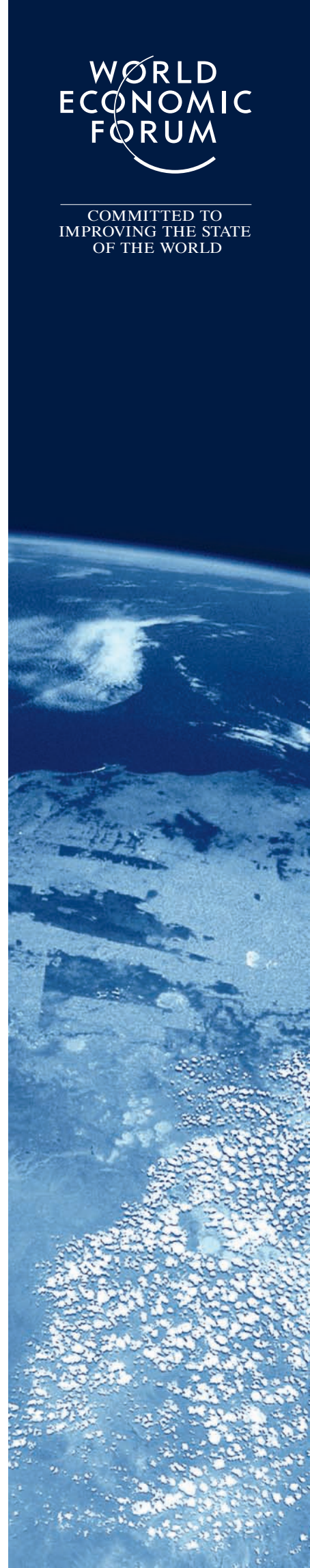
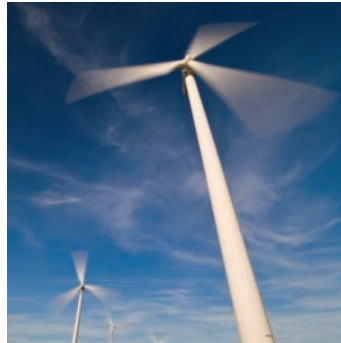


# Green Investing 2011

## A Preview



# Green Investing 2011: A Preview

The clean energy space, like the rest of the world, has seen significant change since the World Economic Forum and Bloomberg New Energy Finance released the first *Green Investing* report in January 2009.

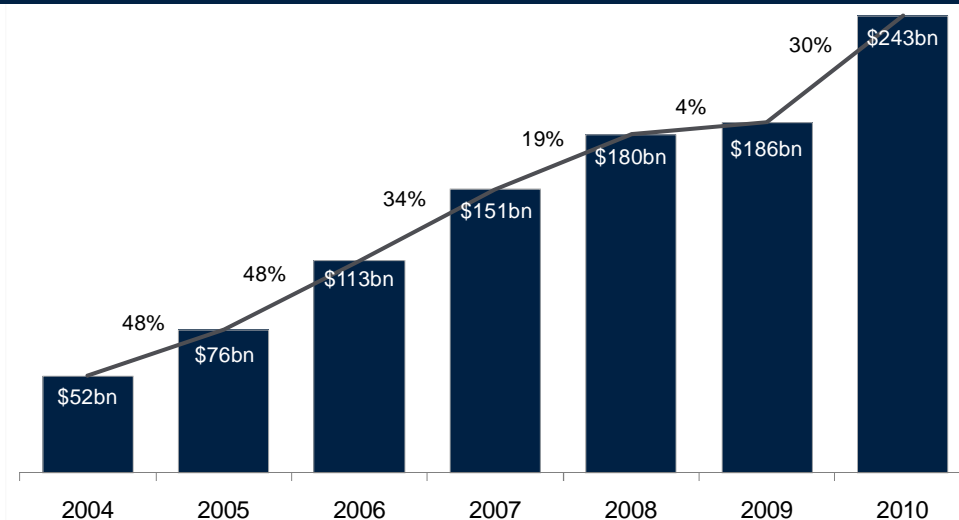
In the first report, *Green Investing 2009: Towards a Clean Energy Infrastructure*<sup>1</sup>, the World Economic Forum and Bloomberg New Energy Finance described what a low-carbon energy system would look like, and estimated that it would require investment in clean energy to grow to US\$ 500 billion per year by 2020 for global warming to be limited to 2°C without compromising economic growth. Last year's report, *Green Investing 2010: Policy Mechanisms to Bridge the Financing Gap*<sup>2</sup>, focused on the range of policy tools that might help spur these large-scale flows of finance. This year, the third report in the series will show that, despite the very difficult economic environment, the clean energy industry has made significant progress, reaching the half-way mark towards the US\$ 500 billion per annum investment target.

*Green Investing 2011: Reducing the Cost of Financing* will be published in March 2011. In it, the World Economic Forum and Bloomberg New Energy Finance will summarize the progress made in the clean energy sector (as measured by investment, deployment and levelized costs). The upcoming report should be of particular interest to financiers, investors, corporations and policy-makers alike, as it will also take a close look at how potential reductions in financing costs and increases in financial innovation could lower the cost of clean energy.

## Progress in 2010

Global clean energy investment surged 30% in 2010 to a new record of US\$ 243 billion. This represents a major milestone for a sector that enjoyed an average compound annual growth rate of 37% between 2004 and 2008, but then saw growth stall in 2009 in the face of the worst recession in half a century.

Figure 1: Global total new investment in clean energy, US\$ billions



Note: Figures may differ slightly from those previously published, due to a revised methodology that takes better account of balance of plant costs for distributed generation capacity. Figures include investment in renewable energy, biofuels, energy efficiency, smart grid and other energy technologies, carbon capture and storage, and infrastructure investments targeted purely at integrating clean energy. Investment in solar hot water, combined heat and power, renewable heat and nuclear are excluded, as are the proceeds of mergers and acquisitions (which does not contribute to new investment).

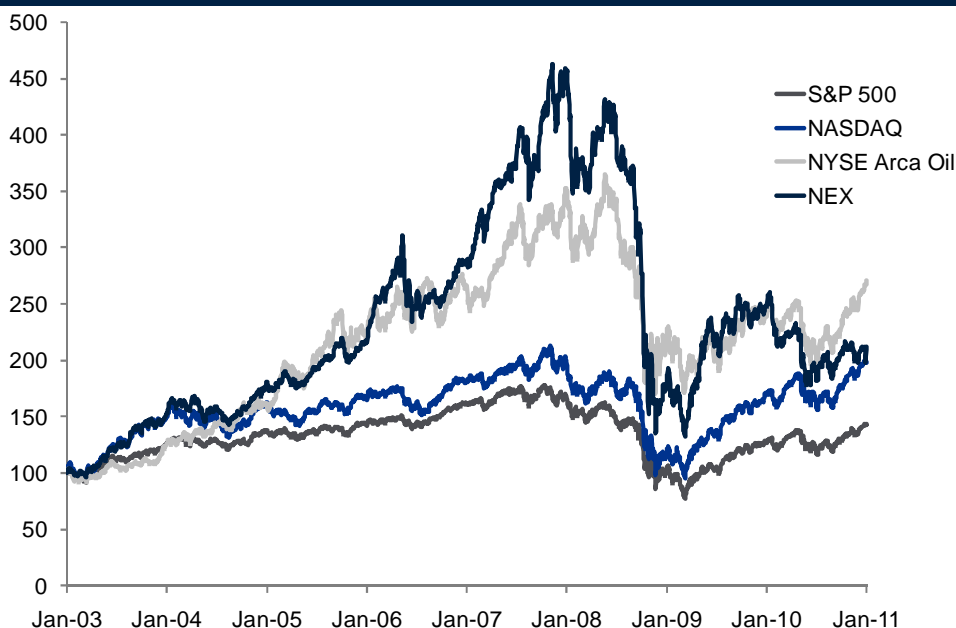
Source: Bloomberg New Energy Finance

<sup>1</sup> World Economic Forum in collaboration with Bloomberg New Energy Finance, *Green Investing 2009: Towards a Clean Energy Infrastructure*, [http://www3.weforum.org/docs/WEF\\_IV\\_GreenInvesting\\_Report\\_2009.pdf](http://www3.weforum.org/docs/WEF_IV_GreenInvesting_Report_2009.pdf)

<sup>2</sup> World Economic Forum in collaboration with Bloomberg New Energy Finance, *Green Investing 2010: Policy Mechanisms to Bridge the Financing Gap*, [http://www3.weforum.org/docs/WEF\\_IV\\_GreenInvesting\\_Report\\_2010.pdf](http://www3.weforum.org/docs/WEF_IV_GreenInvesting_Report_2010.pdf)

The largest investment asset class in 2010 was the asset financing of utility-scale projects such as wind farms, solar parks and biofuel plants. This rose 19% to US\$ 127.8 billion last year. Venture capital and private equity investment had a strong year, up 28% from a relatively depressed 2009 total to reach US\$ 8.8 billion, though failing to match 2008's record figure of US\$ 11.8 billion. Public market investment bounced back from its recession-driven lows in 2008 and 2009, up 18% to US\$ 17.4 billion in 2010. This fell short of the US\$ 24.6 billion of clean energy stocks in 2007, but the fact that public market investment bounced back despite the WilderHill New Energy Global Innovation Index (the NEX) of clean energy stocks dropping 14.6% and underperforming the S&P 500 by more than 20% signifies the resilience of the sector.

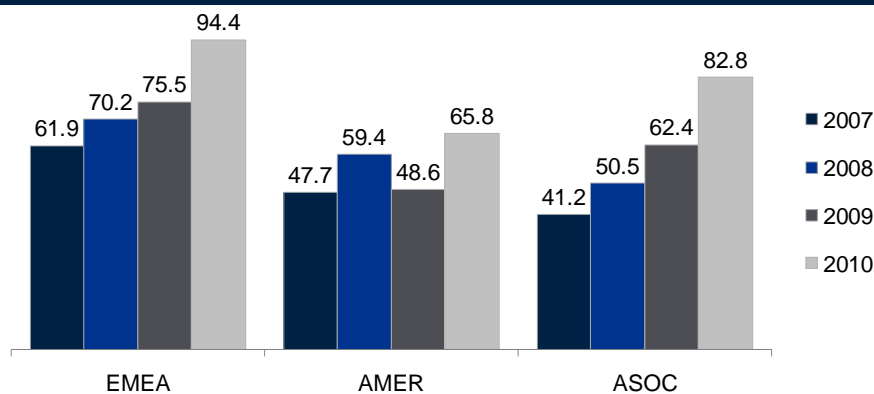
**Figure 2: Performance of the WilderHill New Energy Global Innovation Index 2010**



Source: Bloomberg New Energy Finance

In 2009 Asia and Oceania overtook the Americas, and in 2010 it drew level with Europe, the Middle East and Africa as the leading region of the world for clean energy investment, largely as a result of activity in China, where investment was up 30% to US\$ 51.1 billion, by far the largest figure for any single country. China now produces well over half of the photovoltaic modules used globally and is home to several of the biggest brands in the sector. China installed approximately 17GW of new wind capacity, about half of the global total, with virtually all the equipment being supplied by domestic manufacturers. No other country came close in terms of new power generating capacity added, manufacturing expanded or funds attracted.

**Figure 3 Total new investment in clean energy by region, US\$ billions**



Source: Bloomberg New Energy Finance

But it was investment in small-scale, distributed generation projects that really stole the spotlight in 2010, surging by 91% to US\$ 59.6 billion and now accounting for approximately one in four dollars invested in clean energy. Germany alone saw 8.5GW of new photovoltaic capacity added in 2010, an all-time record, mostly in the form of small-scale residential or commercial rooftop systems. Other countries with feed-in tariff systems, including the Czech Republic, Italy and now the United Kingdom also saw rapid growth, as did certain US states.

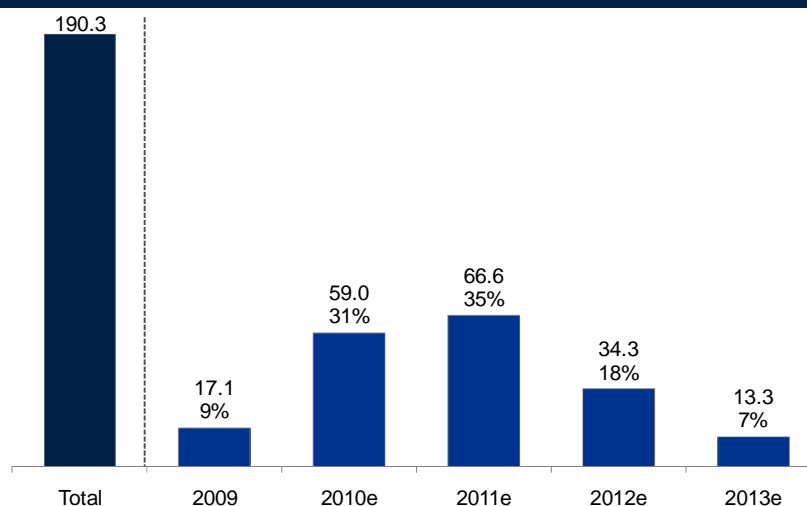
The mass scale-up of small-scale solar was driven by an extraordinary decline in the cost of photovoltaic modules. For several years, progress along the so-called “learning curve” was suspended by a global shortage of solar-grade processed silicon. That bottleneck broke in 2008, allowing prices to fall very quickly thereafter.

## Challenges

Not all news has been good news in the clean energy world. Debt markets have remained fragile, and Europe in particular continues to be roiled by the aftermath of the financial crisis. Confronted with massive national budget deficits, key countries that had been major supporters have been cutting back support – and Spain and the Czech Republic have cut tariffs retroactively. Accelerated reductions in rates are likely to occur in most feed-in tariff markets in 2011, starting in Germany. In the US, clean energy continues to suffer from the lack of a federal climate or energy bill, as well as from competition from low-priced natural gas. In China, accelerating inflation could lower the unprecedented levels of debt targeting what is one of the national economic priority sectors. But none of these has been sufficient to derail the sector’s progress.

Helping to counter these obstacles, the clean energy industry in 2010 enjoyed an unusual level of support from governments around the world in the form of stimulus funding. As discussed in the second *Green Investing Report* last year, no less than US\$ 190 billion<sup>3</sup> in stimulus has been pledged to clean energy since the start of 2009. Those funds have played a key role in supporting the sector through what could have been difficult times. It took some time for these funds to start to flow, but estimates indicate that 2010 saw a US\$ 59 billion investment from this source. However, less than half the stimulus has actually “hit the street” to date. The positive for the industry is that plenty remains to be spent in the next two years, though with government deficits rising, the possibility of the funds being rescinded is also increasing.

Figure 4: Global stimulus spending on clean energy, US\$ billions



Note: Last year’s report estimated a total of US\$ 177 billion had been allocated to renewable energy. The US\$ 190 billion figure is updated to reflect exchange rate effects and additional allocations made between the launch of the second report and November 2010.

Source: Bloomberg New Energy

<sup>3</sup> Last year’s report estimated a total of US\$ 177 billion had been allocated to renewable energy. The US\$ 190 billion figure is updated to reflect exchange rate effects and additional allocations made between the launch of the second report and November 2010.

Stimulus funding has only been one reason for the resilience of the sector over the past few years. Of even greater importance has been the extraordinary progress made by all clean energy technologies in driving down their so-called “levelized costs” (the cost per unit of energy before taking into account any support mechanisms or subsidies). Today, geothermal, biomass and wind projects can compete with and surpass their fossil-based rivals in increasingly significant energy markets. Brazilian sugar-based ethanol has been competitive with gasoline on an unsubsidized basis for some time. Photovoltaics have already reached parity with retail electricity prices in certain parts of the world – Italy and Hawaii and parts of other US states – and will undoubtedly do so elsewhere soon.

Looking ahead, the clean energy sector appears to be poised for further strong growth. To date, government support has played a decisive role in dictating financing flows; where supportive policies have been put in place, private dollars have followed. With equipment costs set to continue falling, however, growth will increasingly be driven by economic demand.

In recent years, the decline in the cost of clean energy has been due almost entirely to lower equipment costs resulting from growing scale in the supply chain. But there are two other ways in which costs are set to be driven down. The first is R&D. Research and development spending on clean energy technologies by companies and governments grew to a record level in 2010, up 24% to US\$ 35.5 billion from US\$ 28.6 billion in 2009 and US\$ 20.5 billion in 2005. The fruits of this growing research pipeline will filter through into the market over the coming years.

The other important driver of the cost of renewable energy is the cost of financing. Because of their structures (with all fixed costs up front and minimal marginal costs), clean energy projects are particularly sensitive to interest rates. As the capital markets continue their long process of recovery from the crisis of 2008 – punctuated no doubt by further negative developments – the effective interest rates paid for all infrastructure projects are likely to come down, and this should differentially benefit clean energy. Every few basis points of reduction in debt costs impacts the fate of hundreds of clean energy projects representing gigawatts of new capacity.

## Innovation

Clean energy developers and backers are further innovating – not just in the technologies they employ but also in their financing mechanisms. Examples in the past year include wind leases in Turkey and the US, listed equity funds purchasing assets and development portfolios in France and Germany, a project bond financing for solar in Italy, and a pension fund directly owning a stake in a Danish offshore wind farm.

Another factor pointing to strong demand for clean energy in coming years is the likelihood of a return to higher energy prices. Oil prices have already risen much of the way back to the epoch-making level of US\$ 100 per barrel; in the US, the combination of high oil and commodity prices with low gas prices is unlikely to persist in the longer term.

Overall, therefore, there are promising signs that the industry’s strong momentum can be maintained. Investment in the sector has perhaps surprised us all by its resilience in the face of crisis. It now remains to be seen whether it can continue its progress towards the magic figure of US\$ 500 billion per annum by 2020.

*Green Investing 2011: Reducing the Cost of Financing* will provide an in-depth analysis of current industry performance and trends as well as areas of potential growth in the clean energy sector. We hope the report will serve as a useful reference to decision-makers as they determine how best to allocate resources to the sector.



*If you are interested in learning more about or receiving a copy of the upcoming Green Investing 2011: Reducing the Cost of Financing report, please contact Anuradha Gurung, Associate Director, Investors Industries, World Economic Forum, at [anuradha.gurung@weforum.org](mailto:anuradha.gurung@weforum.org).*