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INSIDE

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2011 PREVIEW: A YEAR OF FALLING COSTS AND RISING VALUATIONS?

MONTHLY VIP BRIEF

By Michael Liebreich

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So the new year is up and running, and as is customary, this is the point at which I have to take a stand and put down on paper what I think it is going to bring for our sector. Overall my guess is that 2011 is going to be – deep breath, crossed fingers – a very good year indeed.

In the end, 2010 turned out better than expected. It logged a new record total of $243bn of investment in clean energy, driven by a continued push in China, an explosion of activity in rooftop solar, and a rising tide of stimulus funding. Almost all sectors had a reasonably good year, although there were the usual dramas and disappointments along the way – perhaps most notably the ongoing train wreck that is Spanish photovoltaics and the lack of climate or energy legislation in the US.

The positive forces that drove the sector in 2010 are still largely in place at the start of 2011. Yes, there will be further erosion of clean energy feed-in tariffs to follow last week's announcement from Germany. And yes, there will be over-supply of equipment in all sectors, and hence ferocious price competition and consolidation, particularly among marginal players. These are, however, part and parcel of the industry's journey towards maturity. In any sector growing as tumultuously as this, there will be periods when the supply chain is overwhelmed with demand and prices stand still or rise, and periods of oversupply when prices plummet. Both will be met by much loud complaining by some, and quiet satisfaction by others. Neither should distract us from the underlying direction of travel.

Behind the smoke and the noise, the industry is continuing to make great progress down the cost curve, and we are getting very close to an inflection point in many sectors. This is the year when rooftop solar becomes competitive on an unsubsidised basis in the first few decent-sized markets – Hawaii, southern Italy, other parts of the US, distributed demand in a number of developing countries. Last week we published a white paper demonstrating that solar projects in the Middle East that displace oil-fired power generation – which makes up 76% of Saudi Arabia's electricity supply – would provide an economic return at the country level of 9.4%. Good wind projects around the world are now feeding substantial volumes of power into the grid at prices competitive with gas-fired power, even taking into account the cost of intermittency.

Meanwhile fossil fuel prices are again on the rise, with oil prices up in the $90s per barrel and gas prices up from their lows. The hidden costs of fossil fuels are also moving inexorably into the spotlight, with increasing scrutiny of fossil fuel subsidies, the artificial energy demand they create, and their impact on national finances. Even Iran is moving to reduce fossil fuel subsidies.

The climate debate too is entering a new phase. Climategate may have put climate scientists in the cross-hairs of the sceptic fraternity, but away from the headlines they have continued to reveal the reality of a climatic balance being distorted by human influence. How long can the sceptics bluster without producing

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their own data on the planet's temperature? Without providing their own explanation of the temperature trends of the last 150 years? Without acknowledging the record temperatures of the past decade? Without explaining why the weather disasters that fill our screens, consistent with the predictions of the vast majority of working climate scientists, are each and every one freak occurrences?

Overall, therefore, the clean energy industry is poised to make further strong progress in 2011. But – and there is always a "but" – the level of uncertainty is also unusually high. Last year at this time I predicted a Goldilocks year, neither boom nor bust, and that was largely what we got. This year, while the year looks set to be a good one – perhaps a very good one – there are a few things that could go wrong. So for the first time I am going to list a few "jokers" along with my predictions: cards I may need to play at the end of the year if things go badly awry.

With that preamble, here are my 10 predictions, compiled with the help of Bloomberg New Energy Finance chief editor Angus McCrone and greatly enlarged team of 200 sector experts around the world.

1. Investment grows strongly in MW and modestly in dollars

The 2010 new investment total of $243bn, up 30% on 2009, owed much to greater-than-expected spurts in wind farm finance in China and small-scale solar installation in Europe. The record figure is good news, and is almost half way to the $500bn that we estimate will need to be invested annually to bring global emissions to a peak before 2020.

However it also raises the bar substantially for 2011. The sector will have to run very hard to generate a further increase in investment volumes above last year's total.

The expiry of the most advantageous feed-in tariff rates in Germany and other countries will lead to a slow-down in PV installations in early 2011, just as further manufacturing capacity comes online, mainly in China, Korea and Taiwan. PV prices look set to drop, and drop hard. Continued excess supply, exacerbated by a ferocious export drive by generously-funded Chinese manufacturers, will also drive down the cost of wind turbines. In the longer term, of course, these price drops are what underpins the health of the sector, giving regulators and policy-makers confidence that a switch to clean energy makes sense. But falling equipment prices make driving up investment volumes that much harder.

The coming year should see a noticeable improvement in the supply of private sector debt capital for infrastructure projects, clean energy included.

During the financial crisis and its aftermath we saw a dramatic drying-up of private debt finance for renewable energy in Europe and the Americas as banks struggled to repair their stricken balance sheets. Luckily for the sector, some of the financing burden was taken up by multilateral development lenders such as the European Investment Bank, KfW of Germany and BNDES of Brazil. Those institutions will remain important in 2011, and many – including the World Bank – are planning to raise lending to the sector even further. But they will find themselves increasingly in competition from banks and other private debt providers.

We expect to see spreads on debt for onshore wind and PV in Europe narrow from the 230 basis points they averaged late last year, and alternative financing approaches such as institutional debt funds and bond issues should become more prevalent. We might even see the re-emergence of syndicated debt deals in place of cumbersome (and cosy) consortia.

And at the same time, remember that of $190.3bn in stimulus funding targeting the clean energy sector announced in late 2008 and early 2009, around half remains to be spent, of which we are expecting around $67bn to flow in 2011.

So we see equipment prices coming down, but significantly more liquidity available. Taken together, we expect a substantial increase in terms of MW installed, but with a much more modest increase in the dollar value of investment.

Joker 1: *If the European debt crisis takes another disruptive turn – whether embroiling Portugal, Spain and even Italy, or just a disorderly restructuring of debt in Greece and Ireland – then clean energy project finance in Europe could once again stall, dragging down overall global investment levels in 2011.*

2. Out-performance for the NEX

Shareholders in quoted clean energy companies had a 2010 to forget. The WilderHill New Energy Global Innovation Index (ticker symbol NEX), which now tracks 100 stocks worldwide across all sectors and business models of clean energy, fell nearly 15% during last year, under-performing the S&P 500 by some 25%.

There were a number of reasons for that drab showing, from post-Copenhagen disappointment to the loss of pricing power for manufacturers, worries over tariff support and the rumblings of Climategate. All of these contributed to the sector being left out as asset managers moved money back into the equity markets after their near-death experience of 2008 and early 2009.

Equipment cost improvements and fierce competition among manufacturers will play into the hands of project developers, who also have substantial weighting in the index. Margin pressures will also bring about consolidation in both the wind and solar value chains, as strong players gobble up the weak as a cheap way of adding capacity, resulting in some upside for shareholders. Industrial companies not yet in the sector may never have a better moment than 2011 to gain exposure to clean energy, and there is no shortage of major industrial equipment manufacturers with record levels of cash on their balance sheets, particularly in China, Japan, Korea, Taiwan and Germany.

Smart money is already flowing back into the clean energy sector, and I expect the NEX to out-perform meaningfully during 2011 as a whole. Indeed it stopped under-performing the S&P around the start of December and – although I know better than to try to identify market highs and lows – it is entirely possible that it is already on a roll.

Higher valuations for clean energy stocks should also presage the usual knock-on effects. We should see a healthier environment for raising new funds for private and public equity, as well as for infrastructure. We also expect to see a strong equity issuance market for clean energy firms. In 2010, public market investment was a quite respectable $17.4bn with especially strong deal flow in China, including a number of equity raisings in Hong Kong.

This activity should spread to Europe and the US in 2011 – particularly in smart grid, power storage, solar installation, services and power generators. Last year's annual International Clean Technology Venture Returns Analysis (ICTRA) study showed that venture capitalists are sitting on quite a few portfolio companies that have been making quietly impressive progress despite the recession; some of

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these will be ready for exits in 2011, although M&A will most likely remain more popular than IPOs.

3. Another record year for solar, despite tariff cuts

The solar sector has already started 2011 with a tariff reduction in its anchor market, Germany, which in 2010 accounted for around half of all installations. The industry is still reeling from the retroactive restrictions on hours of generation imposed in Spain and windfall taxes on developers in the Czech Republic.

On the positive side, rooftop installations can now generate electricity at rates competitive with retail prices in countries with plenty of sun and high-priced electricity. And there are significant, double-figure cost improvements to come in 2011.

So although Germany's tariff cuts will reduce returns to developers, they will not eliminate them altogether. Other European markets will show robust growth. Italy will lead the way, with the UK also putting in a strong showing. There, the small-scale feed-in tariff is generating a surge in investment not just in rooftop installations but in institutional-scale groups of projects each just under 5MW and therefore just qualifying for subsidy support. Political opposition to solar subsidies will increase, but not fast enough to choke off the boom (did I nearly say bubble?) in 2011.

In the US the furore over taxpayer dollars going to pay for Chinese-made panels will be somewhat allayed by investments in domestic module capacity, bringing some much-heralded green jobs, and will fail to slow down the sharp growth of rooftop solar across the south-west. Many sunny developing countries will take advantage of lower module prices to take their first tentative steps into the solar project arena.

Overall, therefore, PV investment should grow further this year. The success of PV, however, may cause problems for solar thermal electricity generation (STEG), as developers wonder whether thousands of panels might be a better bet than the troughs and mirrors of a STEG plant. More projects in the US are likely to be cancelled, leaving a select few – such as the BrightSource 392MW Ivanpah project in California which enjoys both a loan guarantee and a cash grant – to proceed unscathed.

4. Trade tensions but no trade war

There is a chance that PV technology finds itself at the centre of a trade war between China and the US during 2011. There will certainly continue to be a background murmur of protectionism throughout 2011, with demands for US action against Chinese solar and battery imports on top of the calls from the United Steelworkers and others last autumn to take action on wind turbines.

However, the real issue remains the value of the yuan, which the US wants to force up. It is not in China's interest to spark an actual trade war; a rising yuan would also help to keep a lid on simmering inflation figures. Most likely, therefore, China will aim to do the minimum required on the yuan to head off actual tariffs, while making lots of noise about economic independence for the benefit of its domestic audience.

Of course it is possible that the appearance of Chinese modules on suburban US rooftops could drive a job-starved US public into frenzy. In Q4 2010, for the first time, Chinese equipment makers were slated to supply a majority of the modules to California rooftop projects, according to our recent analysis. In the US, trade action against China is one of the few issues that could bring together some Democrats and Republicans in Congress, and for that reason it should not be under-estimated as a threat. We expect to see a lot more tub-thumping rhetoric in 2011, and some actual legislative proposals. We will certainly see more local content restrictions around the world, along the lines of those introduced for the Ontario feed-in tariff and the Indian Solar Mission.

However, my prediction is that wind and solar will not be at the centre of an out-and-out trade war in 2011.

5. Wind installations return to growth

Wind turbine manufacturers saw their share prices hit in 2010 as the hiatus in securing finance, power purchase agreements and orders during the financial crisis worked its way through the system. Overall, the wind sub-sector of the NEX index fell a dismal 37% last year as the industry suffered a drop in the amount of new capacity added.

The good news is that installations should rebound by at least 10% in 2011. China onshore and European offshore will be two of the main drivers; the US wind industry, meanwhile, will have the satisfaction of knowing that it has dodged a bullet with the prolongation of the Section 1603 grant programme. Canada should also see firm growth year-on-year as more provinces follow the example of Ontario and put in place supportive regulation. We also expect to see another big jump in wind investment in relatively new markets such as North and East Africa, Latin America and the first significant projects in the Middle East.

6. Competition from gas eases somewhat

One of the big challenges for clean energy over the past two years has been the competition from unusually cheap natural gas. US Henry Hub prices fell sharply from a peak of $13/MMBtu in the middle of 2008 and more usual levels of around $7/MMBtu, to the $4/MMBtu region for most of 2010. This has enhanced the economics of gas-fired generation, and made it difficult for wind developers in the US to find acceptable power purchase agreements.

However we expect the balance to start to shift in 2011. Just as the cost of renewable energy continues to fall, gas prices should be squeezed higher by four influences.

First, switching to gas by US industry and power generators, while it won't be sufficient to absorb the current non-conventional gas glut, will begin. As soon as it attracts the market's attention, it will start to drive up gas futures.

Second, a fascinating comparison shows that since the beginning of 2007, US crude oil prices have risen by 37%, while natural gas prices have fallen by 18%. Although substitution of gas in transportation is a slow and sticky process, it is certainly feasible, particularly in heavy vehicle fleets. It will start to happen – albeit in tiny steps at first – if US natural gas' under-performance in recent years does not unwind.

Third, remember LNG? A few years ago, LNG was the biggest thing happening in the gas industry, creating a price arbitrage mechanism between high and low-priced gas markets. At the time, the US was meant to be an importer. If $4/MMBtu gas prices persist, the US would become an exporter; indeed several groups are rushing through plans to build liquefaction capacity. Whether or not they do, as the LNG market continues to grow, the volatility of gas prices

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should be damped, with both the spikes and the crashes moderated, and prices are not going to stabilise at historic lows.

Finally, increasing public attention will be paid to the impact of shale gas "fracking" on local drinking water supplies. There remains significant mystery around this question and the US Environmental Protection Agency is due to release a major report on the subject this summer. No US mayor wants the local equivalent of a Deepwater Horizon during his or her term of office. Even if it is proven that shale gas resources can be developed without compromising water supplies, the sector should expect more scrutiny and regulation, slowing down projects and driving up costs.

We expect gas prices to start moving up during 2011 and this should ease the relentless pressure on PPA pricing.

Joker 2: *If the US's economic recovery stalls, all bets on gas and oil prices are off.*

7. Electric vehicles and plug-in hybrids generate more Tweets than sales

Electric vehicles were one of the few fashionable sub-sectors of clean energy with stock market investors last year, resulting most notably in a successful IPO by Tesla Motors. Journalists will remain excited for most of 2011 – and not just journalists, but also real drivers. The fact is that EVs are a pleasure to drive – smooth, quiet, and you never need to stop at a gas station. And they are cool, sending the sort of progressive message that was once the preserve of the Toyota Prius. The Twitterati will be delighted.

There is, of course, also the potential for disappointment: you might not have a convenient socket at home, and most EVs have a very limited range. In any case, specialist manufacturers are going to find 2011 tough going as they face a wall of advertising from Nissan/Renault and GM, and we may see some utilities complain that there is a risk that EVs might overload the grid.

Overall, we expect the buzz around EVs and plug-in hybrids to be good. But sales will remain small, small, small. The volumes that manufacturers can deliver in 2011 are very modest, due to cautious plans and an under-developed supply chain. The best indicators of success will be to look at waiting lists and resale values. If these soar, then expect a torrid time for the sector in 2012 and beyond.

8. Balance of investment shifts within Asia

China dominated clean energy investment in 2010, notching up the huge total of $52.2bn, with wind in the lead. While we expect China to put in another strong year in 2011, there will be a slowdown in the breakneck rate of growth.

Meanwhile South Korea and Taiwan are set to surge. The South Korean "green stimulus" package, worth around $30 billion, is the third largest in the world and was only 40% spent by the end of 2010. The country is mounting a particularly strong challenge in wind, with a clutch of domestic manufacturers with familiar-sounding names like Samsung, Daewoo and Hyundai. Taiwan is pushing hard in batteries, LEDs (where it is the global leader) and solar.

In the Middle East, project development, rather than manufacturing, will take off in 2011. There is enough in already-announced tenders for us to anticipate big investment numbers in both wind and PV in Egypt, Morocco, the United Arab Emirates and Saudi Arabia.

Joker 3: *Current Chinese attempts to rein in inflation by tightening monetary policy and increasing bank reserve ratios could bring about a much harder landing than expected. That could hit investment in wind before 2011 is out, and expose the extent of over-capacity in turbine and module production, putting further downward pressure on prices worldwide.*

9. Bio-based materials and second-generation biofuel technologies shine against a dull background

The biofuels sector had a steadier 2010 after a painful three-year spell. It remained under pressure from narrow "crush spreads" between feedstock costs and biofuel prices, but largely managed to avoid corporate failures. We expect to see more of the same in 2011, with high oil prices offset by high feedstock prices, keeping margins modest, and only a low-growth year for US corn ethanol.

The sugarcane ethanol / bagasse-based-electricity model will maintain its momentum in Brazil, as well as expanding significantly into Africa and other parts of Latin America. We could, however, face a return of the food-versus-fuel controversy, if unfriendly weather patterns around the world continue to pile pressure on the price of corn and sugar.

Second-generation biofuels could come up with a few surprises in 2011, as US blending mandates start to loom large and a few firms have gained valuable knowledge from their pilot plants. Companies to watch include Green Biologics, Gevo, Qteros, Cobalt Biofuels and Mascoma. Algae-based biofuels will continue to disappoint their fans, particularly in terms of the economics of fuel production.

Another area we expect to get a lot of attention in 2011 is bio-based chemicals. A number of players have realised that fuels represent the toughest, low-cost, bulk market to crack and are instead targeting more specialised, higher-value commodities. Expect to see a boom in activity in everything from bioplastics to biobased butanol, ethylene and other chemical precursors. With $100 oil, many things are possible using technologies that have been vastly improved during the last five years. Expect to see significant venture and private equity fundings, and even a few IPOs.

10. Progress towards US energy legislation

We have a strong suspicion that President Barack Obama will put energy policy at the centre of his first State of the Union address since the Republican take-over of the House of Representatives. The President is looking for an agenda dear to the hearts of his core constituency and to his political opponents, and energy fits the bill.

In addition to his usual support for renewable energy – offering "green jobs" to his side and energy security to his opponents, he is likely to throw significant (unprecedented for a Democrat) weight behind new nuclear development. The speech, along with the Environmental Protection Agency's actions to reign in emissions from coal plants, will set the stage for a year of wrangling. All of this is likely to take place against a background of high gasoline prices.

While we don't expect a bill including a Federal renewable energy mandate to pass by the end of calendar year 2011, we think real progress towards a legislative consensus will be achieved, and the stage will be set for a significant energy bill in 2012.

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I hope that's given you enough to chew on for the beginning of 2011. It promises to be an eventful year. In almost all sectors, trends and pressures which have been building for a while will come to a head. We are certainly going to finish the year a whole lot wiser than we are now!

All of these topics and more will be debated at the fourth Bloomberg New Energy Finance Summit, which will take place in from 4 to 6 April at the Pierre Hotel in New York. It promises once again to be a thought-provoking event, helped by the usual high-quality, invitation-only crowd, plus the industry's most provocative Thought Leaders and a refreshing blast of American air.

We are structuring this year's Summit around the three big challenges for the clean energy sector: Innovation, Generation and Integration. Monday 4 April will see a strong agenda around technology, plus the announcement of our Bloomberg New Energy Pioneers. Tuesday is all about building generating and production capacity, looking at both asset finance and the supply chain. And Wednesday will deal with the issues around integrating clean solutions into the world's energy ecosystem: transmission bottlenecks, the smart grid, electric vehicles, regulation and competition with other fuel sources. All interspersed, of course, with lunches and dinners, including a Gala Awards Dinner at Central Station on the evening of Wednesday 6 April.

We are also organising a special Roundtable Day on Energy Access and Climate Finance on Thursday 7 April in association with UN-Energy. All summit participants will be welcome to attend, and we are looking to field of good crowd of real-life financiers to help leading global policy-makers think through two questions: 1) How do we ensure that whatever solutions eventually emerge from the international negotiations to replace the Kyoto Protocol are actually workable and scalable; and 2) How do we ensure that some appropriate proportion of those funds makes its way to the 1.4bn people in most need of modern energy sources, including distributed generation and energy efficiency. Details can be seen on www.bnefsummit.com.

I very much look forward to welcoming you in New York in April. Otherwise, let me conclude this unusually long VIP Brief by wishing all friends and clients of Bloomberg New Energy Finance a happy and prosperous New Year! ■

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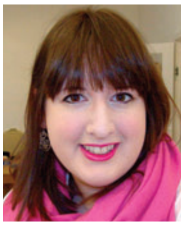
2011: CARBON TAKES A TURN FOR THE BETTER

CARBON COMMENT



By Victoria Cuming

Editor, Carbon, Bloomberg New Energy Finance

Carbon had a fairly bruising 2010. Proposals to implement emissions trading were put on the back burner in Japan and Australia – and thrown out of the kitchen in the US. The markets were hit by multiple instances of fraudulent activity and trading volumes fell by 10%. It was not, however, a complete washout. Thanks to higher carbon prices, the markets' value went up by 5% to reach EUR 93bn ($124bn). China surprised everyone by announcing that it was considering implementing a cap-and-trade scheme. Even the UN climate talks in Cancun in December – expected by some to be 'Copenhagen: the sequel' – made some material progress.

So what's on the cards for 2011? Bloomberg New Energy Finance forecasts renewed growth in the carbon markets this year, with the total traded value to reach EUR 107bn ($143bn) – a rise of 17% on 2010. Europe will still be the main player, taking 90% of the traded volume (2010: 81%). This growth will be driven by higher demand from EU utilities which will receive fewer free allowances from 2013. As a result, prices are expected to reach nearly EUR 20/tCO2e by year-end – their highest level since 2008.

Also from 2013, participants in the European trading scheme will face restrictions on the type of international offsets that may be used for compliance. As a result this year the 'non-eligible' credits will begin to be sold at a discount to credits from other project types as sellers will rush to get as much volume as possible to market before the restrictions bite.

Policy-wise, 2011 will bring mixed fortunes for carbon. A major uncertainty in the European carbon market remains the level of emission reduction target for 2020. This year the EU will continue to spend a lot of time talking about moving from the current goal. But member states are likely to remain at odds, with fiscal and national economic concerns still dictating political agendas.

After years in the carbon wilderness, US prospects will see a revival in 2011 as California creates the country's first meaningful carbon price. The Canadian provinces of Quebec, Ontario and British Columbia are also expected to overcome the political hurdles to join the Golden State by implementing cap-and-trade legislation in 2012. On the less good side, with a stronger Republican presence in the House of Representatives, Congress may agree to delay the Environmental Protection Agency's regulation of emissions by at least two years.

In Oceania and Asia, the carbon prospects are looking rosier. In Australia, Bloomberg New Energy Finance expects new carbon price proposals to be presented to parliament this year – and approved. Our optimism also extends to South Korea where we predict that the National Assembly will pass some form of carbon market legislation this year despite increasing opposition from industry.

Sticking our necks out even further, we predict that China's 12th Five-Year Plan (2011–15) – due for release this year – will outline its intention to launch a cap-and-trade scheme over the next five years. The first steps will however be very tentative. While several cities including Beijing began testing voluntary carbon trading two years ago, the infrastructure at a national level does not exist.

In contrast, the international climate talks in South Africa in December will not deliver a comprehensive global agreement, meaning that a gap between commitment periods under the Kyoto Protocol is unavoidable. There may be progress on key provisions of the Cancun Agreements, particularly climate finance and forestry. But there will be no significant moves regarding collective mitigation targets and these will continue to be driven by national developments. ■