

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

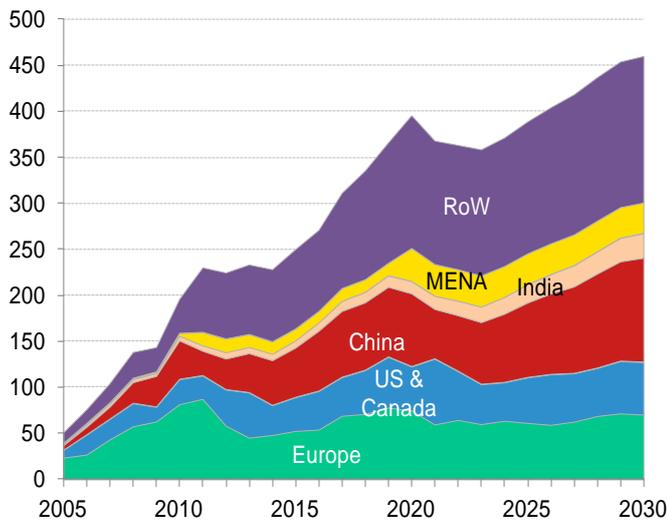
## SECTION 1. GLOBAL RENEWABLE ENERGY MARKET PROJECTIONS

Global investment in renewable energy has grown rapidly in recent years, driven by concerns about climate change, the increasing cost of fossil fuels and national economic policies to create green jobs. Looking forward, global investment in renewable energy projects (excluding hydro) will rise from \$195bn in 2010 to \$395bn in 2020 and to \$460bn by 2030, according to Bloomberg New Energy Finance analysis.<sup>1</sup> Over the next 20 years this growth will require nearly \$7 trillion of new capital.

Over this period renewable sources, including hydro, will increase their share of total primary energy production from 12.6% in 2010 to 15.7% in 2030. The share of non-hydro renewable resources will increase from 10.3% to 13.2% over the same period.

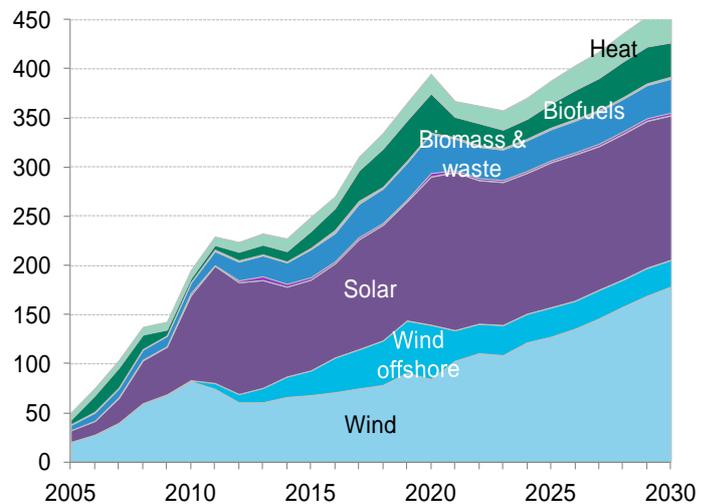
The next 10 years will see a steep climb in investment as countries rush to meet their 2020 renewables targets. In addition, much of the spend in 2018-20 will be in the more costly offshore wind projects, in particular in Germany and the UK. Expenditure on renewable energy projects is likely to dip temporarily in the early 2020s as countries review their longer-term objectives, and digest the effects of the rapid expansion in renewables over the previous years.

**Figure 1: Annual investment in renewable energy capacity, 2005-30 by region (\$bn)**



Source: Bloomberg New Energy Finance

**Figure 2: Annual investment in renewable energy capacity, 2005-30 by technology sector (\$bn)**



Source: Bloomberg New Energy Finance

1 The figures presented herein differ somewhat from previous Bloomberg New Energy Finance annual investment figures. This is because those used for this report represent money spent on renewable energy assets – calculated as annual build capacity multiplied by country-specific capital cost of technology – while previous investment figures refer to money raised for renewable energy projects. The

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

---

difference arises because in most major renewable energy markets, there is a lag of some 2-3 years between when money is raised and when project begins operations.

## Regional outlook

Geographically Europe will remain the largest regional market for renewables up to 2014, with 25% of world investment, but will experience a contraction over this period as governments review the value of clean energy support mechanisms in the face of severe sovereign debt problems. Growth in the European market will resume post 2015 at an annual growth rate of 8% as investment is scaled up to achieve the European renewable energy target by 2020.

The economic challenges in Europe will be felt less in the rest of the world. In China investment in renewable energy is expected to continue to increase in all years, and by 2014 China will become the largest single market for renewable energy with an annual spend of just under \$50bn, accounting for 21% of the world market. The US and Canada are also expected to see no lasting slowdown in project build, together hitting \$50bn of investment by 2020.

By far the most rapid growth will be seen in the rapidly developing economies of India, the Middle East and North Africa (MENA), Africa and Latin America, which are projected to experience growth rates of 10-18% per year between 2010 and 2020. By 2020 the markets outside of the EU, US, Canada and China will account for 50% of world investment.

## Technology outlook

After 2020 more ambitious energy policies coupled with much lower unit costs of renewable technologies will drive further deployment of renewable energy technologies. Although in the 10 years to 2030, world investment in renewables will rise by a more modest 2.5% per year, this masks a very significant increase in development as the cost of technologies declines.

The benefits of cost reductions over time will mostly affect the solar sector, where unit costs are expected to fall by 60% over the next 20 years. This will spur deployment of solar technologies around the world, but it will also mean less capital is required to produce the same output. Annual investment in solar power assets will go from \$86bn in 2010 to \$150bn in 2020 and then remain constant at \$150bn a year between 2020 and 2030.

The wind sector will broadly match solar and grow from \$71bn in 2010 to \$140bn in 2020 and \$82bn in 2030. The bioenergy sector will see renewed activity with the commercialisation of second-generation technologies and global supply chains developing in the movement of biomass fuels. Investment in biofuels, biomass and waste-to-energy is projected to increase from \$14bn in 2010 to \$80bn in 2020 and then remain level in the following decade.

## Power generation

Our base case forecasts that net power production will increase by nearly 90% over the next 20 years, to 34,000TWh worldwide. Although electricity intensity has declined over the last 20 years and will continue to come down, there is a clear correlation between economic growth and electricity demand. The share of clean electricity (renewables, including hydro, and fossil-fuel plants with carbon capture and storage) is projected to rise from 23% in 2010 to 29% in 2020, reaching 34% in 2030.

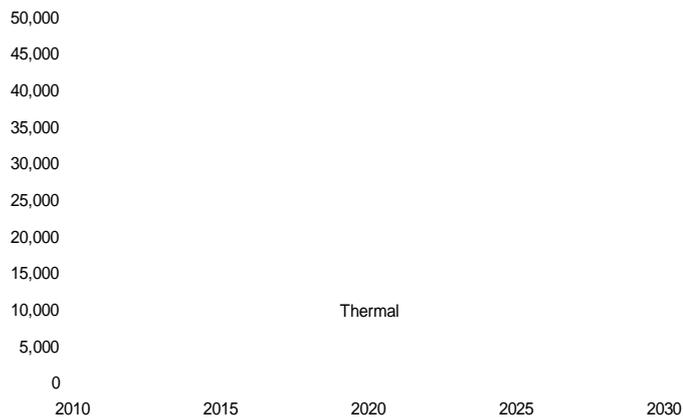
Within the renewable sector, the share of hydro power is expected to decline from some 19% in 2010 to 15% by 2020. Because of the overall increase in power production, hydro output will still increase in absolute terms by 2% a year. The aggregate share of other renewable technologies, such as wind, solar and geothermal, and CCS, will grow from 5% in 2010 to 19% in 2030, corresponding to a 10% compound annual growth rate.

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

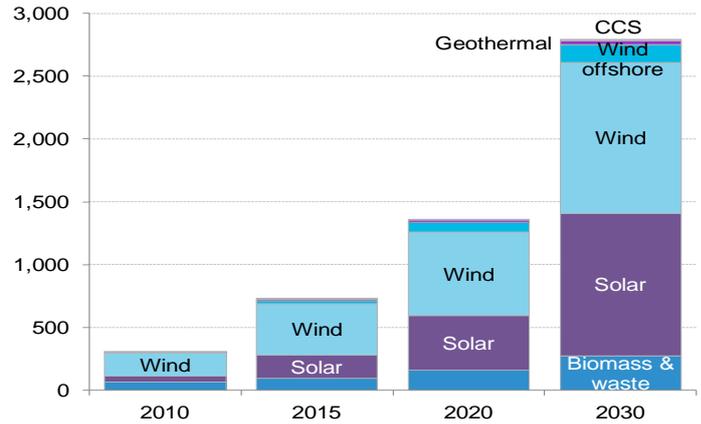
Reflecting the rising production and investment levels, installed capacity of renewable power sources is also projected to climb, adding 2.5TW by 2030 – growth of over 800%. We therefore expect around 1.1TW of new build this decade, with 36% from solar and 46% onshore wind, followed by 1.4TW between 2021 and 2030, of which half will be new solar installations and 37% onshore wind.

**Figure 3: Net power generation by source, 2010-30 (TWh)**



Source: EIA, IMF, Bloomberg New Energy Finance

**Figure 4: Total installed capacity by technology (GW)**



Source: Bloomberg New Energy Finance

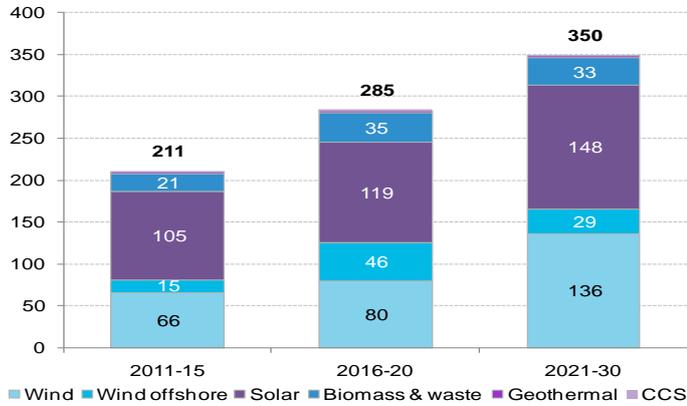
Total clean energy investment in the power sector, including the cost of replacing and/or refurbishing aging installations, is expected to hit just below \$6 trillion over the next 20 years. Up to 2020, an average \$248bn will be invested each year, increasing to \$350bn from 2021. Solar will attract around half of the spend, at \$1.1 trillion between 2011 and 2020 and \$1.5 trillion in the next decade. Wind (onshore and offshore) will follow, absorbing a little over one-third of total investment this decade and 41% over the next. The relatively high levels of investment in wind are due to the large number of new offshore installations expected in Europe, mainly UK and Germany, before 2020 as well as the refurbishment of old wind farms in the EU, US and China over 2026-30.

The focus of the renewable power market is rapidly moving away from the traditional mature markets of Europe and the US. Smaller markets are expanding far more aggressively as their power demand ramps up more quickly and – more importantly – there remains considerable unexploited potential for renewable power in these regions. This paints a stark contrast to Europe for example where suitable sites for onshore wind are getting harder to find. In absolute terms Europe will be the biggest market for renewable power over the next five years, attracting 26% of the finance, but for the rest of the period, China will take pole position, with some 20% of new investment. The MENA market will also grow very quickly – over 400% over the next 20 years – with most of the investment from solar technologies replacing oil-fired power plants.

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

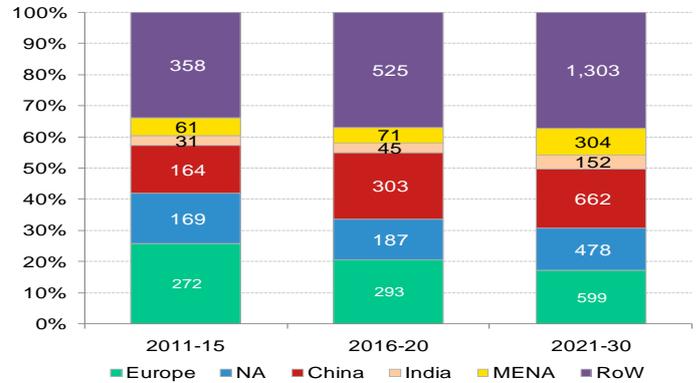
Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

**Figure 5: Average annual investment in clean energy in the power sector by technology (\$bn)**



Source: Bloomberg New Energy Finance

**Figure 6: Clean energy investment in the power sector by region (\$bn)**



Source: Bloomberg New Energy Finance

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

## SECTION 2. CHINA

Renewables are scheduled to play a key part of China's strategy to meet its growing energy demand. Around 17% of the country's power comes from renewable energy, including hydro, and this figure will need to increase significantly to achieve the national non-fossil fuel policy targets.

### Market drivers

#### Power demand

Economic growth has increased power demand in China to such an extent that power rationing has already been usual in some coastal and central provinces for years. The country's power generation reached 4,228TWh in 2010, surpassing that of the US and making it the largest power producer in the world. And these trends show no signs of abating.

GDP will remain the dominant driver of power demand. According to our modelling the electricity intensity of the Chinese economy will decrease by 3-4% per year this decade due to higher penetration of energy efficiency and structural changes of the economy. Nevertheless, strong economic growth will continue to drive up power demand.

#### Environmental targets

China has several policy targets that could have an impact on the energy sector and growth in the renewable market. A key of China is to reduce carbon emissions per unit of GDP (carbon intensity) by 40-45% by 2020 on 2005 levels. This target however is unlikely to be an important driver of renewable energy investment as structural changes in the Chinese economy (away from heavy industry) and the natural attrition and/or replacement of aging polluting factories by more modern facilities will most likely lower the carbon intensity of the economy enough for the country to meet this target.

The more relevant target is the government's intention to increase the share of non-fossil fuel energy sources to 11.4% of primary energy consumption by 2015 and to 15% by 2020. Although non-fossil fuel includes both nuclear and renewable energy sources, the target will certainly require significant new investment in renewable energy technologies. By 2020, China aims to have at least 160GW of wind capacity, 30GW of biomass & waste-to-energy and 50GW of solar. To incentivise this investment, China currently provides fixed feed-in tariffs for wind, biomass power, waste-to-energy and solar PV projects. In addition, China has introduced subsidies for rooftop and building integrated solar PV, and is considering to adopt a renewable portfolio standard for grid and power companies later this year.

### Outlook

Our analysis shows that in China installed capacity of all types of power generation is forecast to increase by just under 150% over the next 20 years (Figure 7). It will add approximately 35GW of coal, 13GW of nuclear, 12GW of hydro and 26GW of other renewables every year up to 2020 (average growth). In the renewable sector China has historically favoured wind power, which accounted for 86% of renewables capacity in 2010. While wind (onshore and offshore) will retain the top spot by 2030 with 346GW, solar installations are expected to grow at a far faster rate, reaching 194GW by 2030 from 0.8GW in 2010. The capacity of biomass and/or waste incineration plants will climb 2.5GW a year this decade and 2GW a year over the next.

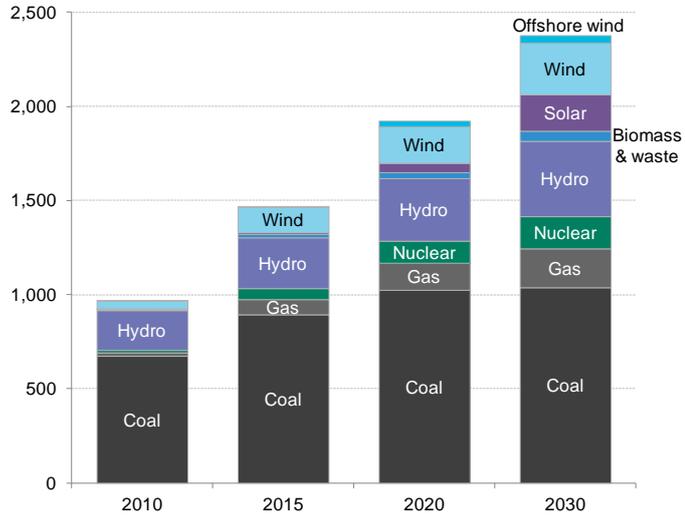
Figure 8 shows the increasingly important role of renewable energy in the country's power generation fuel mix. In 2010 all renewable electricity accounted for 17% of total power generation. In less than five years we expect this fraction to rise to 21%, reaching 24% by 2020 and almost 30% in 2030. Including nuclear, the share of clean electricity increases from 22% in 2010 to 33%

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

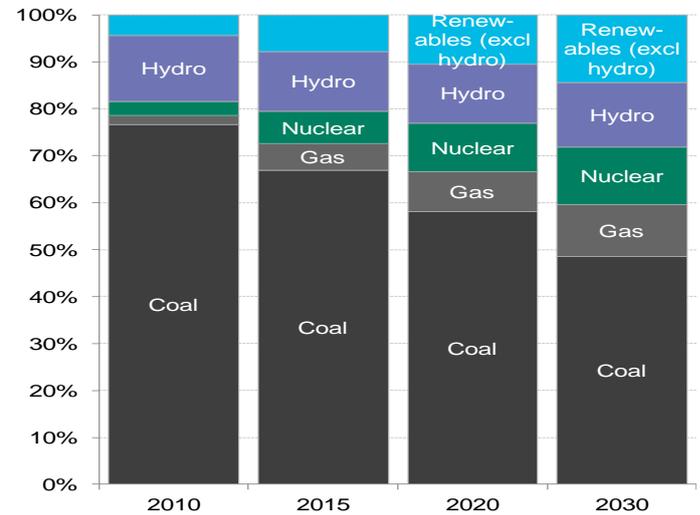
in 2020 and 40% in 2030. In addition, natural gas will boost its rather trivial share of 2% in 2010 to 8% of total generation in 2020 and 11% in 2030. These developments will reduce the carbon intensity of the power generation sector by 33% by 2030: at the end of this decade, every MWh will generate 0.67tCO<sub>2</sub>e compared with 0.85tCO<sub>2</sub>e in 2010, declining to 0.57tCO<sub>2</sub>e by 2030.

**Figure 7: China total installed capacity by technology (GW)**



Source: Bloomberg New Energy Finance

**Figure 8: China power generation fuel mix (%)**



Source: Bloomberg New Energy Finance

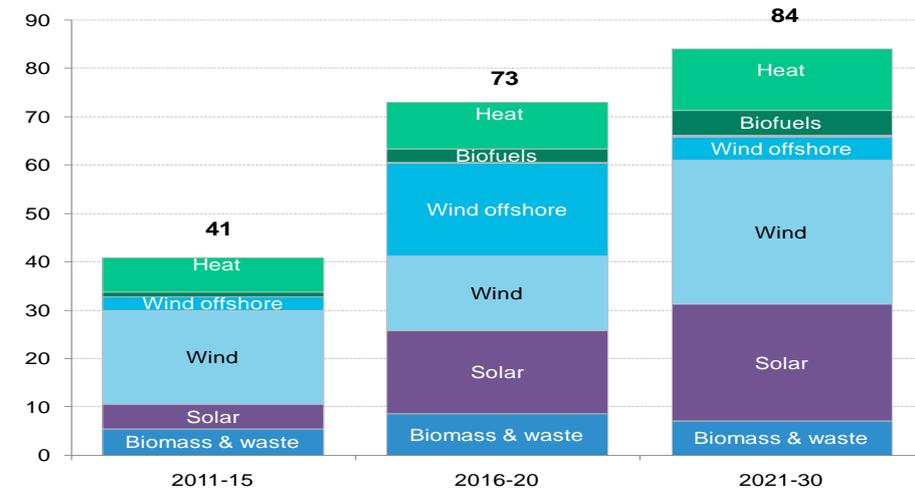
In terms of investment dollars, China is projected to remain the world's largest market for clean energy investment worth \$1.4 trillion over the next 20 years, equivalent to 20% of the world market. Wind will secure approximately \$240bn by 2020, of which \$110bn will go to offshore projects. Between 2021 and 2030 the wind market will increase to just over \$270bn but the share of offshore technologies will reduce to \$50bn. This increase in the onshore market size will be driven as much by the refurbishment and/or repowering of existing aging wind farms as new capacity additions.

The Chinese solar market will also grow significantly, but up to 2020 it will remain around half the size of the wind market. Some \$112bn is expected to be spent on solar power generation technologies up to 2020 decade, half of which will go to small-scale installations. Over 2021-30 the solar market will increase more rapidly as costs continue to fall and fossil subsidies are phased out. Our central projection is that investment in solar capacity will increase to \$241bn between 2021 and 2030 with solar PV projects taking the lion's share.

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

Figure 9: China average annual investment in clean energy (\$bn)



Source: Bloomberg New Energy Finance

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

---

## SECTION 3. OUR APPROACH

The Global Renewable Energy Market Outlook presents the latest forecasts from Bloomberg New Energy Finance on the future size of the world renewable energy markets. The projections extend to 2030 across all renewable energy technologies and regions. The analysis uses Bloomberg New Energy Finance's proprietary model of the global energy system and clean energy technologies – the Global Energy and Emissions Model (GE<sup>2</sup>M) – together with expert interpretation of current and proposed energy policies and targets. The model incorporates short-, medium- and long-term projections of energy demand based on economic, demographic and technological drivers as well as detailed sector and technology analyses covering all sectors of the economy and types of fuel.

The analysis has drawn on the contribution of over 65 technical experts within Bloomberg New Energy Finance across all the main renewable energy technologies and geographical regions. The short-term market projections are based on our detailed understanding of the construction pipeline in each sector, while longer-term forecasts use a combination of modelling energy policies in each region and the costs and resource availability of each technology in each major country. The analysis covers asset finance in all the main forms of renewable energy including small distributed capacity as well as those used for power generation, heat and biofuels.

In our modelling we have examined 77 countries. These account for approximately 95% of total installed capacity of clean energy technologies, more than 90% of total energy demand and more than 90% of global GDP. The remaining small markets have been treated as a single market. The modelling approach varies by country and is contingent on data availability as well as the current size and potential of each market (country).

# GLOBAL RENEWABLE ENERGY MARKET OUTLOOK WITH A SPECIFIC FOCUS ON CHINA - JUNE 2012

Originally published in Top Capital [www.topcapital.com.cn](http://www.topcapital.com.cn). Republished with permission

## ABOUT BLOOMBERG NEW ENERGY FINANCE

Bloomberg New Energy Finance is the world's leading independent provider of news, data, research and analysis to decision makers in renewable energy, energy smart technologies, carbon markets, carbon capture and storage, and nuclear power. Bloomberg New Energy Finance has a staff of 200, based in London, Washington D.C., New York, Tokyo, Beijing, New Delhi, Singapore, Hong Kong, Sydney, Cape Town, São Paulo and Zurich.

Bloomberg New Energy Finance serves leading investors, corporates and governments around the world. Its Insight Services provide deep market analysis on wind, solar, bioenergy, geothermal, carbon capture and storage, smart grid, energy efficiency, and nuclear power. The group also offers Insight Services for each of the major emerging carbon markets: European, Global Kyoto, Australia, and the U.S., where it covers the planned regional markets as well as potential federal initiatives and the voluntary carbon market. Bloomberg New Energy Finance's Industry Intelligence Service provides access to the world's most reliable and comprehensive database of investors and investments in clean energy and carbon. The News and Briefing Service is the leading global news service focusing on clean energy investment. The group also undertakes applied research on behalf of clients and runs senior level networking events.

New Energy Finance Limited was acquired by Bloomberg L.P. in December 2009, and its services and products are now owned and distributed by Bloomberg Finance L.P., except that Bloomberg L.P. and its subsidiaries distribute these products in Argentina, Bermuda, China, India, Japan, and Korea. For more information on Bloomberg New Energy Finance: <http://www.bnef.com>

### Contact details

Jun Ying Head of Research, China	jying10@bloomberg.net +86 10 6649 7522
Christos Katsileros Lead Analyst, Clean Energy Economics	ckatsileros2@bloomberg.net +44 203 216 4784

### Copyright

© Bloomberg New Energy Finance 2012. This publication is the copyright of Bloomberg New Energy Finance. No portion of this document may be photocopied, reproduced, scanned into an electronic system or transmitted, forwarded or distributed in any way without prior consent of Bloomberg New Energy Finance.

### Disclaimer

The information contained in this publication is derived from carefully selected public sources we believe are reasonable. We do not guarantee its accuracy or completeness and nothing in this document shall be construed to be a representation of such a guarantee. Any opinions expressed reflect the current judgment of the author of the relevant article or features, and does not necessarily reflect the opinion of Bloomberg New Energy Finance. The opinions presented are subject to change without notice. Bloomberg New Energy Finance accepts no responsibility for any liability arising from use of this document or its contents. Bloomberg New Energy Finance does not consider itself to undertake Regulated Activities as defined in Section 22 of the Financial Services and Markets Act 2000 and is not registered with the Financial Services Authority of the UK.