renewable energy voluntarily

In parallel to the growth in renewable energy investment, the voluntary use of renewable energy by companies has also been growing. This is where companies choose to use renewable energy to replace some or all of their conventional power needs, or to purchase some sort of renewable energy credits, generally for the marketing benefits. Renewable energy typically forms part of the company's corporate sustainability efforts, to green their electricity supply and reduce carbon emissions. In some situations renewable energy is also used to ensure a reliable power supply for facilities or a facility that generates organic waste may use that material as an energy resource to avoid disposal costs and offset offsite power costs. Section 4.2 explains the rationale for this choice in more detail.

Companies have a range of options available to them for using renewable energy (Figure 2). Each has distinct characteristics, with the availability and price of each option varying considerably between countries.

Renewable energy certificate (REC) procurement: these tradable credits (such as green certificates in Europe and Renewables Obligation Certificates in the UK) are sold separately from the power produced. Companies procuring credits from the voluntary market can then claim, after certificates have been retired (used up), that they have purchased a quantity of renewable energy corresponding to the number of RECs. Traders may manage and retire the RECs on the company's behalf, or the company may do this in-house. The US and Europe both have fairly developed markets for RECs or similar guarantee of origin certificates. In these regions, various certificates and markets exist to serve compliance and voluntary demand separately. In Brazil and India, however, the compliance and voluntary certificates are one and the same. Certificates are not generally transferrable between markets.

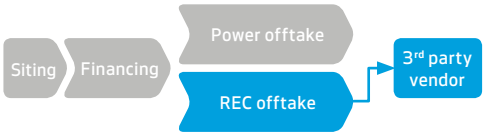
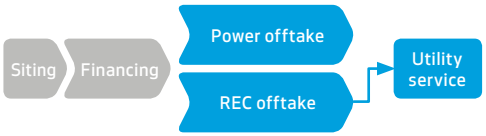
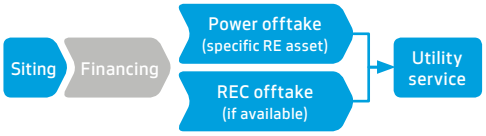
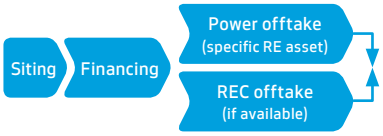
Green power procurement: a power supplier offers the purchasing company a guarantee that its power has been produced using a certain minimum percentage of renewable energy. This guarantee can take many forms depending on the jurisdiction and on the supplier. Sometimes the supplier's own assets may be feeding power into the grid; sometimes the supplier may be simply buying certificates as outlined in (1). In either case, the recipient of the electricity can claim that they are purchasing renewable energy while the burden of assuring its origin is on the supplier.

Power purchase agreement (PPA): the company receives renewable energy (and the associated RECs if produced) from a specific project. These are long-term bilateral agreements, which contain clear commercial terms for the transfer of electricity and the associated RECs between the two parties. The assets are either located at the site of the company (eg, photovoltaic systems on an office roof) or are sited remotely and renewable energy is simply transported through the grid.

Direct investment: a company directly invests in on-site renewable energy assets and consumes the power. The assets are sometimes connected to the local grid for the sale of surplus power, the purchase of any deficit, and to assist with managing grid voltage and frequency. This is also known as captive power and is often popular in countries where the central supply is unreliable. RECs, if produced from this captive power source, must be retired by the company rather than sold in order for the company to claim that the power consumed is renewable energy. Surplus power and the associated RECs may both be sold, if applicable.

Figure 2 excludes those investment models where the focus is on selling renewable energy to others for profit; the CREX counts only renewable energy procured for companies' own use.

Figure 2: Main models for corporate use of renewable energy

Model	Pros	Cons
 Renewable energy certificate (REC) procurement	• Flexible and easy to implement, particularly if the trader is responsible for managing and redeeming the RECs. • No need to change power supplier.	• RECs are not globally tradable, in general. • Marketing opportunities are limited since the company is simply using RECs to offset its conventional power consumption.
 Green power procurement	• Easy to implement. • Multi-year supply contracts may be marketable as a commitment to renewable energy.	• Requires a change of power contract/supplier. • Limited marketing opportunities if the power is not asset specific; can be hard to obtain guarantees of origin and of additionality.
 Power purchase agreement (PPA)	• Power is provided by specific RE assets, which may be on-site: a more marketable story. • Provides a secure power supply. • Lower risk, as construction and maintenance costs are borne by the third party. • Additionality guranteed.	• Requires a long term commitment. • Limited flexibility if circumstances change.
 Direct investment	• Direct ownership of RE assets provides a very clear sign of commitment to clean energy. • Provides a secure and controllable power supply. • Ability to generate financial returns through selling the power. • Additionality guarantees.	• Requires an upfront investment. • Requires a long-term commitment. • Operation and maintenance of the asset is the responsibility of the company.

Responsibility or involvement from the company.

Source: Bloomberg New Energy Finance

Carbon offsets and green power

Many companies purchase carbon offsets (e.g. Certified Emission Reductions) in order to meet their sustainability goals. Carbon offsets are not necessarily generated by renewable energy projects, as they also cover projects such as energy efficiency initiatives and methane reduction. In addition, carbon offsets are measured in tonnes of carbon dioxide equivalent (tCO2e) rather than electricity (kWh), and these are not directly convertible quantities. As a result, carbon offsets are not classified as renewable energy in this year's CREX, although they are an important part of the sustainability strategy of many companies (see box "Leading the way down under" p13). Note that in contrast, carbon offsets were included in the 2009 and 2010 CREX report.

Additionality

An important concept in renewable energy procurement is that of "additionality". Additionality means that the purchase of the renewable energy, either directly or through a renewable energy certificate, introduces new renewable energy into the power mix beyond what would have happened without the incentive. With "renewable energy certificate" or "guarantee of origin" schemes, it is not usually compulsory for the generator to demonstrate that the project would only have occurred with the revenue from the credit. This differs from the rules associated with carbon offsets, as defined in the Kyoto Protocol Clean Development Mechanism. Companies often find it hard to determine whether specific credits or tariffs can guarantee additionality, particularly with green power where the information from the utilities is difficult to compare.

How green is green?

Another important consideration is the range of energy sources that are considered as renewable. Most definitions cover wind, solar thermal and photovoltaics (PV), wave and tidal, geothermal, biomass, waste-to-energy, and hydro-electricity, but exclude combined heat and power (CHP) and nuclear. Large hydro (defined by Bloomberg New Energy Finance as a facility with a capacity over 50MW) is sometimes excluded due to the negative environmental impact of large dams. In this report, all data and figures include large hydro unless stated otherwise.

Leading the way down under

National Australia Bank (NAB) has rapidly increased its procurement of renewable energy in recent years, reaching 100% of its total electricity consumption for 2011 (including carbon offsets). In 2011, NAB purchased 92% of its renewable energy via carbon offsets, with the remainder (15.9GWh) coming from spot market purchases of domestically produced RECs.

NAB procures a maximum of 30% of its offsets from any one technology in order to maintain a diversified portfolio.

A disadvantage of focusing on renewable energy, according to NAB, is the high cost of RECs. NAB plans to reduce their procurement of RECs on the spot market in favour of domestic offsets from the carbon farming initiative (CFI). NAB will continue to operate on a carbon neutral basis, procuring a wide range of verified carbon offsets, including but not limited to renewable energy offsets.

Rather than using third-party vendors for the RECs, NAB manages them in-house by leveraging the capabilities of its environmental markets desk. This appears to be a common strategy for financial institutions, which generally have the internal expertise to manage their own REC procurement.

NAB's renewable energy strategy started in 2007 as part of the company's carbon neutral target, which was effective from 1 July 2010. This approach is now incorporated in NAB's environmental agenda that encompasses climate change, resource efficiency and natural capital considerations.

National Australia Bank is one of Australia's "big four" banks with over 12 million customers and 50,000 employees.

Costs

There is a wide variation of prices for procuring renewable energy within each option, as explained in Section 4.4. For example, in government controlled regimes, the price of a REC may depend on the year of generation, the location of the facility, the relative supply and demand, and the type of power created. In a commercial market, the price simply depends on supply and demand, although demand may be shaped by those factors. Some companies have found the cost of green power now to be competitive with conventional power, as highlighted in the case study on the Royal Bank of Scotland (see box "Lending to renewable energy projects" p35).

Choosing PPAs for renewable energy

Infosys, a multinational IT consulting and software services organization headquartered in India, has made a commitment to use 100% renewable electricity by the end of 2017 in order to become carbon-neutral.

In 2011, Infosys procured 48GWh of renewable energy, 18% of its total electricity consumption, placing it second in the Indian company rankings for total renewable electricity use, although only eleventh based on the percentage of consumption. The company plans to increase this amount steadily over the next five years in order to meet its 2017 target, which will push it up future CREX rankings.

In India, renewable energy policies generally favour captive power consumption over selling electricity to third parties such as Infosys. Companies generating green electricity have to rely on the transmission infrastructure of the power distribution companies, which can present a challenge. Infosys has been lobbying the regulatory authorities to implement more favourable policies and is working with relevant industry bodies to aggregate green power demand data to enhance transparency and encourage financial support for green independent power producers (IPPs).

Infosys has chosen to focus mainly on sourcing renewable electricity through power purchasing agreements (PPAs) with local IPPs, since directly running power projects is not part of its core business. Two-thirds of this renewable energy is from wind, with the remainder from small hydro (33%) and solar (1%).

Infosys has made direct investments in two solar PV plants at its campuses in Jaipur and Trivandrum. However, it has experienced some challenges in operating these plants and so decided to rent its roof spaces to solar companies, which will invest and run the solar plants and provide the electricity to Infosys. Following the same principle, the company has recently signed a memorandum of understanding with a solar power generator to install solar equipment at its Chennai and Hyderabad campuses. With the help of attractive incentive schemes and falling solar module prices, Infosys expects solar energy to become an important component of its energy mix in future.

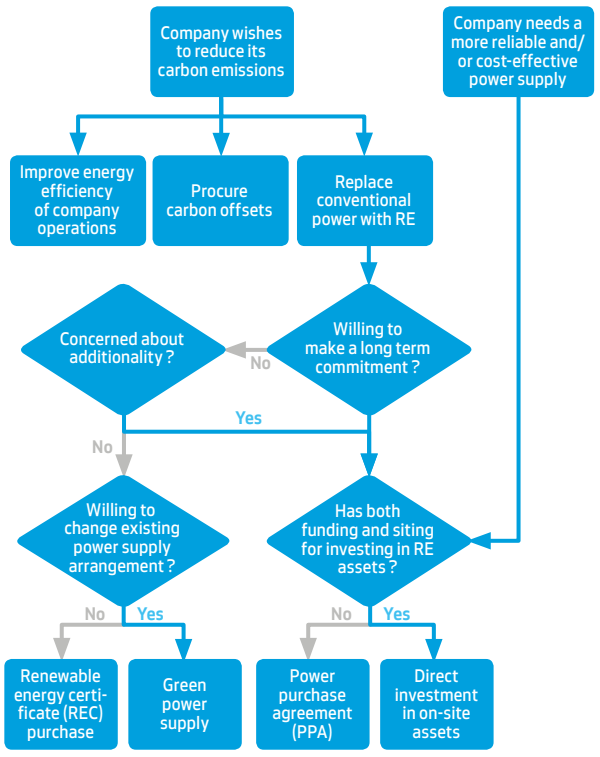
Infosys is a multinational IT consulting and software services organization with revenues of over US$ 6.9bn and 149,994 employees (at March 31, 2012). Infosys provides business consulting, technology, engineering and outsourcing services and has a global footprint with 65 offices and 74 development centres across the globe.

Decision process

RECs can be problematic as marketing tools because they are unfamiliar abstract financial instruments, symbolizing power generation that happens at a distance. Because most consumers understand neither how the electric power system operates nor the REC concept, they may consider the firm's REC purchase a sham transaction. Consequently the companies risk an unjustified accusation of "greenwashing". Power purchase agreements and direct investments overcome these issues, but require a greater level of commitment from the company financially and sometimes operationally.

The decision process taken by a company when choosing the best option for renewable energy use involves the consideration of several factors. A simplified example is provided in Figure 3. Many companies find the renewable energy market confusing and struggle to obtain the information that they need in order to make informed decisions. Marketing considerations are important, particularly the guarantee of additionality, the ability to have credits associated with specific assets, and other marketing benefits such as the ability to use a green power logo. More practical considerations include the availability and strength of regulatory incentives for renewable energy in a given region, the willingness and/or ability of a company to change power suppliers, and the feasibility of directly hosting or investing in renewable energy assets. Infosys, for example, uses PPAs from local independent power producers and some direct investment in renewable energy as a means of procuring its renewable energy (see box "Choosing PPAs for renewable energy" p14). The CREX survey results on the reasons for this choice provide some interesting insights and are detailed further in Section 4.1.

Figure 3: Example decision flow for the choice of renewable energy model



Source: Bloomberg New Energy Finance

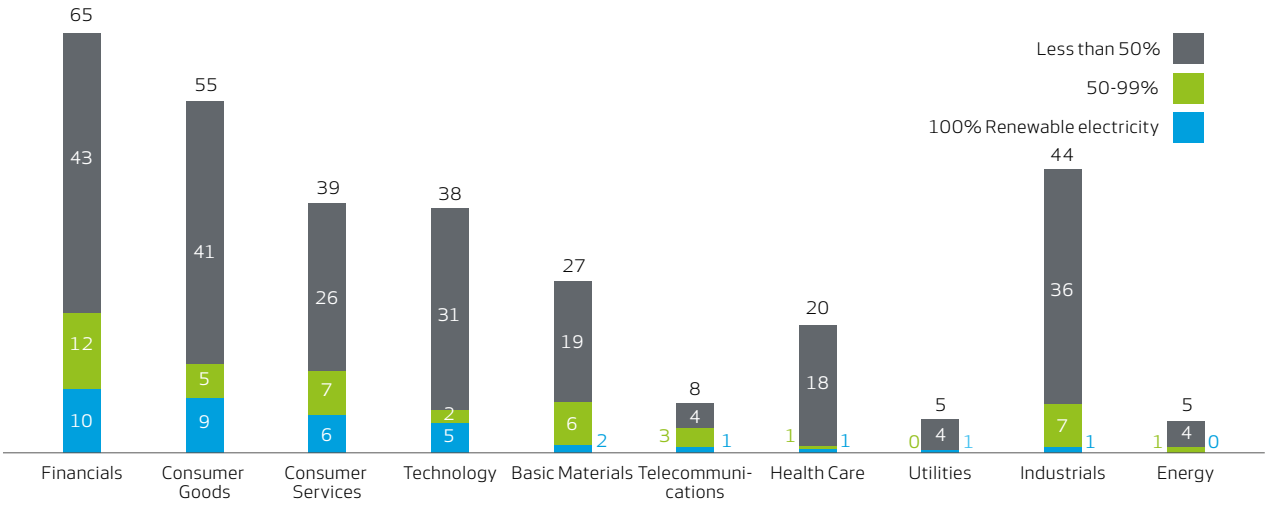
3. Renewable Energy **Ranking**

3.1. Ranking overview

The CREX participants are ranked based on the percentage of renewable electricity procured for their own use in 2011, calculated by dividing renewable electricity consumption by total electricity consumption for the period. A company with a 100% score is one that meets all of its electricity needs from renewable sources. If two or more companies have the same percentage score, they have an equal ranking even if they consume different total amounts of renewable energy.

The CREX ranking is topped by 36 companies that meet 100% of their electricity needs through renewable energy such as the Toronto Dominion Bank, Mohawk Fine Paper, Adobe Systems and Deutsche Wohnen. Overall there are 80 companies with a renewable energy percentage of 50% or more. For a breakdown of participant numbers, see Figure 4.

Figure 4: Number of companies in the CREX by sector



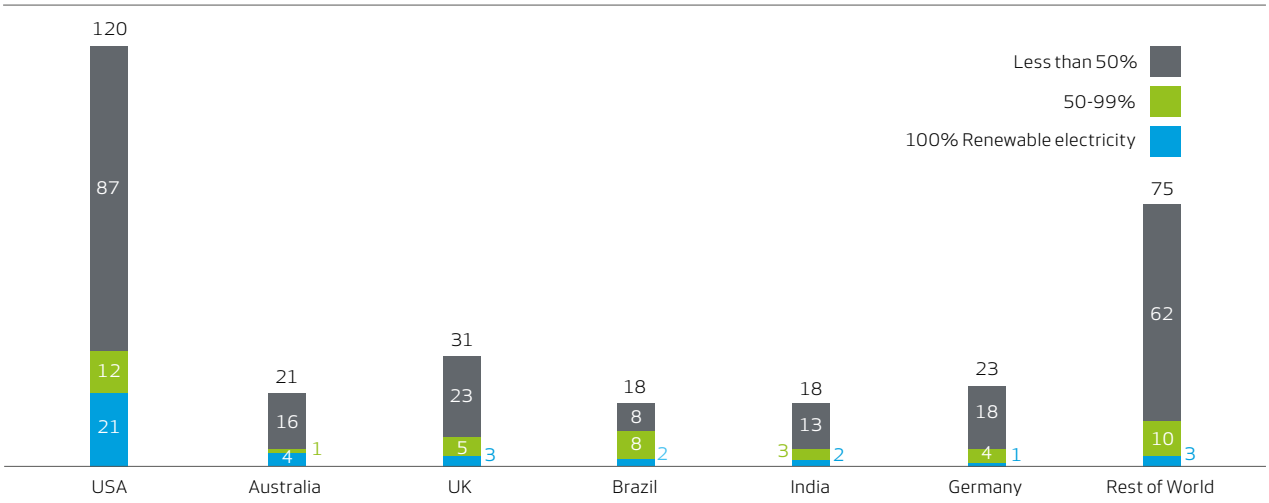
Source: Bloomberg New Energy Finance.

Credit should be given to companies with a lower percentage who take a more innovative or higher effort approach. Often such approaches have their place within overall sustainability strategies designed to maximise energy efficiency before buying renewable electricity. This includes the UK-based telecommunications giant, BT, which is on track to meet its ambitious goal of reducing its global carbon intensity by 80% of 1997 levels by 2020, and IKEA which has taken some innovative and high-tech steps to ensure that it sources its products sustainably and uses an increasing amount of renewable energy for its stores and distribution centres.

In the Telecommunications sector, represented here by companies such as BT, Deutsche Telekom, KPN and Sprint, companies tend to use a high proportion of renewable energy, on average. This may be because telecoms companies provide relatively undifferentiated products and services, so find sustainability marketing as a good way of reinforcing a brand identity.

The full CREX ranking (listed alphabetically, ranked by % renewable energy) can be found in the Appendix of this report.

Figure 5: Number of companies in CREX by country



Source: Bloomberg New Energy Finance.

From a regional perspective, the CREX ranking is dominated by companies headquartered in countries with mature markets for voluntary renewable electricity credits (North America and Europe in particular). There is also a wide variation in procurement levels around the world. Japan, for example, had little in the way of renewable policy incentives leading up to the 2011 reporting year and no REC market. This explains the low levels of procurement there, with what there is derived mostly from rooftop solar panels. We can expect an upswing in onsite investment in Japan from 2012, as the government has recently passed a feed-in tariff.

Table 2 lists the top-ranked companies in each sector. Companies in the Financials, Consumer Services and Consumer Goods sectors are more likely to be nearer the top of the CREX ranking. These companies – for example HSBC, Bloomberg, and Coca-Cola – tend to be consumer-facing and are therefore sensitive to the branding aspects of energy usage. In addition, companies in the Financials and Consumer Services sectors tend to have a low energy intensity, which means that renewable energy procurement is a relatively small part of their overall costs. Furthermore, it becomes easier to track and report energy usage in companies that are more centralised and with a lower energy usage. These factors may account for the greater participation in the CREX of companies in the three sectors..

Table 2: CREX 2011: Top-ranked companies in each sector*

Sector	Total valid entries	Top three companies
Financials	65	Toronto Dominion Bank (Canada)
		Washington Real Estate Investment Trust (US)
		NYSE Euronext (US)
Consumer goods	55	Associated British Foods (UK)
		Herman Miller (US)
		Interface (US)
Industrials	44	Autometal (Brazil)
		WEG (Brazil)
		Sto (Germany)
Consumer services	39	Kohls (US)
		Whole Foods Market (US)
		Pearson (UK)
Health care	20	AngioDynamics (US)
		Orion (Finland)
		Novozymes (Denmark)
Technology	38	Adobe Systems (US)
		Datapipe (US)
		Earthcolor (US)
Basic materials	27	Mohawk Fine Paper (US)
		Yash Papers (India)
		Fibria (Brazil)
Telecommunications	8	Deutsche Telekom (Germany)
		Koninklijke KPN (Netherlands)
		Republic of Everyone (Australia)
Energy	5	Vestas Wind Systems (Denmark)
		Centrotec (Germany)
		AMEC (UK)
Utilities	5	The Tower Co. (US)
		SNAM (Italy)
		Severn Trent (UK)

Source: Bloomberg New Energy Finance.

*Companies ranked by % renewable energy first, then arranged by volume of renewable energy in MWh

The CREX aims to identify those companies that have put in place discretionary policies to raise their renewable energy procurement levels. For this reason we have tended to consider only each company's percentage of energy consumption from renewable sources, since the absolute MWh procurement level is a function of the size of the company. Besides company size, there are other 'non-discretionary' factors which can prompt companies to use a greater amount of renewable energy. For example, smelters of aluminium (under 'Basic Materials') require a plentiful, reliable and cheap supply of electricity, which may favour siting near hydroelectric dams. Producers of sugar (Consumer goods) and pulp and paper (Basic materials) are able to generate energy by burning the biomass by-products of their manufacturing processes, leading to high levels of renewable energy use.

The 10 companies consuming the largest absolute quantity of renewable energy are listed in Table 3. Five of these companies are all in the basic materials sector of which two are manufacturers of aluminium (Alcoa and Vale) and the rest produce paper. Japan-based pulp and paper company OJI Paper, at the top of this table, consumed 37TWh last year, summed over its global operations, which is approximately equal to the domestic electricity consumption of New Zealand[7].

Deutsche Telekom obtains all of its renewable energy as RECs, to cover 48% of its total electricity consumption. The rest of the companies in Table 3 generate some or all of their renewable energy onsite.

Table 3: Top 10 companies by absolute renewable electricity procurement, 2011

	Company	Sector	Country	Total electricity, TWh	Renewable electricity, TWh	% Renewable	Global CREX rank by % renewable
1	OJI Paper Co Ltd	Basic Materials	Japan	37.0	20.5	55	71
2	Sto	Industrials	Germany	13.0	11.0	85	44
3	UPM-Kymmene OYJ	Basic Materials	Finland	15.9	9.0	57	69
4	Vale SA	Basic Materials	Brazil	14.5	7.5	52	76
5	Kimberly-Clark	Consumer Goods	USA	22.3	5.4	24	127
6	Nestle SA	Consumer Goods	Switzerland	37.3	4.5	12	167
7	Alcoa Alumínio SA	Basic Materials	Brazil	6.0	3.5	57	67
8	Deutsche Telekom	Telecommunications	Germany	6.4	3.1	48	82
9	Fíbria	Basic Materials	Brazil	3.1	2.9	94	39
10	Intel Corporation	Technology	USA	4.4	2.5	58	66

Source: Bloomberg New Energy Finance

7. New Zealand's electricity consumption in 2008 was 39TWh according to the CIA World Factbook, consulted September 2012: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2042rank.html

Walking the talk through sustainable operations

HASSELL, an international design firm, has environmental sustainability as a key focus of its designs for projects. They are recognised for being innovators in sustainable design and have designed over 1,000,000 square metres of projects certified or registered under the LEED and Green Star sustainable building rating schemes. The company is keen to "walk the talk" in sustainability through the running of its 14 design studios, driven strongly by the commitment of the board and employees.

HASSELL has steadily increased its procurement of electricity from renewable sources, reaching 62% (1,203MWh) in 2011. This, along with energy efficiency and other carbon emission reduction initiatives, has led to a 32% reduction in carbon emissions over a four-year period. In Australia, where the company has 5 studios, nearly all the operations were powered by renewable energy in 2011, allowing it to differentiate itself clearly from competitors.

The firm sources renewable energy for its Australia operations through the government-accredited GreenPower programme, where energy providers purchase renewable power on the company's behalf. HASSELL decided to use GreenPower because of its ease of implementation, the guarantee of additionality and the robustness of an officially accredited programme, despite cheaper methods of procurement being available.

However the firm has been unable to identify similar accreditation schemes in the other Asian countries in which it operates and so tends to focus more on reducing energy consumption through efficiency. This demonstrates the importance renewable energy accreditation programmes in order to make it easy for businesses.

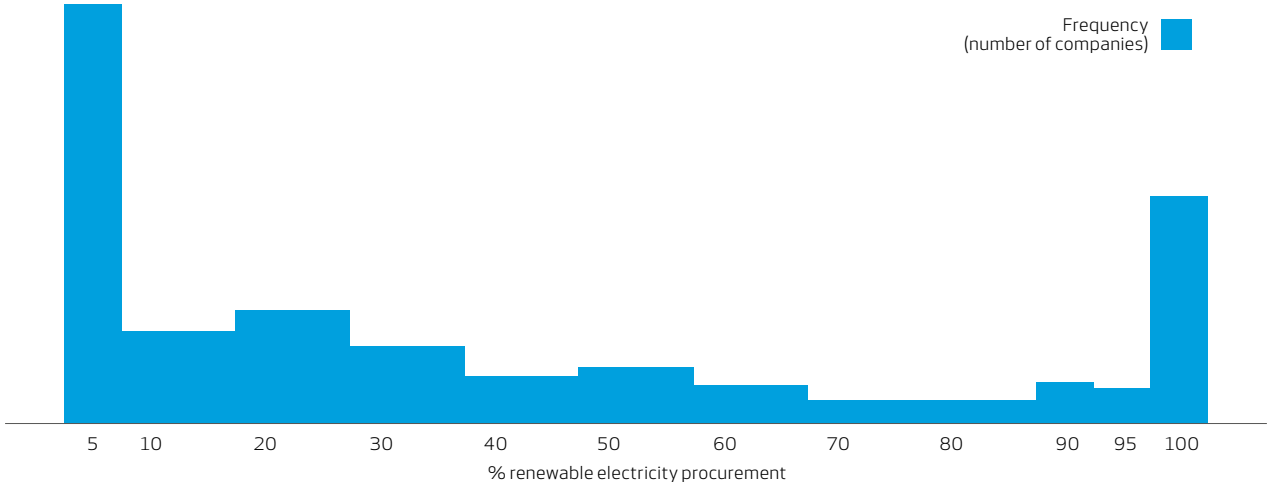
HASSELL is an international design firm with 14 studios in Australia, China, South East Asia and the UK. The company employs more than 900 staff, and was founded in Adelaide in 1938.

3.2. Voluntary renewable energy procurement levels are low, but rising

Most companies meet only a small proportion of their power needs through renewable energy. Figure 6 shows the number of companies with percentage renewable electricity procurement within a selection of ranges. There is a cluster of companies at the 0-5% level due to those survey respondents who only use a small amount of renewable energy, such as a single rooftop solar panel. Note that since the analysis excludes companies that use zero renewable energy, the peak in reality for the 0-5% bucket would be significantly higher. As expected, the number of companies declines in higher renewable energy bands, with one major exception. There is a large peak at the 95-100% level. This is driven by companies purchasing RECs to cover all their power usage, thereby providing a strong positive marketing message. Alongside these, the CREX includes a small number of energy-intensive companies that generate a large amount of renewable energy onsite, as discussed previously.

The global mean level of renewable energy procurement in 2011 is 11% and the corresponding median is 20%.

Figure 6: Responses to the 2011 CREX



Source: Bloomberg New Energy Finance.

Looking at the three-year trends, we see that voluntary renewable energy procurement levels are rising on average (see Table 4, 5 and 6). For companies that have provided three years' worth of data, the mean percentage of renewable energy has increased from 14% in 2009 to 16% in 2011.

Across all sectors and countries surveyed, renewable energy procurement as a percentage of total electricity used remained approximately constant or rose, sometimes substantially as in the case of Telecommunications and Consumer Services sectors. In addition, over half of this year's respondents state that they will procure more renewable energy in future.

The trends across regions and sectors are explored in more depth in later sections.

Table 4: Global average share of renewable electricity procurement, 2009-11*

	2009*	2010*	2011*	2011 (all)**
Total electricity procurement (TWh)	490	499	509	1,120
Total renewable electricity (TWh)	68	77	81	109
Average % renewable electricity	**14%**	**15%**	**16%**	**10%**

Source: Bloomberg New Energy Finance.

*Includes only the 181 companies with data for all three years.
**Includes all 306 companies with data for 2011

Table 5: Average share of renewable electricity procurement by country, 2009-11*

	2009	2010	2011	Sample size
Australia	16%	24%	49%	9
Brazil	50%	50%	54%	15
Germany	14%	17%	16%	15
India	4%	5%	7%	17
UK	15%	16%	16%	18
USA	8%	9%	10%	49
Rest of world	14%	14%	14%	58
Global	**14%**	**15%**	**16%**	**181**

Source: Bloomberg New Energy Finance

*Includes only the 181 companies with data for all three years.

Table 6: Average share of renewable electricity procurement by sector, 2009-11*

	2009	2010	2011	Sample size
Basic Materials	24%	25%	26%	19
Consumer Goods	14%	14%	13%	28
Consumer Services	11%	17%	21%	18
Energy	1%	1%	1%	4
Financials	23%	27%	29%	38
Health Care	5%	10%	11%	12
Industrials	3%	5%	5%	29
Technology	13%	15%	19%	24
Telecommunications	16%	21%	21%	7
Utilities	18%	20%	25%	2
Global	**14%**	**15%**	**16%**	**181**

Source: Bloomberg New Energy Finance

*Includes only the 181 companies with data for all three years.

3.3. Energy procurement strategies are usually set at board level

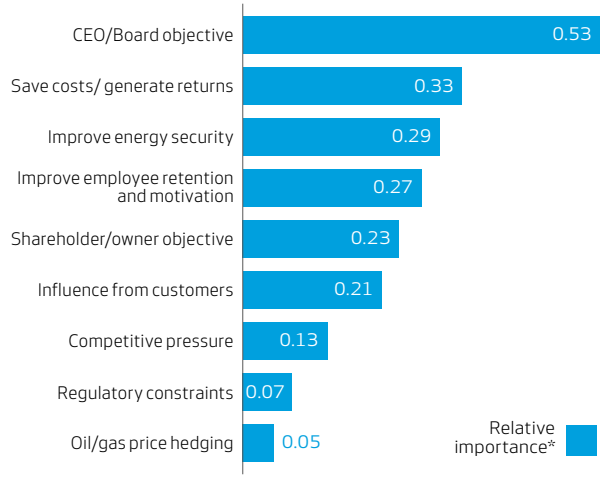
A key objective of the CREX survey is to bring transparency to the reasons and decision-making processes behind companies' procurement of renewable energy. As Figure 7 illustrates, for most companies the decision to procure renewable energy is taken at board level, generally as part of the company's corporate sustainability efforts. The marketing benefits of renewable energy in enhancing the "greenness" of the company brand are mainly focused on customers. However, companies also aim to enhance employee retention and motivation, as well as shareholder support.

For many companies, procuring renewable energy and operating in a sustainable way are closely aligned with business strategy. For example, architectural design firm HASSELL designs environmentally sustainable buildings and ensures that its own offices meet similar standards (see box "Walking the talk through sustainable operations" p18). This provides a powerful marketing message for its customers.

Although RECs and green power typically cost companies more than power from conventional sources, there can be financial benefits of renewable energy when directly investing in assets. Some companies find that renewable energy can improve their energy security, which is particularly important in countries with unreliable grid power such as India and where companies have energy-intensive manufacturing plants.

Figure 8 is similar to Figure 7 except that it looks at responses only from those companies procuring at least 50% of their electricity from renewables. For the 21 such companies that answered this survey question, we can see energy security is a higher priority than for the global average. For the 21 such companies that answered this survey question, we can see that shareholder/owner objective has a higher priority, while customers and competitor pressure have less. Oil and gas price hedging seem to have no priority in the decision for voluntary procurement of renewable energy in these companies.

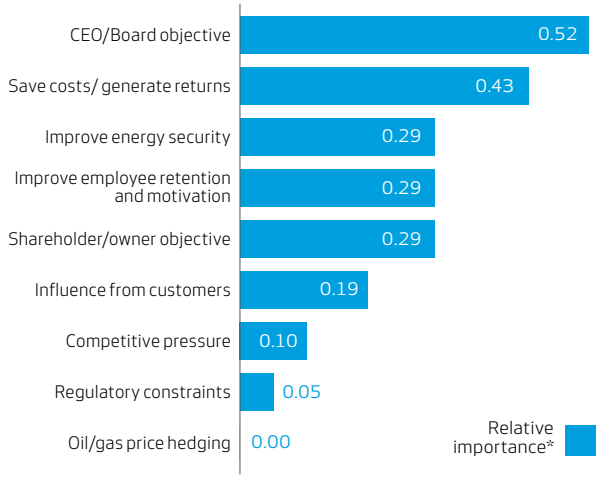
Figure 7: Reasons for voluntary procurement of renewable energy (Global), 2011



Source: Bloomberg New Energy Finance.

*The 'relative importance' for each reason was calculated by dividing the frequency of that reason by the total number of respondents to this survey question (150).

Figure 8: Reasons for voluntary procurement of renewable energy among companies procuring at least 50% renewable energy, 2011



Source: Bloomberg New Energy Finance.

*The 'relative importance' for each reason was calculated by dividing the frequency of that reason by the total number of respondents to this question that obtained at least 50% of their power from renewable sources (21).

Drive to carbon neutrality through transparent reporting

Deutsche Bank, an international investment bank, is delivering significant increases in energy efficiency and renewable energy procurement by having clear accountability and targets throughout the organisation. The environmental focus is driven by the board's desire to operate using responsible business practices while leveraging it as a competitive advantage. The bank believes that it is important to address the environmental concerns of key stakeholders, particularly customers and the general public. Clean energy is also an important part of Deutsche Bank's financial services offering, which it continues to expand.

Environmental targets are set at the board level by a steering committee. The board also has an advisory group, which includes climate scientists and environmental economists who provide insights into how global trends will impact the bank. For over five years, a detailed reporting infrastructure has tracked sustainability metrics in the bank's operations and promoted internal transparency and responsible decision-making. The bank has also formed partnerships with national and international organisations working in sustainability, thereby raising awareness on these issues internally and externally.

In 2007, Deutsche Bank set itself the goal of becoming carbon-neutral by the end of 2012, through improving energy efficiency, purchasing renewable energy and offsetting the remaining emissions by purchasing credits under the UN Clean Development Mechanism.

The bank's ambitious annual 20% energy efficiency improvement (from 2007 levels) was achieved by targeting 'quick wins' such as efficient lighting and passive motion detectors, while simultaneously considering other costlier options with longer lead-times. The bank's "Eco PMO" (performance management office) is responsible for implementing these initiatives.

In 2011, Deutsche Bank used 394GWh of renewable energy, some 73% of its total electricity consumption, placing it third in the CREX global banking sector rankings and fourth in the German company rankings for total renewable electricity use. The bank prioritises renewable energy as a power supply when it can verify the origin of the electricity and minimise the risk of double-counting. Onsite generation and specific power purchase agreements with generators are therefore usually preferred over green energy contracts and RECs in locations such as Spain and Italy that do not issue guarantees of origin.

The bank also has approximately 3MW of installed capacity globally, mostly solar PV and wind. In July 2012, Deutsche Bank's Americas headquarter at 60 Wall Street, New York City, won an award from the US Green Building Council for making the biggest environmental improvement. As well as implementing a substantial building energy management retrofit, the bank had installed a 123kW solar PV array on the roof, the largest such array in Manhattan and the highest in the US.

Deutsche Bank is a leading provider of financial services worldwide, and has 102,060 employees and operations in over 70 countries. Its market position is strong in corporate and investment banking as well as retail and private banking.

3.4. European companies favour renewable energy procurement more than companies in the US

A regional comparison of renewable energy procurement provides some interesting results, when looking at the countries in which the companies are headquartered, although not necessarily where their operations are focused (Table 7). The percentage renewable energy procurement of South American based companies appears to be much higher than that of those in other regions. However this is because the results in Brazil are dominated by big electricity users such as Grupo Pão de Açúcar, Vale and Alcoa that use high levels of biomass and hydro power.

Table 7: Comparison between continents

	North America	Europe	South America	Asia & Africa	Oceania	Global
Total electricity consumption (GWh)	469,000	199,000	41,000	408,000	4,000	1,120,000
Total renewable electricity (GWh)	24,000	40,000	21,000	23,000	73	108,000
Average % renewable energy per company*	5%	20%	51%	6%	2%	10%

Source: Bloomberg New Energy Finance.

* "Average % renewable energy per company" is calculated by dividing the total reported electricity consumption (summed over all respondents) by the total reported renewable electricity. Carbon offsets are not counted as renewable energy.

When comparing the two largest economic regions, participating European companies procure 20% of their power through renewable energy compared with only 5% for North American companies.

European respondents purchased a large amount of their renewable energy via RECs or green pricing programmes, which are available throughout most of Europe. Respondents were often based in Northern Europe, where the political and regulatory environment is relatively supportive of renewable energy and where guarantee of origin certificates are readily available. Furthermore,

consumers in Northern Europe generally have high expectations of companies in terms of sustainability and renewable energy, and these issues can easily be used to differentiate a company's brand from those of its competitors.

For example in the UK, British Telecom (BT), one of the world's oldest and largest telecommunications companies, has been systematically increasing its proportion of renewable energy procurement in order to differentiate itself from its competitors and become one of the world's greenest companies. It uses a wide range of procurement types and energy sources, and as of 2011 used 42% renewable electricity. In Germany, Deutsche Telekom takes a similar route in renewable energy procurement, but purchases a greater number of RECs, pushing it to 95% renewables.

In the US, however, parts of the country offer no or limited incentives for renewables. Although 38 states have some sort of Renewable Portfolio Standards, these standards vary from state to state. This illustrates the variability of political support and consumer sentiment across the country. However, the size of the US and its cultural bias towards transparency means that the country has had the largest number of participants in the CREX since 2009. The picture in Australia is similar in some ways to the US, in that government support mechanisms exist in most states but consumer support is patchy. In both regions, the procurement of renewable energy is a less powerful mean of branding differentiation than in Europe.

In India, despite the introduction of a dedicated ministry in charge of renewable energy, and the passing of the Electricity Act in 2003 with the intention of deregulating the power markets, there is still less open access and competition among generators, transmitters and suppliers of electricity than in liberalised markets in Europe and the US. Due to the limitations of the grid, it is often cheaper and more reliable for heavy users of electricity to build onsite generation. Note that there is a REC market in India, with no distinction made between compliance and voluntary RECs.

Government policy in Brazil heavily favours renewable energy, particularly from biomass and hydro sources. There are no feed-in tariffs and no market for RECs, but companies with a power consumption of at least 3MW (equivalent to energy consumption in the order of 10,000MWh per year) can enter into 'green' PPAs of various types. As in India, however, grid capacity issues mean that onsite generation is favoured for electricity-intensive operations.

3.5. Leaders in renewable energy procurement have integrated systems to track energy usage

The existence of an efficient energy management and reporting system is essential for companies that want to closely track their use of renewable energy. This is especially important for large multinational companies that have facilities and subsidiaries across a range of locations. Deutsche Bank is a good example of a company with a clear reporting structure for sustainability (see box "Drive to carbon neutrality through transparent reporting" p22).

We expect to have a growing number of companies in the CREX survey in the future, as companies implement reporting mechanisms for tracking this energy data.

Leveraging forestry resources to achieve clean energy self-sufficiency

Klabin S.A., Brazil's largest producer, exporter and recycler of paper, is on the path to becoming 100% reliant on renewable energy to meet its power needs through its own biomass.

Building on a long history of sustainable industrial practices, Klabin set a voluntary target to switch its electricity consumption entirely to renewable electricity from its own onsite facilities. The company projects it can achieve significant cost reduction from doing so compared with contracting electricity from its suppliers, which is becoming increasingly expensive. By doing this, it intends to maintain competitive pricing for its products, as many companies are moving production lines from Brazil to other Latin American markets due to high power prices.

In 2011, Klabin used 1,117GWh of renewable energy, 56% of its total electricity consumption, placing it sixth in the CREX industrials sector rankings and tenth in the Brazilian company rankings for total renewable electricity use. This renewable energy comes from direct investments in two small hydro facilities with a 25MW combined capacity and several biomass co-generation plants, to power Klabin's 16 factories in Brazil and one in Argentina. The company uses its own forest residues and black liquor as biomass feedstock, which is also used to generate heat apart from electricity for industrial processes, reaching up to 73% of total energy consumption in the company.

On its path to self-sufficiency, Klabin aims to rely mostly on biomass co-generation. However it is also exploring photovoltaic generation in a new factory currently under construction in Brazil. Building its co-generation capacity will enable Klabin to maximise the efficiency of its main feedstock, leveraging the 243,000 hectares of planted forests that it owns and leading to significant financial benefits.

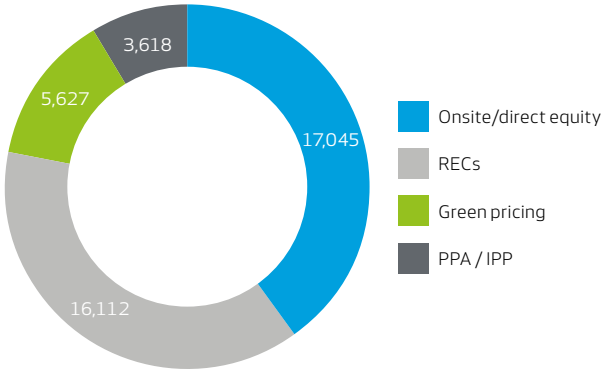
Klabin S.A is Brazil's largest producer, exporter and recycler of paper with 17 factories in Brazil and one in Argentina. As of 31 December 2011, the company had an estimated market value of BRL5.2bn ($3.13bn), generating a net revenue of BRL 3.7bn ($2.23), and selling 1,716 thousand tons of paper as well as 3,113 tons of wood.

4. Renewable Energy **Sources**

4.1. Both direct investments and purchasing credits are popular ways of obtaining renewable energy

As explained in Section 2.2, companies can obtain their renewable electricity directly in a number of different ways. However, such avenues are not always obvious to companies, which may be unaware of, or confused by, the variety of options available to them and by the lack of transparency in the market. Given this, it is perhaps unsurprising that a popular way for many companies to procure renewable energy is by purchasing certificates. However, this method accounts for only 38% of global renewable energy purchasing by companies. The most popular in terms of the amount of energy procured is direct investment, with 40% of the total in 2011 (see Figure 9). Figure 10 and Figure 12 tell a slightly different story: a small number of large energy users such as pulp and paper or car manufacturers accounts for the majority of direct investments, with a greater number of smaller users preferring RECs.

Figure 9: Global renewable electricity by procurement method, GWh



Source: Bloomberg New Energy Finance.

Direct investment in wind for captive power generation

Ruchi Soya Industries Limited, an Indian soya processing company, has made significant direct investments in wind assets in order to reduce its power costs and have better control over the source of its power supply. Electricity is a major expenditure when crushing soya seed and refining crude edible oil, significantly impacting the profitability of this low margin business. Utility tariffs have increased annually by 8-11% in the past five years and Ruchi expects it to grow at the same rate for at least another five to seven years. Therefore Ruchi has chosen to invest in wind power, including captive generating plants of its own use.

In 2011 Ruchi used 24GWh of electricity from renewable energy sources, 13% of its total electricity consumption. This is achieved through the use of captive wind power at seven manufacturing locations in four states of India. It installed its first captive power project in September 2004 in the state of Madhya Pradesh and based on this success it is now expanding into other Indian states where it has manufacturing sites. The wind power is fed into the grid and the electricity bill of the factory is adjusted by this amount, according to the Indian Captive Wind Policy. The factory has to pay only for the extra units of electricity which it has consumed after adjusting the wind electricity units. Since wind power has no fuel costs and the O&M cost is not only low but also predetermined for the first 10 years, Ruchi benefits from a predictable cost of power with reasonable escalation rates for about 20 years.

Ruchi undertook detailed analysis before investing in captive wind power including analysing factors such as the captive wind power policies in particular states, changes in utility electricity tariffs, load shedding patterns, and the electricity demand from the factory.

Overall, Ruchi has about 85.2MW of operational wind projects in five different states, of which a capacity of 16.1MW is being used to meet energy requirements of major manufacturing plants of the Ruchi Group. Ruchi was the first company in India to get its wind project registered under the Clean Development Mechanism of United Nations Framework Convention on Climate Change.

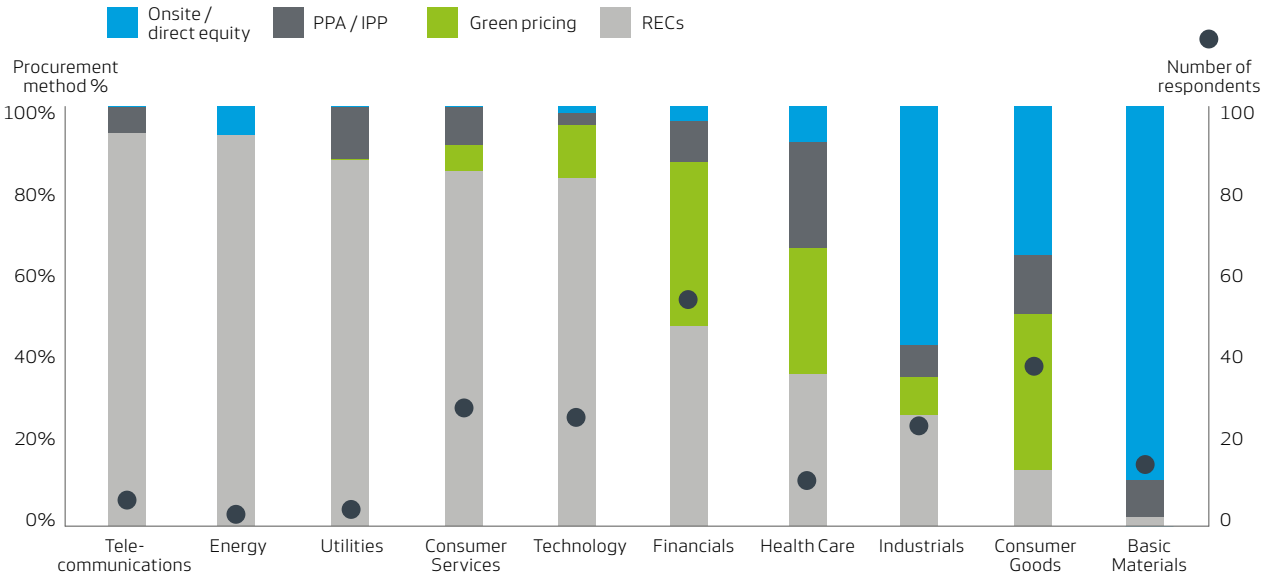
Despite the success of Ruchi's wind investment strategy in managing costs, it has faced several challenges. When wind power is tied up for captive purposes, the consumption of the factory has to be matched with wind power generation. However, wind power can be difficult to predict so it is hard to plan an accurate production schedule for the factories. Ruchi, like other wind investors in India, would also benefit if there was stronger policy support through longer periods for banking energy and a reduction in contract demand charges.

Note: Ruchi Group of Industries is a diversified group with activities in soya - processing, refined oils, galvanized sheets, cold rolled sheets, infrastructure development and power generation. It pioneered the formation of soya food processing industry in India and has an annual turnover of INR 250bn (USD 5bn) providing employment to more than 9,000 people. It is actively engaged in exports business with trading of oilseeds, edible oils and other agricultural commodities. Ruchi Soya Industries Limited is the flagship company of the Ruchi group.

The proportion of renewable electricity purchased as certificates, either on a voluntary market or directly from renewable energy projects, has been increasing among the subset of companies for which we have three years' worth of data. As explained in Section 2.2, the purchase of the environmental attributes associated with a specific project (i.e. RECs) is a relatively easy and cheap way for a company to claim it uses renewable electricity. Figure 11, on companies' reasons for choosing different procurement methods, confirms this: "low cost" and "ease of implementation" account for a substantial portion of companies' reasons for procuring RECs.

Contracting renewable electricity through a green supplier was the third most popular method, after certificates and direct investment. Similar to buying RECs this is a relatively straightforward way to procure renewable electricity. However, not all power suppliers offer these green power options and it may cost more per MWh than opting for RECs. This explains this option's somewhat lower popularity, at 12% of overall renewable electricity procured.

Figure 10: Share of renewable energy procurement methods by sector, 2011

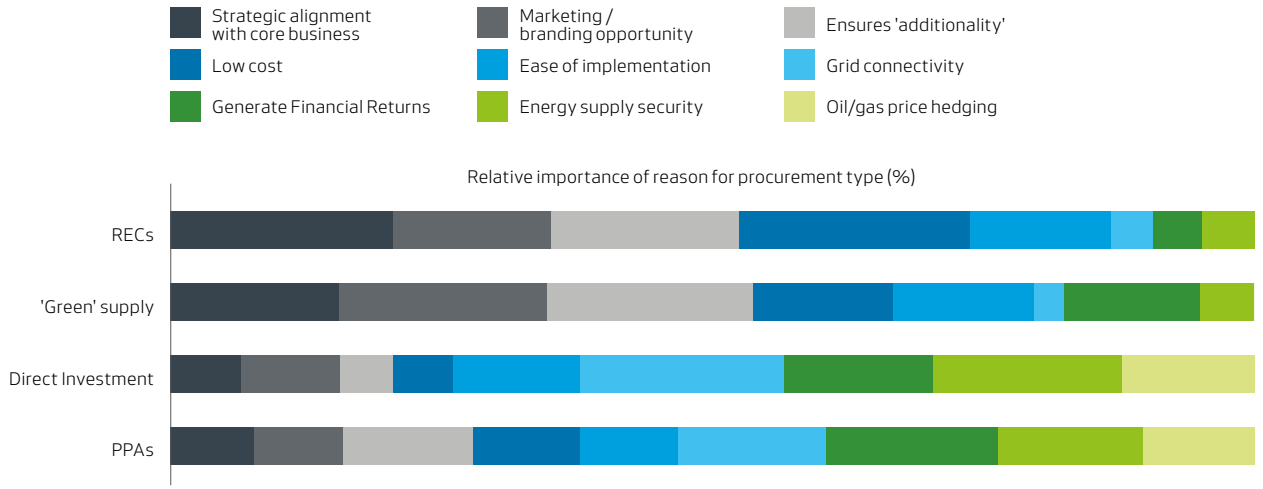


Source: Bloomberg New Energy Finance.

In Figure 10 we see the significant differences in procurement methods between sectors. At the left end of the chart, companies tending to have geographically dispersed operations and low energy intensities tend to find it more convenient to buy RECs. This would include operators of mobile telephone networks, utilities infrastructure, and office-based services companies. Toward the right, companies with large and concentrated power demands tend to invest in onsite generation facilities. This phenomenon is explored in more depth in the next section.

It should be noted that nearly one-third of respondents were unable or unwilling to identify the source and procurement method of their renewable energy.

Figure 11: Reasons for different procurement methods



Source: Bloomberg New Energy Finance.

*The 'relative importance' for each reason was calculated by dividing the number of times the reason was given by the number of respondents to this survey question. Totals for each procurement method were normalised to a percentage scale for comparison.

4.2. Direct investments in renewable assets can provide distinct benefits

Security of energy supply is a key challenge for many companies, and renewable energy can provide a cost effective solution.

Direct investment in projects accounted for about 40% of renewable electricity purchases in 2011. Of all possible methods to buy renewable electricity, direct investment involves the greatest commitment of resources. Nevertheless, it can often be a worthwhile investment for companies with a large electricity demand: the proportion of renewable electricity from onsite sources is highest in the Industrials (55%), Consumer Goods (25%) and Basic Materials (90%). Figure 11 shows that energy supply security and grid connectivity issues are the main reasons for selecting direct investment, and there is also the potential to generate revenue.

Some 32 companies in the 2011 survey stated that they procure all of their renewable energy from onsite or direct investments. Wind, hydro and biomass electricity can all be cost-competitive with fossil fuel power depending on the situation. The top four consumers of onsite renewable electricity, Alcoa, Duratex and Klabin (Brazil) and AB Foods (UK, with major operations in Brazil) all consume over 1TWh each from hydro and biomass sources (see Table 8), as common in Brazil. Associated British Foods, the second largest sugar producer in the world, obtains its renewable electricity from burning the biomass waste from its sugar production processes, thereby saving on costs for both electricity and waste disposal.

Xerox, Apollo Tyres and Ruchi Soya used over 86GWh of wind energy between them in 2011. This demonstrates the popularity of wind as a source of electricity even for high-demand users.

Table 8: Top 10 consumers of onsite renewable electricity

Company	Country	Industry	Total electricity (GWh)	Renewable electricity (GWh)	% onsite generation	Bio	Wind	Solar	Hydro
Alcoa Alumínio	Brazil	Basic Materials	6,026	3,452	100%	0%	0%	0%	100%
Duratex	Brazil	Industrials	2,272	1,799	100%	100%	0%	0%	0%
AB Foods	UK	Consumer Goods	1,575	1,574	100%	100%	0%	0%	0%
Klabin	Brazil	Industrials	1,975	1,118	100%	97%	0%	0%	3%
Bunge Brasil	Brazil	Basic Materials	699	306	100%	100%	0%	0%	0%
Asahi Kasei Corp.	Japan	Basic Materials	2,900	261	100%	0%	0%	0%	100%
V & M do BRASIL	Brazil	Basic Materials	312	99	100%	(Not answered)			
Xerox Corporation	USA	Industrials	457	35	100%	0%	100%	0%	0%
Apollo Tyres	India	Consumer Goods	275	26	100%	0%	100%	0%	0%
Ruchi Soya	India	Consumer Goods	188	25	100%	0%	100%	0%	0%

Source: Bloomberg New Energy Finance.

Tax incentives and an energy banking facility for renewable electricity have made wind investments popular in India. Most captive wind energy users generate electricity in the windy months of the year and, depending on the state policy, bank the energy for future use. Energy banked in this way must be consumed before the end of each financial year in March. This presents a supply problem in certain states where the windy season starts in May.

The average level of renewable energy procurement amongst Japanese respondents was higher than for all countries but Brazil and Germany. These Japanese companies do purchase some RECs, but among the survey respondents, onsite sources such as rooftop PV provide over 70% of renewable energy procurement.

Premium brand builds a reputation for sustainability

BMW Group, the German based car manufacturer, sees sustainability throughout the value chain as inseparable from its success, and part of its corporate self-image. A signatory of the UN Global Compact and the UNEP Cleaner Production Declaration since 2001, the company has consistently worked to minimise its environmental impact. BMW's sustainability strategy is set by a series of annual meetings that ensure participation and information-sharing at board level. This strategy is clearly having an impact: last year the company achieved top rankings in its class for both the Carbon Disclosure Project and Dow Jones Sustainability Index.

BMW's environmental strategy includes targets to reduce energy and resource consumption for each vehicle produced and also to enhance the sustainability performance of its products during their lifetimes. In addition, an efficient reporting infrastructure has been implemented, allowing BMW to publish prompt updates on its energy consumption and emissions figures.

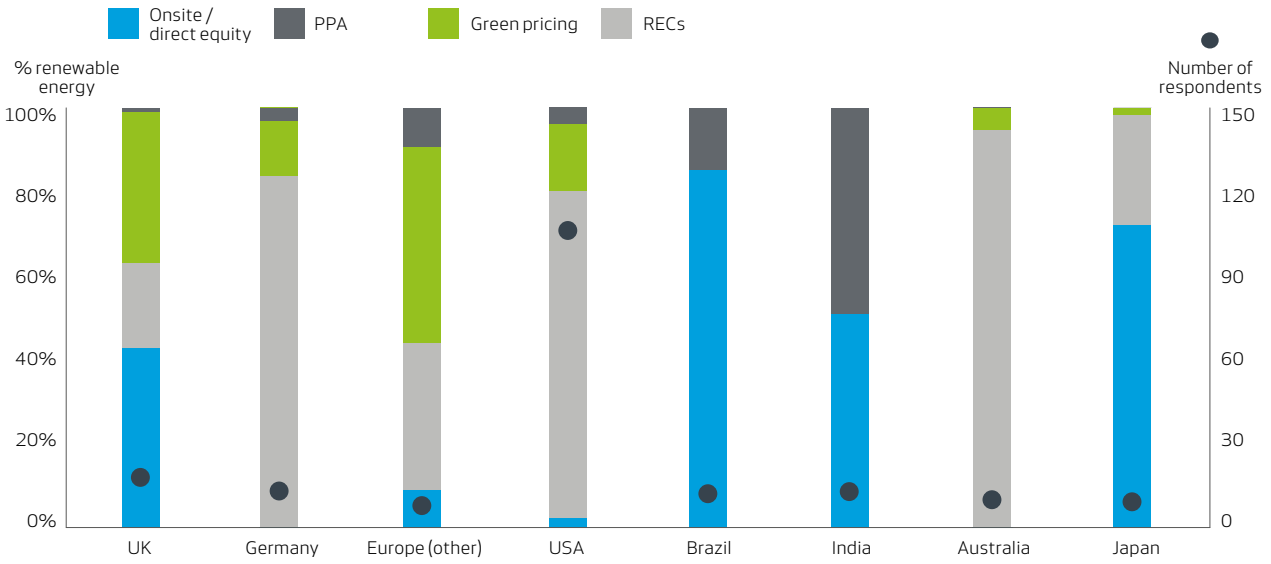
The procurement of renewable energy is one of the company's stated sustainability objectives. In 2011, BMW used 329GWh of renewable energy, 19% of its total electricity consumption, placing it sixth among German companies in the CREX rankings for total renewable electricity use. Much of this renewable energy was obtained through the purchase of green energy contracts, which the company chooses based on the origin of the green energy and economic considerations. BMW has also invested directly in wind assets at its Leipzig factory, which will be powered by four wind turbines. Started in 2012, the project cost is about EUR 400m and will power the production of the BMW i3 by 2013.

By 2015, the company aims to generate a location-specific roadmap on the use of renewable energy. This will allow it to replicate the success of the Leipzig factory, generating electricity onsite wherever possible, delivering a strong marketing message in line with its premium brand.

Founded in 1917, BMW is one of the world's top car manufacturing brands. From the group's Munich headquarters, it oversees manufacturing operations in over a dozen countries under BMW, Mini, Rolls-Royce, Husqvarna and other marques. BMW is known for its high-quality design, and in June 2012 Forbes listed BMW as the "world's most reputable brand".

The trend for Brazilian and Indian energy-intensive companies to consume large amounts of onsite renewable energy is made even clearer in Figure 12. The reliability of power from the grid is a serious issue for companies based there, particularly for energy-intensive manufacturers. Onsite electricity generation can provide energy security, if operational without the grid, or with associated battery storage. Both India and Brazil have a high percentage of renewable energy coming from PPAs and onsite sources compared with the other countries the CREX (see box "Leveraging forestry resources to achieve clean energy self-sufficiency" p23).

Figure 12: Share of renewable energy procurement methods by country, 2011



Source: Bloomberg New Energy Finance.

4.3. Hydro, wind and biomass are the most popular sources of renewable energy

Hydroelectric power is by far the most popular form of renewable energy in the CREX, with 47% of the total known share (when the technology source is known). This is followed by wind, with 29%, and biomass and waste-to-energy, with a combined 23%. These data are shown graphically in Figure 13. These results are significantly influenced by the big electricity users in Brazil that use high levels of biomass and hydro power.

Much of the hydroelectric power reported in the CREX falls under the BNEF definition of 'large hydro'. These power sources have specific attributes and may not be easily verifiable as sustainable or 'additional', as explained in Section 2.2. However, construction of large hydro facilities has been favoured by some governments as a source of non-fossil fuel energy and we include it in this analysis.

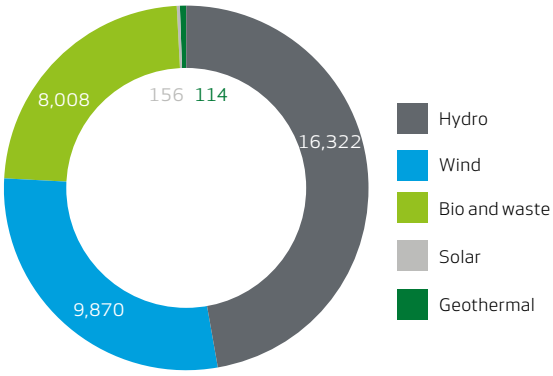
Wind is favoured by companies looking for a cost-effective addition to a renewable energy portfolio where hydro power may not be available, or where the company is concerned about additionality. Companies such as BMW are able to use onsite renewable energy to promote their sustainability credentials while also sourcing power at a competitive price. For this purpose, wind turbines are a particularly visible sign to customers of a company's commitment to renewable energy (see box "Premium brand builds a reputation for sustainability" p27). Meanwhile another energy-intensive company, Ruchi Soya, based in India, is able to use onsite wind generation to make its electricity costs more predictable and stable (see "Direct investment in wind for captive power generation" p24).

'Bio and waste' generation here includes biomass, biofuel and waste-to-energy. Biomass generation involves the burning of organic matter, usually agricultural waste, to generate power with a similar process to that used in conventional coal-fired power stations. Waste-to-energy is the incineration of municipal trash and landfill gas to produce power. These processes are used to a large extent in Brazil, where policies and resource abundance create favourable conditions, and by the pulp and paper industry. Smaller-scale facilities, such as that powering BSkyB's headquarters, are less well represented in the sample but are often more innovative and may have required a particular effort or decision by companies to implement.

Solar is a small proportion (<1%) of total renewable energy generation. This is somewhat expected given solar's 5% share of global renewable electricity capacity[8,9]. The cost of solar has been relatively high until recently, power output is dependent on geography and weather, and the technology is less easily scaled up to large capacities than some other technologies. However, with the recent plummeting of PV prices, we can expect solar energy's share to grow in future.

Geothermal electricity is an even smaller proportion of the total than solar because it has higher capital costs and is highly dependent on geography.

Figure 13: Share of each renewable electricity source globally in 2011, GWh



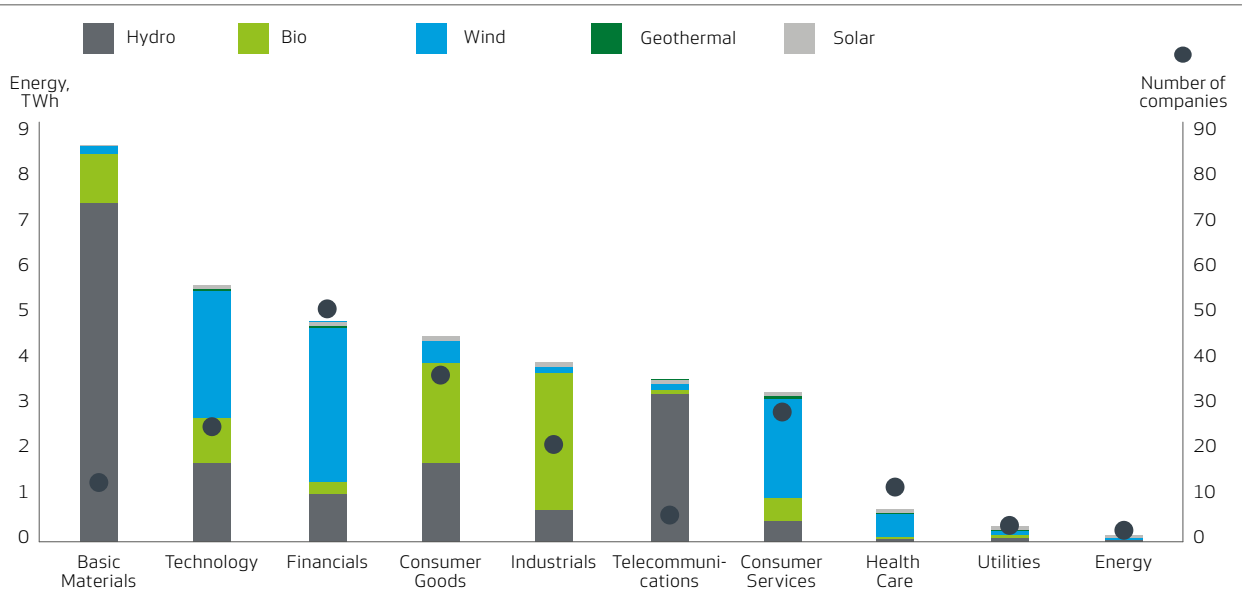
Source: Bloomberg New Energy Finance.

8. Global installed capacity figures from the Bloomberg New Energy Finance database, August 2012 (we quote the renewable figures including large hydro)

9. Note that installed capacity is a theoretical maximum output power in megawatts (MW), whereas generation and consumption of energy are measured in MWh.

Some interesting sector trends can be seen in Figure 14, especially when cross-referenced with Figure 10. Telecommunications companies appear to be buying a large share of their renewable energy from hydro power, much of which is bought as RECs. As previously discussed, basic materials and consumer goods companies, with their large and highly concentrated energy needs, often draw on hydro power in the form of an onsite facility. The sectors buying the largest share of wind power, such as the Technology, Financials and Consumer Services sectors, are also those sectors that tend to buy renewable energy to enhance and communicate their brand values rather than for their balance sheets.

Figure 14: Renewable energy from each source by sector, 2011



Source: Bloomberg New Energy Finance.

Blended approach to clean energy procurement

Grupo Pão de Açucar, Brazil's largest supermarket chain, has set a voluntary target to procure 40% of all its power needs from renewable sources by 2014. In 2011, the company used 296GWh of renewable energy, 28% of its total electricity consumption, placing it fifth in its sector (Consumer Goods) for total renewable electricity use and seventh based on percentage.

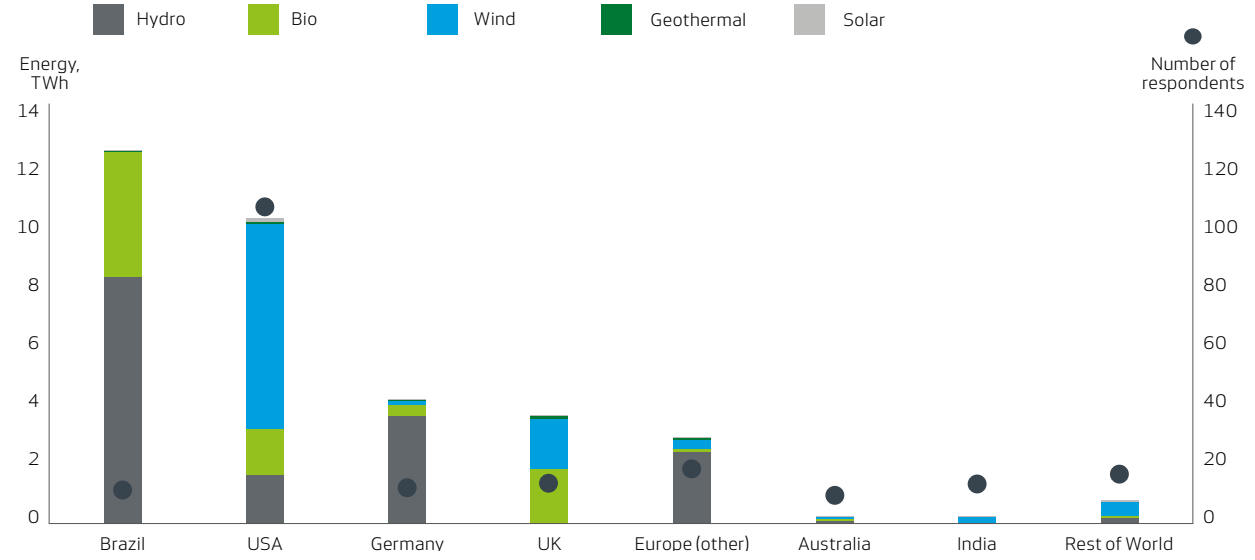
74 of Grupo Pão de Açucar's 900 food retail stores use some form of renewable electricity. The company headquarters in São Paulo and one of its main distribution centers in Rio de Janeiro, the two most energy-intensive operations, also use green energy. This energy is procured through long-term PPAs with power producers. In 2006, Pão de Açucar signed bilateral contracts with four small hydro plants with 86MW of combined capacity and one biomass plant.

In the future, the company plans to change the way in which it contracts renewable electricity, away from bilateral, long-term contracts with generators towards a 'green pricing' approach, where it contracts "blends" from third party marketers or power commercializers. Grupo Pão de Açucar has not disclosed the details of its intended supplier or the contract terms. This blended contracting approach provides Grupo Pão de Açucar with a potentially lower-cost solution for procuring renewable energy, enabling it to increase procurement levels. However the benefits of its renewable energy investment will be harder to attribute compared with a bilateral agreement, so there is a trade-off from a marketing perspective.

Grupo Pão de Açucar is Brazil's largest supermarket chain, with 1,800 retail stores and 140,000 employees.

Looking at the country cut (Figure 15), hydro generally forms a major part of the renewable energy mix, particularly for companies in continental Europe and Brazil. In Europe, guarantees of origin can be obtained easily and cheaply for hydro power, while in Brazil much of the energy recorded in the CREX is captive generation for energy-intensive industry.

Figure 15: Renewable energy from each source by country, 2011



Source: Bloomberg New Energy Finance.

Renewable energy with wood chips and wind turbines

In 2006 British Sky Broadcasting Group (BSkyB) became Europe's first carbon-neutral broadcaster, and in 2011 it obtained 83% of its electricity from renewable energy sources (or 100% if carbon offsets are included). BSkyB believes that a reputation for environmental responsibility is important in attracting consumer and business customers, and also helps attract and retain talented employees whose values are aligned with these goals.

In 2010, BSkyB launched the Sky Rainforest Rescue campaign, which aims to preserve three million hectares in Brazil from deforestation, and has partnered with organisations such as the WWF (formerly World Wildlife Fund). BSkyB also procures a significant amount of its energy needs from wind farms owned and operated by SSE (formerly Scottish and Southern Energy).

A recent focus has been on the building of new GBP 233m studios in London, powered by renewable energy. These are considered by some as Europe's most energy-efficient broadcasting facility. BSkyB generates up to 40% of the energy for this new facility through a wood chip-fuelled combined cooling, heating and power plant, the first large-scale facility of its type in the UK. The Turboden Organic Rankine Cycle turbine uses 32 tons of wood chips a day when at full capacity to generate power, hot water and chilled water. BSkyB also erected a 100kW wind turbine which is expected to provide over 133MWh/year of clean energy for the new facility. BSkyB aims for all company-owned sites to derive at least 20% of their energy needs from on-site renewable sources by 2020.

BSkyB also committed to cut its greenhouse gas emissions levels by 25% between 2008-09 and 2020, and to increase energy efficiency by 20% by 2020 from its 2008-09 baseline. A range of initiatives have been introduced to meet these targets, such as reducing the energy consumption of buildings by raising awareness among employees, and improving equipment efficiency and energy management systems.

British Sky Broadcasting Group (more commonly "BSkyB" or simply "Sky") entertains more than 10m households through a multichannel, multi-platform television service in the UK and Ireland. BSkyB received the third-best score of any non-financial company in last year's ET Europe 300 Carbon Rankings, conducted by non-profit research group The Environmental Investment Organization (EIO).

4.4. Companies typically spend a small proportion of their revenue on renewable energy

The average price per MWh for renewable energy provided by the survey respondents is shown in Table 9. Not all the prices are consistent with typical industry values. The REC prices quoted by the respondents, at an average of $17/MWh, are considerably higher than the cost of voluntary RECs in the US. This maybe because RECs outside the US tend to be more expensive or because companies are buying RECs with specific characteristics (eg, locally sourced power), which are more expensive than generic "national blend" ones (see box "Blended approach to clean energy procurement" p30).

The PAA prices quoted by the respondents, at an average of $102/MWh, are in line with the higher range prices for US renewable PPAs signed by utilities in the first half of 2012. The direct investment prices are high in comparison to wind but in line with BNEF estimates for levelised cost of energy for owning PV assets in the US.

The spread of prices across the procurement methods is large, with direct investment showing an average cost of ten times the procurement of RECs. This spread is due to a number of reasons, such as:

- The broad scale and nature of the technologies involved means that prices are variable. For example, energy from hydro plants can be much cheaper than fossil fuels under the right conditions but unit costs of the order of USD180/MWh for PV are not unheard of.
- The price of some RECs may only partially reflect the additional cost of bringing renewable energy onto the grid, for example if they are bought from renewable energy facilities that benefit from other forms of financial support. Other guarantee of origin certificates, here counted as RECs, sometimes originate from established plants with few remaining capital costs. Many guarantees of origin in Europe, for example, originate from decades-old hydro plants and therefore do not demonstrate "additionality".
- In regions where a separate voluntary market for RECs does not exist, REC purchases must come from the compliance market, at much higher costs.
- PPAs, green supply and direct investments all include the cost of the electricity supply whereas a 1MWh REC is only the environmental attribute, and can only supplement conventionally supplied electricity.
- The quoted prices per MWh for PPAs and direct investment depend on a wide array of factors such as accounting methods, finance costs and expected equipment lifetimes.

Using data from the Bloomberg Terminal on revenues of publically listed companies we calculate that the total cost of renewable energy is a small proportion of the companies' revenue on average (under 0.02%). The exceptions to this, among the companies that disclosed pricing information, are Alcoa Brazil and WEG Industries in Brazil, both of which are manufacturing companies whose operations require large amounts of energy.

Table 9: Mean and standard deviation of prices for renewable energy

	RECs	Green supply	PPAs	Direct investment	Global average*
Mean price (USD/MWh)	17	44	102	181	39
Standard deviation (USD/MWh)	29	52	80	286	105
Sample size	41	15	15	12	83

Source: Bloomberg New Energy Finance.

*Average calculated over all data entries, weighted by amount of energy procured using each method.

5. Future Trends And Implications

5.1. Renewable energy is increasingly seen as a business opportunity for companies in a range of sectors

Companies do not just see renewable energy as a way of greening their operations. For many, across a range of sectors, renewable energy offers a growing business opportunity. For example, financial institutions such as the Royal Bank of Scotland (RBS) are increasingly lending money for renewable energy projects through dedicated departments. As a result, RBS has developed an industry-leading practice in providing finance to clean energy, in addition to purchasing renewable electricity for its own operations (see box "Lending to renewable energy projects" p35).

Deutsche Bank, whose reporting systems are profiled in Section 3.5, is another financial institution that views the "greening" of its brand as an investment in relationships, expertise and systems that will give it a strong position in the growing clean energy market. Although it accounts for only a small amount of the bank's revenue today, the renewable energy sector is a growth area and represents a major opportunity.

Manufacturers are also moving into the renewable energy space, adjusting their products and services to meet the needs of the growing market.

Topping the charts while continuously innovating

Intel, the US-based semiconductor chip manufacturer, ranks near the top of renewable energy procurement rankings; for the past five years, it has been the largest voluntary purchaser of green power in the US, according to the EPA. The company is notable for its innovative sustainability efforts.

Intel's strategy for emissions reduction and energy management uses a portfolio approach and draws on some key focus areas such as: green power purchases, on-site solar installations, energy efficiency, and efficient building designs. Since 2007, the company has cut its greenhouse gas emissions by more than 60% (from 3.9 MMTCO2e to 1.4 MMTCO2e in 2011). In 2012 the company met many of its production-related environmental goals and is setting several new ones for 2020. The aim of these is further to reduce greenhouse gas emissions and water use and to save 1.4 TWh of energy from 2012 to 2015.

In 2011, Intel was the first semiconductor producer to obtain LEED Silver Certification for an entire manufacturing campus. Its environmental commitment is so pervasive that the company includes an environmental component in the formula used to determine bonuses for employees.

For renewable energy, Intel increased its renewable electricity usage by 75% in 2011, from 1.43 TWh to more than 2.5 TWh, representing approximately 85% of the company's US energy consumption. The company recently announced that it has increased its annual purchase of renewable energy to cover over 2.8 TWh, almost 90% of its US electricity use. This procurement, mostly of Green-E certified RECs, comes from a portfolio of wind, solar, small hydro, geothermal and biomass sources. The company hopes that this will "spur the market" to reduce the long-term costs of renewable electricity.

Intel also contracted third-party installations of 15 solar electric systems across nine campuses in the US (including a 1MW system on a California campus), Israel and Vietnam and is continuing evaluation and implementation of facilities where it makes business sense. Intel further supports renewable energy adoption by educating its employees for any vendor purchase discounts for home solar installations. The company's chips are also notable for their intelligent energy management, helping to reduce the energy draw of the world's computers and electronic devices. Intel is also investing in research to apply technology to enable a high-tech, low-carbon economy, including the recent creation of the Intel Energy and Sustainability Lab.

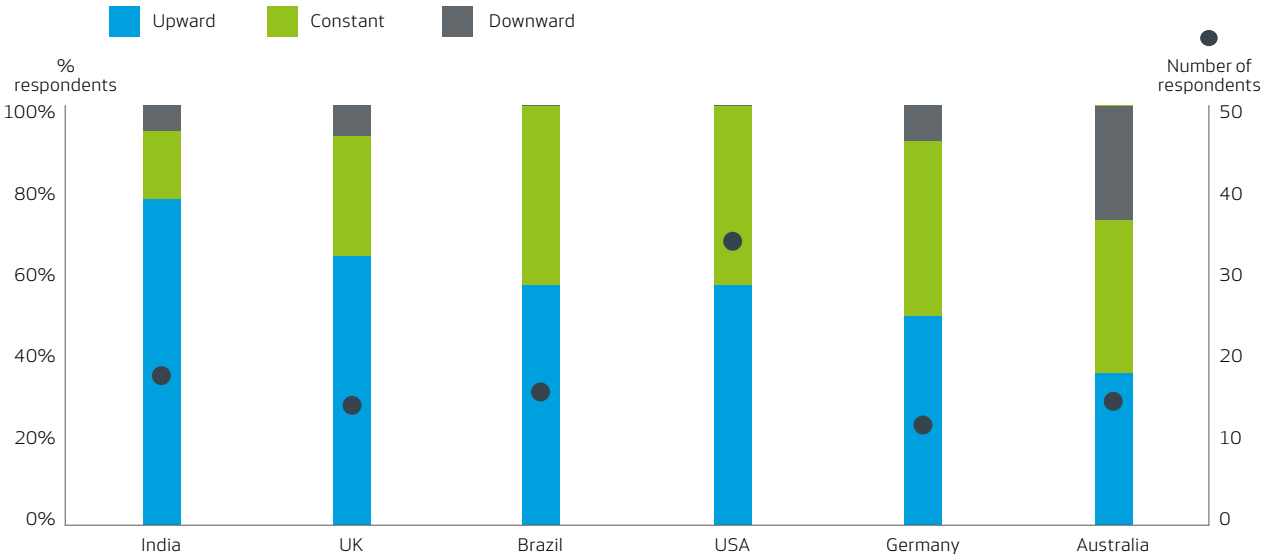
Intel is a semiconductor chip manufacturer with about 100,000 employees (as of 31 December 2011). It has received numerous awards for its environmental efforts including number one 'green company' in the US (Forbes, 2011), Green Power Partnership Partner of the Year (EPA, 2008-11) and Inaugural Climate Leadership Award in recognition for excellence in GHG management (EPA, 2012).

5.2. The voluntary purchase of renewable energy will continue to grow

As mentioned in Section 2.1 voluntary renewable energy markets saw steady growth up to 2011. Figure 16 shows the respondents' expectations of their future renewable energy procurement by sector and by country. Over half of the respondents said that they would procure more renewable energy in future. This reflects the ambition of the many companies such as Intel (see box "Topping the charts while continuously innovating" p33) that see an opportunity to build up the integrity of their brands by increasing their procurement of renewable energy.

Many companies begin their sustainability strategy with a focus on energy efficiency, which tends to be relatively easy to implement and can have clear cost benefits and shorter payback periods. The more ambitious companies, such as those taking part in the CREX survey, then shift the focus to renewable energy and tend to set steeper targets. For example, The Hartford, a US financial services company, initially focused on energy efficiency rather than renewable energy in order to reduce its carbon footprint. In 2011, it revised its greenhouse gas reduction targets and substantially increased its renewable energy credit purchases (see box "Rapid ramp-up of renewable energy procurement" p36).

Figure 16: Expectations of future renewable energy procurement levels by country (up/down/constant), % respondents

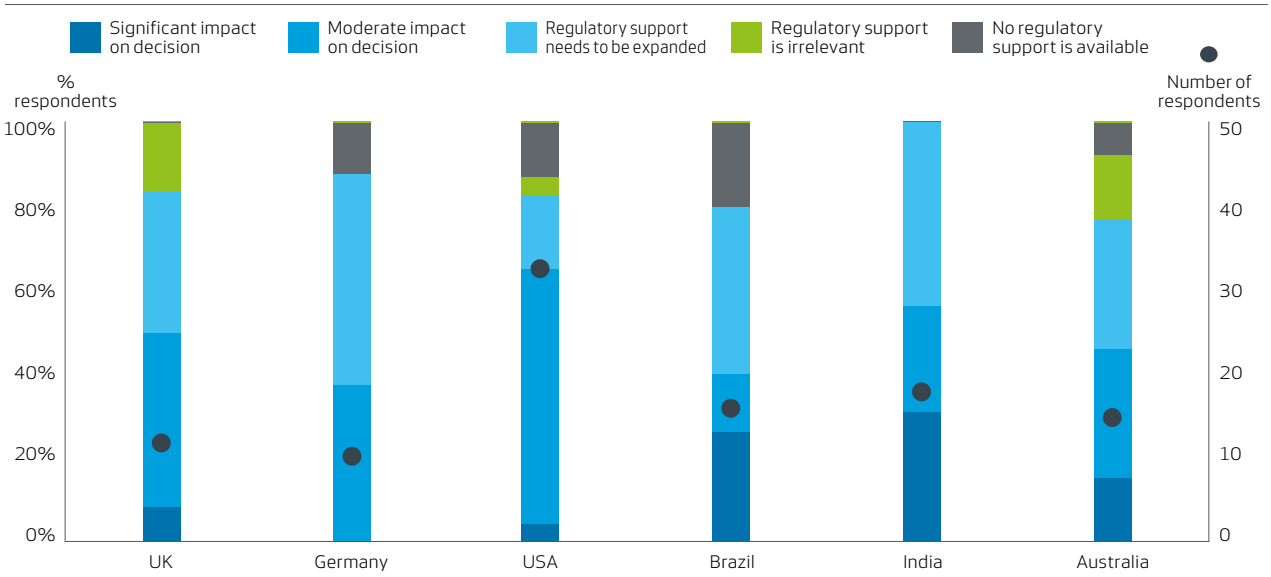


Source: Bloomberg New Energy Finance.

5.3. Growth of the voluntary market depends heavily on political and regulatory support

Political and regulatory support is essential for the growth of renewable energy capacity, particularly where demand can be driven by marketing interests rather than energy security. However this support varies considerably between countries. For the six focus countries, Figure 17 shows the impact that companies believe regulatory support has on their decision to procure renewable energy. In all countries there are companies calling for an expansion in regulatory support for renewable energy. Clearly governments and policy makers play a significant role in enabling renewable energy to grow by setting up the conditions in the market, for example, liberalising power markets, supporting incentive schemes or taxes on carbon dioxide emissions.

Figure 17: The impact of regulatory support on companies' decisions to procure renewable energy



Source: Bloomberg New Energy Finance.

Note: only countries with at least 10 responses for this question are shown

Lending to renewable energy projects

The Royal Bank of Scotland (RBS) loaned twice as much as any other bank to renewable energy projects in the UK during 2011. It is also actively reducing its carbon footprint and is procuring renewable energy for its own operations. As a result, RBS is now a major player in green power in the UK.

In 2011, RBS set a goal of being "a leader among its peers by 2015", in reducing and managing its carbon footprint. It has put in place a far-reaching programme of initiatives and targets to cut business-related emissions, energy use and office waste.

In terms of renewable energy procurement, RBS bought 61% of their total electricity consumption, 634GWh, from renewable sources. Of this total 97% came from green pricing programmes and 3% from RECs. This gives it the largest total renewable electricity use (in MWh) in its sector.

RBS is also active in renewable energy through its financial services business, both in the UK and internationally. In the US, RBS arranged and distributed $1,782m of debt capital in 2011, both directly to renewable energy companies and to finance assets that directly support renewable energy.

The bank believes that loans for renewable energy provide a good return on investment and therefore aims to help its customers improve their environmental impacts through its products and services. A recent example of this was the launch of the £50 million RBS fund for wind turbines and solar photovoltaic which enables the agriculture sector and small business to overcome the barriers of upfront costs of renewable projects. RBS has over 20 years' experience of providing finance for large-scale renewable projects, and were recently awarded the Environmental Finance Award for Solar deal of the year for the Topaz Solar Farm bond financing.

The Royal Bank of Scotland is one of the world's largest banks by asset value and market capitalisation. From its headquarters in Edinburgh, the group serves over 30m customers in the UK, Europe, the Middle East, the Americas and Asia.

5.4. Companies must become more innovative to differentiate their renewable energy strategies

It is clear that more and more companies are now exploiting the voluntary procurement of renewable energy as a means of branding. As consumers become more aware of sustainability issues and their nuances, companies wishing to be identified as sustainability leaders must do more and be more innovative in their approach, in order to differentiate from the competition.

For example, in the future, it may no longer be enough to take a low-effort approach to purchasing certificates. Some companies may choose to only purchase certificates that have been verified to exacting standards. Other companies, such as BSkyB, may choose to increase their level of commitment by investing in onsite generation (see box "Renewable energy with wood chips and wind turbines" p31). It will be interesting to see how the voluntary renewable energy market evolves, through future editions of the CREX report.

Rapid ramp-up of renewable energy procurement

US insurance and wealth management company The Hartford dramatically increased its renewable energy procurement in 2011. While the company has been successfully reducing its carbon footprint over the last few years, renewables procurement has only recently taken on a prominent role, but is supported by the company's employees. Renewable energy procurement allows The Hartford to maintain a lead in corporate responsibility over its peers in the industry. The company has coupled its renewable energy procurement with other strategic activities aimed at capitalising on the clean energy sector's growth.

In 2010, The Hartford obtained 0.1% of its electricity from renewables. A year later, it had increased this to 6.0% (10GWh out of 168GWh), a 60-fold jump. Nearly all of this is sourced through the purchase of Green-E certified RECs, obtained from third-party vendors such as Sterling Planet. On-site generation has also played a role, albeit a comparatively minor one: a 200kW rooftop PV system was installed at the headquarters in Windsor, Connecticut in 2009. The company retires the RECs created from the system rather than selling them into a compliance market.

The company's goal of achieving a 15% reduction in greenhouse gas emissions relative to 2007 levels by 2017 was met in 2010, thanks to a combination of energy efficiency initiatives and also by encouraging behavioural changes such as remote working. Since meeting the target, the Hartford has established a more aggressive target, for a 20% reduction by 2017 from 2010 levels.

Beyond these corporate sustainability efforts, the company has also recognised the clean energy sector as a growth opportunity for its business. Leveraging its 20-year history insuring windfarms, in 2010 it formed an insurance practice dedicated to renewable energy, looking to provide coverage for the solar, wind, biomass, and fuel cell industries. The company has begun a programme to offer discounts on insurance to owners of electric vehicles (EVs). In addition, the venture capital division, Hartford Ventures, is a shareholder in Coulomb Technologies, an EV infrastructure installer.

The Hartford Financial Services Group Inc. (NYSE: HIG) is a leading provider of insurance and wealth management services for millions of consumers and businesses worldwide. It has received numerous awards in recognition of its environmental commitment including 12th greenest company in America (Newsweek, 2011), Carbon Disclosure Leadership Index for four consecutive years (CDP, 2008-11), Green Power Partnership Top Partner rankings (EPA, 2012), and World's Most Ethical Companies for five consecutive years (The Ethisphere Institute, 2008-12).

Appendices

Appendix A. Ranking methodology

Data collection approach

The CREX is based on primary research through an online survey. The 2011 survey was conducted by a team of Bloomberg New Energy Finance analysts spread across four continents who contacted the companies by email and telephone. Of the 1776 companies contacted for 2011 results, 175 companies responded with sufficient data. The survey data was then supplemented with data from other sources in order to include additional companies:

1. Data obtained from third-party sources: the Carbon Disclosure Project (CDP) and the US Environmental Protection Agency (EPA) Green Power Partnership shared their data with us for this report.
2. Bloomberg Terminal ESG data: Bloomberg collects public data on companies' environmental, social and governance (ESG) performance and makes it available via the Terminal service.
3. Asset finance data from Bloomberg New Energy Finance's Industry Intelligence database: this is the most robust repository of renewable energy projects and their financing structures.
4. Efforts were made to verify the quality and consistency of the survey responses but it remains possible that some respondents provided incorrect data. Bloomberg New Energy Finance made no estimates in the process of compiling this report; all data here is based on information provided by companies or found in one of the well-respected third-party databases described above. Table 10 shows the response rate to the three iterations of the survey.

Table 10: Survey response results

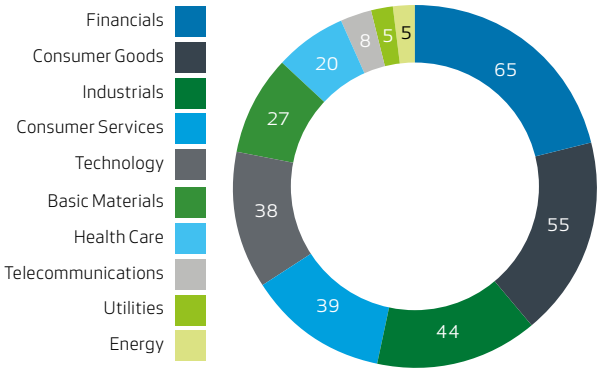
	2009 data	2010 data	2011 data
Total companies surveyed	1019	992	1776
Companies responding to Bloomberg New Energy Finance survey with sufficient data	78	63	175
Companies whose relevant data was obtained via the CDP	38	24	50
Companies whose relevant data was obtained via the US EPA	12	14	74
Companies whose relevant data was obtained via the Japan National Energy Company	24	n/a	n/a
Companies whose relevant data was obtained from their CSR reports	n/a	n/a	7
Total number of relevant and sufficient responses	152	101	306

Source: Bloomberg New Energy Finance.

Renewable energy ranking

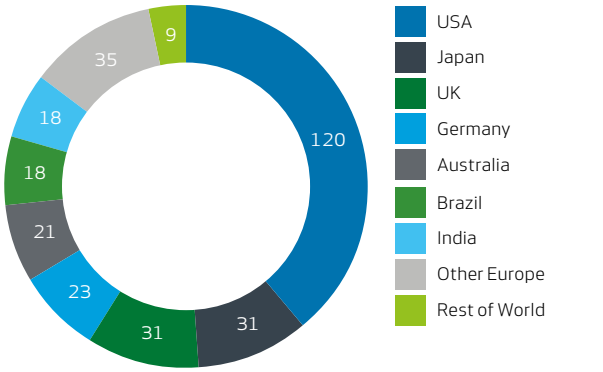
We assumed that the environmental attributes of all renewable electricity technologies and procurement methods were equal. For the purpose of ranking companies' procurement levels, the overall CREX is based on the percentage of total electricity consumption from renewable sources.

Figure 18: CREX participants by sector, 2011



Source: Bloomberg New Energy Finance.

Figure 19: CREX participants by country, 2011



Source: Bloomberg New Energy Finance.

Number of responses

Figure 18 shows the split of 2011 survey responses by sector, while Figure 19 shows the same set split by country. The 2010 CREX included 102 companies, of which 50% came from the US. This year, the index is much more globally representative with 306 participants spread over five continents.

Appendix B. Data sources

Bloomberg survey research
(http://corporate-sustainability.questionpro.com)

The majority of data was collected via an online survey designed for corporate reporting of total energy use, electricity consumption and renewable electricity procurement, disaggregated by technology and procurement method. Bloomberg New Energy Finance requested that companies report data on global operations according to organisational boundaries defined by the World Resources Institute protocol for company reporting of greenhouse gas emissions[10].

Bloomberg Terminal
(http://www.bloomberg.com/professional)

We accessed company-specific data on total energy use and electricity consumption via the Bloomberg terminal in order both to verify the accuracy of the survey data and to complement data obtained through third-party sources. The data largely come from companies' own reports.

Bloomberg New Energy Finance Industry Intelligence

Bloomberg New Energy Finance's proprietary database 'Industry Intelligence' tracks all investment activity in renewable energy across the globe. It covers over 32,500 organisations (including start-ups, corporates, venture capital and private equity providers, banks and other investors), 21,500 projects and 17,000 transactions. For each project it contains all relevant parameters including capacity, location, technology, owners, investors and commissioning dates.

Carbon Disclosure Project
(https://www.cdproject.net/en-US/Pages/HomePage.aspx)

The Carbon Disclosure Project (CDP) is a non-profit organisation that collects GHG emissions data from thousands of organisations across the world. We obtained company-specific data used in the ranking, directly from the CDP in order both to verify the accuracy of the survey data and to use as a data source for companies that did not complete the survey.

US Environmental Protection Agency
(http://www.epa.gov/greenpower)

The EPA's Green Power Partnership programme encourages companies to enhance their procurement of renewable electricity. The EPA supports partner companies by providing "expert advice, technical support, tools and resources." Bloomberg New Energy Finance obtained company-specific data directly from the EPA green power database in order both to verify the accuracy of the survey data and to use as an additional data source.

10. http://pdf.wri.org/ghg_protocol_2004_chp003.pdf

Appendix C. Definitions

The survey included definitions for specific terminology used in each question to ensure consistent reporting among respondents, including:

- **Company =** all global operations within the defined GHG-reporting boundaries of the organisation. Companies with subsidiaries, joint ventures, etc. can set these boundaries via Equity Share, Financial Control or Operational Control methods
- **Industry, sector =** ICB system top-level industry designation (via the Bloomberg Terminal)
- **Total energy consumption =** global annual direct fuel and electricity consumption in MWh/year resulting from the operations of the company
- **Total electricity consumption =** global annual electricity consumption resulting from all operations within the defined boundaries of a given organisation
- **Total renewable electricity procurement =** total number of MWh of electricity or proxy purchased globally from renewable energy power-generating projects directly or indirectly. The procurement does not include renewable energy generated as part of electricity obtained through the grid unless it is specifically bundled with renewable attributes.
  Counted procurement methods included:
  - » Purchases of renewable energy certificate (RECs/ROCs/green certificates) via an official registry
  - » Participation in voluntary green pricing programmes under which customers pay a premium for renewable power (mainly found in the US)
  - » On-site or direct investment in renewable electricity generation, of which the environmental attributes are not sold to any other party outside the company (eg, on-site solar panels)

  Note that we also collected data on purchases of carbon offsets (e.g. Voluntary Carbon Standard, CDM, Gold Standard) procured from renewable energy projects and converted into MWh of green electricity. These must have been purchased and retired via an official registry. In previous CREX reports these were counted as renewable energy, but this year carbon offsets are specifically excluded from the analysis and rankings for the reasons given in Section 2.2.
- We defined the following renewable electricity categories:
  - » Biomass = woody waste; agricultural crops or waste; animal and other organic waste; energy crops; co-firing of biomass in fossil fuel generation plants.
  - » Biofuel = biofuels such as bioethanol and biodiesel.
  - » Geothermal = all electricity from geothermal facilities.
  - » Solar = all electricity produced solar photovoltaics (PV) and solar thermal facilities.
  - » Wind = all electricity from wind turbines.
  - » Hydro = hydro projects from new generation capacity.
  - » Waste-to-energy = electricity using landfill gas or waste from other facilities such as wastewater treatment stations.
  - » Blend = renewable electricity consisting of a mix of renewables as provided by for example third-party marketers.

Appendix D. Company list (alphabetical) – 2011 data

Note that renewable energy consumption is given to the nearest MWh, where known. Procurement of less than 0.5MWh renewable energy is therefore rounded down to zero.

Table 11: CREX 2011 participants

Name in report	Sector	Country	2011 Electricity usage /MWh	2011 Renewables usage /MWh	% Renewables excluding offsets	Global CREX rank	Source technology (% of RE procurement)							
							Biomass /Biofuel	Geo-thermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
101 Collins Street Pty Ltd	Financials	Australia	7,717	0	0	276	0	0	0	100	0	0	0	0
ACC	Industrials	India	2,456,100	19,445	1	242								
Acciona	Industrials	Spain	595,018	257,000	43	93	0	0	0	0	0	0	100	0
ACT Government	Industrials	Australia	159,564	36,017	23	132								
Adidas	Consumer Goods	Germany	212,154	-	-	280								
Admiral Group	Financials	UK	11,179	5,146	46	87								
Adobe Systems	Technology	USA	62,000	62,000	100	1	18	0	0	82	0	0	0	0
Advance Micro Devices	Technology	USA	362,000	73,534	20	140	0	0	0	100	0	0	0	0
Adventist Health	Health Care	USA	58,274	6,763	12	170	0	0	0	0	0	0	100	0
Aeroports de Paris	Industrials	France	316,453	-	-	280								
Aflac	Financials	USA	35	-	-	280								
Agilent Technologies	Industrials	USA	206,000	-	-	280	0	0	100	0	0	0	0	0
AGL Energy Ltd	Utilities	Australia	191,000	5,000	3	230								
Ahold USA	Consumer Services	USA	2,045,000	149,854	7	199	0	0	1	0	0	0	99	0
Akamai Technologies Inc	Technology	USA	198,626	-	-	280								
Alcoa	Basic Materials	USA	272,242,310	1,529,293	1	245								
Alcoa Alumínio SA	Basic Materials	Brazil	6,026,108	3,452,059	57	67	0	0	0	0	100	0	0	0
Alfresa Holdings Corp	Health Care	Japan	331,373	192	0	264								
Allianz	Financials	Germany	574,097	273,138	48	84	0	0	6	2	92	0	0	0
Altana	Basic Materials	Germany	127,453	63,727	50	78								
Aluminum Shapes	Industrials	USA	28,942	15,430	53	75	52	0	48	0	0	0	0	0
AMEC	Energy	UK	44,770	5,430	12	165								
Amway Corp	Consumer Goods	USA	118,028	8,667	7	198	0	0	0	100	0	0	0	0
AngioDynamics	Health Care	USA	388	388	100	1	0	0	50	50	0	0	0	0
Anglo American	Basic Materials	UK	28,583,334	530,556	2	234								
Anheuser-Busch InBev NV	Consumer Goods	Belgium	13,222,222	925,556	7	202								

Name in report	Sector	Country	2011 Electricity usage /MWh	2011 Renewables usage /MWh	% Renewables excluding offsets	Global CREX rank	Source technology (% of RE procurement)							
							Biomass /Biofuel	Geo-thermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
Aon Limited	Financials	UK	23,317	-	-	280								
Apollo Tyres	Consumer Goods	India	275,240	25,860	9	189	0	0	0	100	0	0	0	0
Apple Inc	Technology	USA	580,921	54,000	9	190								
Appleton Coated	Basic Materials	USA	258,200	46,425	18	145	0	0	0	100	0	0	0	0
Applied Materials	Technology	USA	288,828	36,620	13	163	0	0	14	86	0	0	0	0
Ardent Leisure Limited	Financials	Australia	53,596	-	-	280								
Arup	Industrials	UK	24,947	-	-	280								
Asahi Kasei Corp.	Basic Materials	Japan	2,900,000	261,000	9	192	0	0	0	0	100	0	0	0
Asics	Consumer Goods	Japan	23,421	231	1	238	0	0	0	0	0	0	100	0
Associated British Foods	Consumer Goods	UK	1,574,666	1,574,666	100	1	99	0	0	0	0	1	0	0
AstraZeneca	Health Care	UK	873,418	5,259	1	244	0	0	100	0	0	0	0	0
Atlas Copco	Industrials	Sweden	305,000	93,200	31	112	0	0	0	0	77	0	23	0
Audi	Consumer Goods	Germany	545,000	171,930	32	108								
Autodesk	Technology	USA	45,420	4,890	11	172								
AUTOMETAL S.A.	Industrials	Brazil	15,881	15,881	100	1								
Aviat Networks	Technology	USA	1,504	1,504	100	1	0	0	5	95	0	0	0	0
Aviva	Financials	UK	185,852	185,852	91	42	0	0	0	1	0	0	99	0
Azbil Corp	Industrials	Japan	40,198	23	0	265								
Banca Monte dei Paschi di Siena	Financials	Italy	206,874	200,494	97	37	0	0	0	0	0	0	0	100
Banco Popular	Financials	Spain	111,673	86,970	78	52								
Bank of America	Financials	USA	3,140,365	158,881	5	208	2	0	0	0	1	0	97	0
Bank of Montreal	Financials	Canada	407,612	115,213	28	120	0	0	0	92	8	0	0	0
Baxter International Inc.	Health Care	USA	982,000	156,400	16	152	0	0	2	33	0	0	65	0
BBC Consulting Planners	Financials	Australia	18	18	100	1	0	0	0	100	0	0	0	0
Becton, Dickinson and Company	Health Care	USA	906,568	262,541	29	118	0	0	0	85	0	0	15	0
Berkeley Group Holdings	Consumer Goods	UK	10,940	766	7	201								
Best Buy	Consumer Services	USA	1,123,497	118,865	11	174	87	0	0	13	0	0	0	0
Big Yellow	Financials	UK	13,925	107	1	243								
Biogen Idec	Health Care	USA	94,264	4,014	4	215	0	0	0	0	0	0	100	0
Bloomberg LP	Consumer Services	USA	249,374	211,967	85	45	21	0	0	61	0	18	0	0
BMW	Consumer Goods	Germany	1,702,157	328,912	19	143	0	0	0	0	0	100	0	0
BNY Mellon	Financials	USA	401,571	227,347	57	68	0	0	0	100	0	0	0	0
Boehringer Ingelheim	Health Care	Germany	1,780,000	294,000	17	150								

Name in report	Sector	Country	2011 Electricity usage /MWh	2011 Renewables usage /MWh	% Renewables excluding offsets	Global CREX rank	Source technology (% of RE procurement)							
							Biomass /Biofuel	Geo-thermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
Boots UK	Consumer Services	UK	318,000	200,000	63	62	0	0	0	0	0	0	0	100
Boral Ltd	Industrials	Australia	680,708	-	-	280								
Brasil Foods	Consumer Goods	Brazil	2,070,562	445,648	22	136								
Brickworks	Industrials	Australia	121,000	-	-	280								
British Land	Financials	UK	98,746	74,266	75	53	0	79	19	2	0	0	0	0
BskyB	Consumer Services	UK	168,997	168,997	83	47	0	0	0	100	0	0	0	0
BT Group	Telecom-munications	UK	2,210,000	928,200	42	96								
Bunge Brasil	Basic Materials	Brazil	699,246	306,163	44	89	100	0	0	0	0	0	0	0
CA Technologies	Technology	USA	108,748	15,964	15	156	0	0	0	95	0	0	5	0
Cabcharge Australia Limited	Financials	Australia	540	-	-	280								
Cantex	Industrials	USA	23,937	2,394	10	179	0	0	0	100	0	0	0	0
Capital One Financial Corporation	Financials	USA	358,220	34,799	10	186	0	0	0	0	0	0	100	0
Centrotec	Energy	Germany	20,400	5,400	24	128	0	0	20	10	30	40	0	0
Chandan Steels	Basic Materials	India	36,280	8,437	23	130	0	0	0	100	0	0	0	0
Chelsea Piers	Consumer Services	USA	22,073	22,073	100	1	0	0	0	100	0	0	0	0
China Shenhua Energy Co Ltd	Basic Materials	China	243,828,674	28,460	0	271								
Cisco	Technology	USA	1,629,000	358,000	22	135								
Citigroup	Financials	USA	2,062,790	234,080	11	171	14	0	14	41	30	0	0	0
City Developments	Financials	Singapore	66,230	3,327	0	252	94	0	6	0	0	0	0	0
Co Serve	Technology	Australia	22	6	26	124								
Coating Excellence	Industrials	USA	32,000	2,409	8	197	0	0	0	100	0	0	0	0
Cobham	Industrials	UK	126,745	22,163	17	147								
Coloplast	Health Care	Denmark	137,726	-	-	280								
Cosmo Oil Co Ltd	Energy	Japan	31,275,148	149	0	278								
Daito Trust Construction Co Lt	Industrials	Japan	263,729	-	-	280								
Datapipe Inc	Technology	USA	55,880	55,880	100	1	0	0	0	100	0	0	0	0
Delhaize Group	Consumer Services	Belgium	3,313,490	237,087	7	200	0	0	1	0	98	0	0	0
Dell Inc.	Technology	USA	812,400	140,800	17	149								
Deluxe Corp	Financials	USA	56,740	37,700	66	60	0	0	0	100	0	0	0	0
Denki Kagaku Kogyo KK	Basic Materials	Japan	6,686,400	1,028,200	15	154								
Deutsche Bank	Financials	Germany	540,000	394,000	73	56	0	0	0	29	40	0	31	0
Deutsche Post DHL	Industrials	Germany	1,837,000	719,000	39	99								
Deutsche Telekom	Telecom-munications	Germany	6,409,439	3,088,811	48	82	1	0	0	1	98	0	0	0
Deutsche Wohnen	Financials	Germany	9,111	9,111	100	1	0	0	0	0	100	0	0	0

Name in report	Sector	Country	2011 Electricity usage /MWh	2011 Renewables usage /MWh	% Renewables excluding offsets	Global CREX rank	Source technology (% of RE procurement)							
							Biomass /Biofuel	Geo-thermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
DEXUS Property Group	Financials	Australia	142,245	13,000	9	191	5	0	0	95	0	0	0	0
Diageo	Consumer Goods	UK	452,228	205,639	45	88								
DSV	Industrials	Denmark	129,364	3,710	3	227	0	0	0	0	100	0	0	0
DTE Energy	Utilities	USA	8,028,000	-	-	280	8	0	3	6	10	20	0	54
Duerr	Industrials	Germany	28,833	-	-	280								
Duratex	Industrials	Brazil	2,272,916	1,799,784	79	50	100	0	0	0	0	0	0	0
Earthcolor	Technology	USA	27,783	27,783	100	1	0	0	0	100	0	0	0	0
Ecorodovias	Consumer Goods	Brazil	20,262	18,784	93	41								
Eisai Co Ltd	Health Care	Japan	462,549	962	0	255								
ElringKlinger	Consumer Goods	Germany	119,600	12,570	11	175	0	0	0	0	0	0	100	0
EMC Corporation	Technology	USA	839,608	65,000	8	196	0	0	0	30	70	0	0	0
Empire State Building Association	Financials	USA	54,540	54,540	100	1	0	0	0	100	0	0	0	0
Ernst & Young LLP	Financials	USA	92,893	38,975	42	97	0	0	0	100	0	0	0	0
Ernst & Young UK	Financials	UK	26,144	26,144	100	1								
Essilor Intl.	Health Care	France	436,400	-	-	280								
Faber Castell	Consumer Goods	Brazil	28,727	28,727	100	1								
FedEx	Industrials	USA	1,689,176	33,000	2	232	0	0	0	0	0	0	0	100
FIAT SpA	Consumer Goods	Italy	5,898,872	1,309,717	22	134	0	0	0	0	95	0	5	0
Fíbria	Basic Materials	Brazil	3,060,349	2,890,066	94	39								
Fifth Third Bank	Financials	USA	200,000	60,000	30	115	0	0	0	100	0	0	0	0
Foulger-Pratt	Financials	USA	47,017	34,588	74	54	0	0	0	100	0	0	0	0
Fraport	Industrials	Germany	331,444	79,547	24	126	0	0	0	0	0	0	100	0
Freescale Semico	Technology	USA	400,442	12,996	3	218	4	0	0	96	0	0	0	0
Gander Mountain	Consumer Goods	USA	95,000	33,250	35	102	0	0	0	100	0	0	0	0
Generali Group	Financials	Italy	154,429	76,101	49	80	0	0	0	0	100	0	0	0
Giant Eagle	Consumer Services	USA	659,308	20,000	3	223	0	0	0	100	0	0	0	0
GlaxoSmithKline	Health Care	UK	1,945,105	2,367	0	260	0	0	84	16	0	0	0	0
Google	Technology	USA	2,259,998	103,403	5	213	8	0	2	89	1	0	0	0
Green Mountain Coffee Roasters	Consumer Goods	USA	24,588	24,588	100	1	0	0	0	100	0	0	0	0
Grupo Pão de Açúcar	Consumer Services	Brazil	1,069,340	295,787	28	121	55	0	0	0	44	0	1	0
Hannover Re	Financials	Germany	8,214	-	-	280								
Hartford Fire	Financials	USA	164,620	10,188	6	204	0	0	2	98	0	0	0	0
HASSELL	Consumer Services	Australia	1,953	1,204	62	64	0	0	0	0	0	0	100	0
Haworth Inc	Consumer Goods	USA	92,266	24,000	26	123	0	0	0	100	0	0	0	0

Name in report	Sector	Country	2011 Electricity usage /MWh	2011 Renewables usage /MWh	% Renewables excluding offsets	Global CREX rank	Source technology (% of RE procurement)							
							Biomass /Biofuel	Geo-thermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
HEB Grocery	Consumer Services	USA	1,341,000	59,600	4	214	3	0	0	97	0	0	0	0
Henry Davis York	Financials	Australia	1,171	387	33	105	0	0	0	0	0	0	100	0
Herman Miller	Consumer Goods	USA	74,966	74,966	100	1	53	0	0	47	0	0	0	0
Hertz Corp	Consumer Services	USA	15,531	3,038	20	142	0	0	100	0	0	0	0	0
Hewlett-Packard	Technology	USA	4,122,000	442,000	11	173								
HHLA	Industrials	Germany	144,522	72,000	50	79	0	0	0	0	100	0	0	0
Hilton Worldwide	Consumer Services	USA	335,106	315,000	94	40	0	0	0	70	30	0	0	0
Hisamitsu Pharmaceutical Co In	Health Care	Japan	65,223	37	0	267								
Hitachi Ltd	Industrials	Japan	22,356,001	2,321	0	272								
HSBC	Financials	UK	1,476,000	1,476,000	10	179	0	0	0	100	0	0	0	0
Hyderabad Industries	Industrials	India	54,312	11,388	21	139	0	0	0	100	0	0	0	0
Ibiden Co Ltd	Industrials	Japan	1,785,362	173,151	10	187								
IBM	Technology	USA	5,073,000	518,000	10	177	31	0,1	0	20	49	0	0	0
Icade	Financials	France	260,000	13,000	5	210								
IKEA	Consumer Goods	Sweden	1,266,700	646,000	51	77								
Inditex SA	Consumer Services	Spain	897,222	28,588	3	219								
Industry Funds Management	Financials	Australia	328	328	100	1	0	0	0	100	0	0	0	0
Infosys	Technology	India	273,149	48,121	18	146	0	0	1	68	31	0	0	0
Ingalls Health System	Health Care	USA	28,200	1,410	5	210	0	0	0	100	0	0	0	0
Intel Corporation	Technology	USA	4,400,000	2,530,000	58	66	16	2	0	55	27	0	0	0
Interface	Consumer Goods	USA	35,343	35,343	100	1	0	0	1	99	0	0	0	0
Invensys	Technology	UK	158,757	537	0	251								
Itochu Corp.	Financials	Japan	10,516	98	1	240	0	0	100	0	0	0	0	0
Jackson Family Wines	Consumer Goods	USA	23,125	23,125	100	1	0	0	0	100	0	0	0	0
Japan Petroleum Exploration Co	Energy	Japan	871,500	8,188	1	239								
JBS	Consumer Goods	Brazil	732,968	354,756	48	81	31	0	0	0	0	0	69	0
Johnson Controls	Consumer Goods	USA	2,906,526	79,122	3	229	29	2	1	64	0	3	2	0
JPMorgan Chase	Financials	USA	2,114,362	215,000	10	178	0	0	0	100	0	0	0	0
Kay Power and Paper	Basic Materials	India	3,062	560	18	144	100	0	0	0	0	0	0	0
Kesko	Consumer Services	Finland	839,229	548	0	262	0	2	8	1	0	0	0	0
Kimberly-Clark	Consumer Goods	USA	22,344,000	5,350,800	24	127								

Name in report	Sector	Country	2011 Electricity usage /MWh	2011 Renewables usage /MWh	% Renewables excluding offsets	Global CREX rank	Source technology (% of RE procurement)							
							Biomass /Biofuel	Geothermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
Kingfisher	Consumer Services	UK	736,000	-	-	280								
Kirloskar Brothers	Industrials	India	25,556	9,451	37	100	0	0	0	100	0	0	0	0
Klabin	Industrials	Brazil	1,974,892	1,117,564	57	70	97	0	0	0	3	0	0	0
Kloeckner	Basic Materials	Germany	115,096	31,536	27	122								
Knoll	Consumer Goods	USA	38,257	5,000	13	162	0	0	0	100	0	0	0	0
Kohls	Consumer Services	USA	1,367,376	1,367,376	100	1								
Koninklijke KPN	Telecommunications	Netherlands	1,266	1,132	89	43	26	0	0	44	30	0	0	0
Kubota Corp	Industrials	Japan	2,361,111	37	0	277								
Langley Properties	Financials	USA	22,489	4,416	20	141	0	0	0	100	0	0	0	0
Larsen and Toubro	Industrials	India	262,359	31,483	12	168								
Lenovo	Technology	China	78,100	10,500	13	159	0	0	0	100	0	0	0	0
Lifeway Foods	Consumer Goods	USA	1,823	1,823	100	1	0	0	0	0	0	0	100	0
Linde	Basic Materials	Germany	20,300,000	40,000	0	257								
Lockheed Martin	Industrials	USA	1,836,389	546,399	30	117	2	0	0	16	34	0	47	0
Logica	Technology	UK	160,542	69,116	43	94	0	0	0	0	0	52	48	0
Los Angeles Convention Center	Consumer Services	USA	22,037	6,611	30	116	0	0	0	87	13	0	0	0
Lowe's	Consumer Services	USA	4,716,000	148,660	3	220	99	0	1	0	0	0	0	0
Marfrig Alimentos S.A.	Consumer Goods	Brazil	1,724,002	536,588	31	111	0	0	0	0	92	0	8	0
Marvell Technology Group Ltd	Technology	Bermuda	66,719	-	-	280								
McBride	Consumer Goods	UK	677,094	144,898	21	137	0	0	1	0	0	0	99	0
McCormick & Company Inc.	Consumer Goods	USA	111,239	3,063	3	228	0	0	100	0	0	0	0	0
McDonald's	Consumer Services	USA	1,008,000	306,000	30	114	0	0	0	100	0	0	0	0
Methanex Chile	Consumer Goods	Chile	51,346	5,985	12	169								
Methodist Medical Center of Illinois	Health Care	USA	38,216	3,757	10	185	0	0	0	100	0	0	0	0
MetLife, Inc.	Financials	USA	120,604	65,472	54	73	5	0	3	85	7	0	0	0
Microsoft	Technology	USA	2,427,255	1,120,000	46	86	25	0	0	50	25	0	0	0
Mitsubishi Heavy Industries Lt	Industrials	Japan	2,837,801	1,000	0	268								
Modern Times Group	Consumer Services	Sweden	13,723	-	-	280								
Mohawk Fine Pape	Basic Materials	USA	101,610	101,610	100	1	0	0	0	100	0	0	0	0
Motorola Mobility	Technology	USA	121,483	80,000	66	61	0	0	0	100	0	0	0	0
Motorola Solutions	Technology	USA	331,787	51,692	16	153	0	0	0	77	23	0	0	0
Multi Packaging	Industrials	USA	58,591	6,100	10	176	0	0	0	65	0	0	35	0

Name in report	Sector	Country	2011 Electricity usage /MWh	2011 Renewables usage /MWh	% Renewables excluding offsets	Global CREX rank	Source technology (% of RE procurement)							
							Biomass /Biofuel	Geo-thermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
Munich Re	Financials	Germany	293,036	83,350	28	119	0	0	0	0	0	0	100	0
National Australia Bank Ltd	Financials	Australia	210,081	210,081	8	194	31	0	0	35	27	7	0	0
Natl Envelope Co	Financials	USA	136,000	4,080	3	224	0	0	0	100	0	0	0	0
Neenah Paper	Basic Materials	USA	99,428	34,351	35	103	0	0	0	100	0	0	0	0
Neiman Marcus	Consumer Services	USA	44,971	4,450	10	184	0	0	0	100	0	0	0	0
Nestle SA	Consumer Goods	Switzerland	37,333,332	4,480,556	12	167								
NGK Spark Plug Co Ltd	Consumer Goods	Japan	654,506	210	0	269								
Nippon Sheet Glass Co Ltd	Industrials	Japan	15,155,556	286,000	2	233								
Nissan	Consumer Goods	Japan	5,310,000	14,800	0	254	0	0	5	61	0	0	34	0
Nokia Group	Technology	Finland	970,000	398,000	41	98	0	0	0	8	90	0	2	0
Northern Trust	Financials	USA	110,484	7,071	6	203	42	0	0	22	21	0	0	15
Novartis	Health Care	Switzerland	2,404,563	231,873	10	188	23	0	1	0	0	0	76	0
Novozymes	Health Care	Denmark	610,205	266,000	44	90	0	0	0	90	10	0	0	0
NTT	Telecom-munications	Japan	8,860,000	5,059	0	266	0	0	90	10	0	0	0	0
NYSE Euronext	Financials	USA	127,322	127,322	100	1	0	0	0	100	0	0	0	0
Odakyu Electric Railway Co Ltd	Consumer Services	Japan	1,355,903	2,714	0	256								
Oi SA	Telecom-munications	Brazil	1,440,120	214,468	15	155	0	0	0	0	84	16	0	0
OJI Paper Co Ltd	Basic Materials	Japan	37,033,199	20,498,400	55	71								
Omnicom Group	Consumer Services	USA	185,274	15,995	9	193	0	0	0	0	0	0	100	0
OneSteel	Basic Materials	Australia	2,006,872	-	-	280								
Orion	Health Care	Finland	69,537	43,110	62	63	0	0	0	5	84	0	0	11
Owens Corning	Industrials	USA	2,728,376	495	0	270	0	0	100	0	0	0	0	0
Park24	Consumer Services	Japan	64,976	-	-	280								
Pearson	Consumer Services	UK	142,250	142,250	100	1	0	0	0	0	0	0	100	0
PepsiCo, Inc.	Consumer Goods	USA	3,781,000	109,000	3	226	5	0	13	3	0	0	0	80
PerkinElmer	Industrials	USA	35,734	5,000	14	158	0	0	0	100	0	0	0	0
Pitney Bowes	Technology	USA	123,865	15,000	12	166	0	0	0	100	0	0	0	0
Powdr Corp	Consumer Services	USA	75,000	75,000	100	1	0	0	0	100	0	0	0	0
Praxair, Inc.	Basic Materials	USA	20,634,784	359,000	2	236	0	0	0	0	0	0	0	100
Prudential	Financials	UK	279,458	120,781	43	92								
Puma	Consumer Goods	Germany	57,617	7,544	13	161	0	0	6	0	71	0	0	24
Raiffeisen Bank	Financials	Austria	14,971	14,971	100	1	0	0	1	0	99	0	0	0

Name in report	Sector	Country	2011 Electricity usage /MWh	2011 Renewables usage /MWh	% Renewables excluding offsets	Global CREX rank	Source technology (% of RE procurement)							
							Biomass /Biofuel	Geothermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
Rajratan Global Wire	Basic Materials	India	18,210	2,672	15	157	0	0	0	100	0	0	0	0
Rautaruukki	Basic Materials	Finland	1,300,000	5,600	0	249								
Raytheon Company	Industrials	USA	853,247	35,907	4	217	40	0	0	60	0	0	0	0
RBS Group	Financials	UK	1,038,697	633,605	61	65								
Recreational Equipment	Consumer Goods	USA	64,790	10,471	16	151	25	0	21	29	0	0	24	0
Reed Elsevier	Consumer Services	UK	231,576	53,001	23	131	0	0	0	88	0	0	12	0
Republic of Everyone	Telecommunications	Australia	16	16	100	1	0	0	0	100	0	0	0	0
Ricoh Co Ltd	Technology	Japan	3,738,151	350	0	273								
Rooms To Go	Consumer Goods	USA	23,300	2,330	10	182	0	0	0	100	0	0	0	0
Royal Bank of Canada	Financials	Canada	757,625	13,663	2	235								
Ruchi Soya	Consumer Goods	India	188,354	24,803	13	160	0	0	0	100	0	0	0	0
SABMiller	Consumer Goods	UK	2,926,805	167,994	6	206								
Safeway	Consumer Services	USA	3,830,000	120,187	3	221	1	0	5	93	0	0	1	0
SAP	Technology	Germany	295,000	95,000	32	106	0	0	0	20	80	0	0	0
Sara Lee	Consumer Goods	USA	2,469,445	55,556	2	231								
SC Johnson & Son	Consumer Goods	USA	189,300	59,408	31	109	47	0	0	53	0	0	0	0
Scope International	Technology	India	15,600	7,500	48	83								
SEB	Financials	Sweden	91,759	65,856	72	57	5	0	0	5	90	0	0	0
Seiko Epson Corp	Technology	Japan	1,378,889	19,250	1	237								
Severn Trent	Utilities	UK	890,500	211,600	24	129	7	0	0	0	2	91	0	0
Sharp Corp.	Consumer Goods	Japan	3,419,052	13,095	0	250	0	0	36	15	0	0	0	50
Shinko Electric Industries Co	Technology	Japan	871,602	52	0	275								
SilexSolar	Industrials	Australia	4,639	5	0	261								
Sirius Overseas	Technology	India	17,348	17,348	100	1	100	0	0	0	0	0	0	0
Smiths Group	Industrials	UK	197,361	-	-	280								
Snam	Utilities	Italy	112,285	37,716	34	104	0	0	0	0	0	0	100	0
Softlayer Techno	Technology	USA	100,730	10,073	10	181	0	0	0	100	0	0	0	0
Sony (US)	Consumer Goods	Japan	243,178	88,271	36	101	0	0	0	94	0	0	6	0
Sony Corp	Consumer Goods	Japan	8,222,222	347,180	4	216								
Spansion	Technology	USA	259,696	12,000	5	212	4	0	0	96	0	0	0	0
Spotless Group	Financials	Australia	56,708	5	0	274								
Sprint	Telecommunications	USA	3,514,685	176,005	5	209	0	0	1	71	0	0	28	0

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							Biomass /Biofuel	Geo-thermal	Solar	Wind	Hydro	Waste to energy	Blend	Unknown
Standard Bank	Financials	South Africa	152,561	266	0	258	0	0	100	0	0	0	0	0
Staples	Consumer Services	USA	662,293	516,713	78	51	0	0	0	100	0	0	0	0
Starbucks	Consumer Services	USA	900,124	421,535	47	85	0	0	0	100	0	0	0	0
State Street Corporation	Financials	USA	251,960	175,406	54	74	45	0	0	36	19	0	0	0
Steelcase USA	Consumer Goods	USA	128,078	31,928	25	125	0	0	0	100	0	0	0	0
Sto	Industrials	Germany	12,978,277	11,031,535	85	44								
Stockland	Financials	Australia	140,735	-	-	280								
Sumitomo Mitsui Financial Group	Financials	Japan	191,057	16,569	1	246	0	0	6	0	0	0	94	0
Sundance Square Management	Financials	USA	63,056	6,305	10	183	0	0	0	0	0	0	100	0
Swisscom AG	Telecom-munications	Switzerland	507,000	411,000	81	49								
Tabcorp	Consumer Services	Australia	144,782	-	-	280								
Taisho Pharma-ceutical Co Ltd	Health Care	Japan	341,667	-	-	280								
Taj GVK Hotels	Consumer Services	India	5,356	2,950	55	72								
Tata Chemicals	Basic Materials	India	658,082	920	0	259	0	0	0	100	0	0	0	0
Tesco	Consumer Services	UK	6,181,577	-	-	280								
The Breakers Palm Beach, Inc.	Financials	USA	30,493	13,000	43	95	0	0	0	100	0	0	0	0
The Clorox Company	Consumer Goods	USA	768,969	17,119	1	241								
The Coca-Cola Company	Consumer Goods	USA	6,761,294	206,350	3	222	0	0	0	10	0	0	0	90
The Dixie Group's Masland Contract	Consumer Goods	USA	21,219	14,777	70	58	0	0	0	100	0	0	0	0
The Hartford	Financials	USA	167,792	10,191	6	205	0	0	2	0	0	0	98	0
The Phillies	Consumer Services	USA	22,323	22,323	100	1	0	0	0	100	0	0	0	0
The Tower Co	Utilities	USA	46,000	46,000	100	1	0	0	0	100	0	0	0	0
The Wrapping Paper Company Pty Ltd	Consumer Goods	Australia	85	85	100	1	0	0	0	0	0	0	100	0
Timberland	Consumer Goods	USA	46,544	2,456	5	207	1	11	1	54	22	0	11	0
Tokio Marine Holdings	Financials	Japan	133,412	4,000	3	225	75	0	0	25	0	0	0	0
Toronto Dominion Bank	Financials	Canada	261,826	261,826	100	1	0	0	0	100	0	0	0	0
Ubi Banca	Financials	Italy	125,477	125,477	100	1	0	0	0	0	100	0	0	0
UBS	Financials	Switzerland	631,061	274,000	43	91	0	0	0	9	70	0	21	0
UCB	Health Care	Belgium	143,534	44,763	31	110								

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United Natural Foods	Consumer Services	USA	69,362	21,106	30	113	0	0	11	70	0	0	18	0
UPM-Kymmene OYJ	Basic Materials	Finland	15,900,000	9,000,000	57	69								
UPS	Industrials	USA	47,140,999	199	0	279								
Usaa - United Sv	Financials	USA	148,203	33,277	22	133	1	1	0	98	0	0	0	0
USANA Health Sciences	Consumer Goods	USA	6,802	6,802	100	1	0	0	3	97	0	0	0	0
USIMINAS	Basic Materials	Brazil	3,600,100	769,402	21	138	0	0	0	0	0	90	10	0
V & M do BRASIL	Basic Materials	Brazil	312,672	99,061	32	107								
Vale SA	Basic Materials	Brazil	14,524,266	7,485,980	52	76	0	0	0	0	48	0	52	0
Vestas Wind Systems	Energy	Denmark	305,485	207,534	68	59	0	0	0	45	0	0	0	55
Vinci SA	Industrials	France	1,000,670	4,385	0	248								
Vivendi	Consumer Services	France	1,067,000	4,800	0	247								
Volkswagen	Consumer Goods	Germany	16,240,000	47,000	0	253								
Volkswagen do Brasil	Consumer Goods	Brazil	518,977	429,219	83	48								
Washington Real Estate Investment Trust	Financials	USA	146,090	146,090	100	1	0	0	0	100	0	0	0	0
WEG	Industrials	Brazil	386,069	369,503	96	38	0	0	0	0	100	0	0	0
Wells Fargo	Financials	USA	2,677,118	1,609	0	263	0	0	0	0	0	0	100	0
Whole Foods Market	Consumer Services	USA	745,000	745,000	100	1								
Wipro	Technology	India	317,695	55,274	17	148	0	0	0	44	56	0	0	0
Xanterra Parks	Consumer Services	USA	66,700	8,275	12	164	0	0	29	25	0	0	45	0
Xerox Corporation	Technology	USA	456,579	35,426	8	195	0	0	0	100	0	0	0	0
Yash Papers	Basic Materials	India	38,902	38,902	100	1								
Zenith Silk Mills	Industrials	India	2,551	2,132	84	46	0	0	0	100	0	0	0	0
ZF Steering Gear	Consumer Goods	India	8,919	6,511	73	55	0	0	0	100	0	0	0	0

About Us

Bloomberg New Energy Finance

Subscriptions:
sales.bnef@bloomberg.net

Guy Turner Head of Commodities	gturner10@bloomberg.net +44 20 3216 4086
Isobel Rea Manager, Consulting	irea@bloomberg.net +44 20 3525 8538
Sam Roots Analyst, Consulting	sroots@bloomberg.net +44 3525 8438

This report would not have been possible without a global team of BNEF Analysts and Managers who were responsible for the survey data. Key contributors include Ingo Steinhaeuser, Ashish Sethia, Shantanu Jaiswal, Gabriela da Rocha Oliveira, Yayoi Sekine, Lilian Clea Alves, Seb Henbest, Kobad Bhavnagri, and Michel Dicapua.

Vestas

www.energytransparency.com
http://www.vestas.com/energytransparency

Morten Kamp Jørgensen Director, Brand Management, Global Marketing, Communication & Corporate Relations	mokjo@vestas.com +45 2237 1433
Jonas N. Johannesson Business Consultant, Brand Management, Global Marketing, Communication & Corporate Relations	jnjoh@vestas.com +45 4081 5319
Anders Peter Riis Marketing Consultant, Brand Management, Global Marketing, Communication & Corporate Relations	anprr@vestas.com +45 4181 3922

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