ENERGY TRANSITION ADVANCED IN 2013, THOUGH IT MAY NOT FEEL LIKE IT

By Michael Liebreich

Chief Executive, Bloomberg New Energy Finance

Twitter: @MLiebreich

Yes, it is the time of year when I have to pour a stiff drink, pull up a copy of the predictions I made at the start of the year, and see how many I nailed and how many turned out to be wildly wrong. As always it is a mixed bag. I started my piece in January by saying "As 2013 opens, the smoke is clearing from the energy sector's equivalent of the Battle of Borodino," and closed with Field Marshal Kutuzov stating "The Grand Army is wounded, but is it mortally wounded? An apple should not be plucked while it is green. Patience and time."

See the original here.

Overall, during the course of 2013 I think we saw that the battle of Borodino analogy was about right. At first sight, it was certainly not a super year for clean energy investment – overall investment in clean energy is likely to have fallen for the second year running, the political noises from Canberra to Tokyo, and Bucharest to London, have often been unhelpful and sometimes bafflingly ill-informed, and the annual United Nations climate jamboree (this time in Warsaw) was if anything, even less cop than other recent COPs.

One of the signal events of the year, indeed, was the decision in March by German utility RWE – hitherto one of the big players in European renewable energy deployment – to cut its clean energy spending in half from 2014, followed by moves to cut hundreds of jobs in its renewables arm, Innogy, and to abandon development of the 1.2GW Atlantic Array offshore wind farm.

Over in the US, the Edison Electric Institute, a trade group representing utilities, argued for a review of net metering rules on the basis that they "unfairly shift costs from solar homes to non-solar homes", and in line with this, Arizona's regulator agreed last month that the largest utility in the state could charge a monthly fee to customers who install PV panels on their roofs.

In Australia, new Prime Minister Tony Abbott won an election in September promising to repeal the country's carbon trading system. In Japan in November, the government greatly weakened its emissions target, changing it from a 25% cut from 1990 levels by 2020 to a 3.8% cut from 2005 levels by 2020. In the formerly booming wind power market of Romania, in June the government approved legislation that would hold back the award of green certificates to wind and solar projects – an effective retroactive cut in support for existing projects. In the UK, Prime Minister David Cameron promised to "roll back the green levies" in heated exchanges in the House of Commons this autumn, later allegedly referring to them in private as "green crap." It turned out that he was talking about measures to help pay for insulation in low-income homes rather than about support for renewable energy, yet by that time investor confidence was shaken.

Still, as with the Russian army after the Battle of Borodino, clean energy has been regrouping and demonstrating signs of remarkable resilience. There have been numerous signs of clean energy moving into the mainstream, and becoming so entrenched that, whatever some utilities might hope for, there really will be no returning to the old way of doing things. Here are a few examples.

The first is from Jordan, where last month the International Finance Corporation led a group of lenders providing $221m for a 117MW wind farm, trumpeting the fact that it would "produce electricity at a price up to 25% less than that of thermal power."

The second is from the UK, where the government agreed in October a 35-year strike price of GBP 92.50/MWh for a proposed 3.2GW nuclear plant to be built at Hinkley Point by 2023. This price is above the GBP 90/MWh the same government is offering onshore wind for just 15 years, for projects built five years earlier than that. The offer for photovoltaic plants commissioned in 2018-2019 is GBP 100, only a few pounds above that for nuclear 4-5 years later.

The third is from Spain, where this month Bloomberg News reported on how a local developer, Grupo Enerpro, has completed the country's first megawatt-scale PV park without any public subsidies, near Seville. In Brazil, the average winning bid in the most recent auction of wind capacity was $54.97/MWh, one of the lowest wholesale electricity prices for any technology, anywhere in the world.

The Midwest of the US is seeing power purchase agreements signed at $25/MWh; exclude the impact of the Production Tax Credit and that is an unsubsidised price of $47/MWh, lower than the levelised cost of a new gas plant, even with the US's low gas prices.

Perhaps the most remarkable sign that "clean energy is not dead, long live clean energy" (to mix my historical analogies) has been the remarkable rebound in the value of clean energy share prices, with the NEX index up by 46% so far this year, and 73% since its low in July 2012, as investors have realised that the painful restructuring of the supply side of the industry is drawing to a close, and the demand side is in robust good health.

And so, to our main business: assessing how I did with my 10 Predictions, published at the end of January. Here they are, with my (scrupulously fair) self-assessed marks, allocated in consultation with Bloomberg New Energy Finance Chief Editor Angus McCrone.

1. RECOVERY IN CLEAN ENERGY INVESTMENT

Whoops! The final figures for 2013 are not yet crunched, and more deals will no doubt come to light between now and the publication of our annual data in January – though it is already pretty clear that 2013 will see a lower total for world investment in clean energy (defined here as renewables excluding large hydro, but including energy smart technologies) than 2012's $281bn, and lower still than 2011's record of $317bn.

The figure for the first three quarters of this year was $143bn, though this excludes research and development spending, which we include in the annual figures. From the standpoint of mid-December, it does look as though the 2013 total will finish up around the $250bn mark, some 10% down on last year. That is still a lot of money, and five times the 2004 figure, yet it is a disappointment for sure.

Some of the detail of that prediction, nevertheless, we got right. I said in January that I expected a recovery in clean energy share price valuations "enough to bring about an increase in public market investment" from 2012's miserable total. I justified this partly on the view that the solar sector would be "getting closer to viewing the light at the end of the tunnel...when painful excess capacity gives way to something closer to balance between supply and demand."

Public market investment is in fact likely to do even better than expected, the first three quarters producing 43% more equity-raising than in the whole of 2012, and the NYSE Bloomberg Global Solar Energy Index up at the time of writing by no less than 66% on the year so far.

Score: 5/10

2. WORLD WAKES FROM SHALE GAS SWOON

I predicted, loftily, that 2013 would be the year "when the US recovers from its infatuation with shale gas, moving into a rather more mature and nuanced relationship" and that the UK and other European countries would "resume work on exploiting shale gas, but this will do nothing to restrain prices in the short or medium term." I also said the liquefied natural gas market in Asia would remain tight, with prices uncomfortably high.

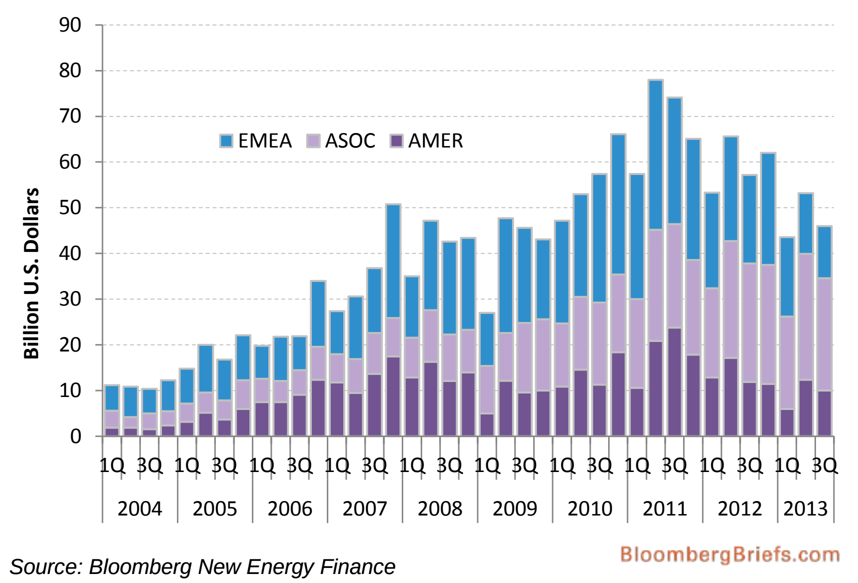
I was pretty much on the money. Henry Hub prices in the US have spent most of the year above the $3.50 mark, and at the time of writing are back up above $4. In the US, excitement continues about the job gas can do in saving manufacturing in that country. Still, it was clear from the Bloomberg New Energy Finance Summit in New York in April that investors and policy-makers have moved from thinking about "gas, gas, gas" to a more considered version of "all of the above," with particular emphasis on shrinking coal and the Keystone XL pipeline. Small-scale solar has been gaining very rapidly in mind-share among policy-makers, both supporters and opponents.

In Europe, the debate has shifted from how shale gas (if it is not banned outright) will inevitably bring about sharp falls in energy bills, to whether local communities want shale gas, how quickly resources can practically be exploited, and what shale gas extraction might actually cost. The major benefit of shale gas in Europe and Asia now looks to be energy security, rather than prices, at least outside China. For the moment, Asian gas prices remain forbiddingly high as Japan and China bid for international supplies.

Score: 7/10

Perhaps the most remarkable sign that "clean energy is not dead, long live clean energy" has been the remarkable rebound in the value of clean energy share prices, with the NEX index up by 46% so far this year, and 73% since its low in July 2012

Clean energy investment in first nine months of 2013 was $142.8bn



Source: Bloomberg New Energy Finance

3. FINANCIAL INNOVATION GROWS FROM A TRICKLE TO…A BIGGER TRICKLE

I predicted that renewable energy projects would attract new sources of capital, via novel financing approaches, mentioning specifically asset-back securitisations and solar real estate investment trusts in the US, and the beginnings of a project bond market in Europe. Here, I would say that I was spot on in terms of the overall theme, though not so much as far as the detail is concerned.

This year has seen heartening innovation in terms of harnessing long-term investor capital. One notable development has been the emergence of so-called "yieldcos." In the US, NRG Yield, a unit of a New Jersey based utility, raised $431m in an initial public offering from investors attracted by its portfolio of wind, solar and gas-fired generation assets on long-term

The year 2013 has also been a record in Europe for direct investment in projects by institutions and pension funds, commitments by the likes of Allianz, Munich Re and PensionDanmark reaching $1.3bn by late October.

contracts. In Europe, four specialist funds holding operating stage renewable energy assets floated on the London market, raising a total of GBP 845m.

The year 2013 has also been a record in Europe for direct investment in projects by institutions and pension funds, commitments by the likes of Allianz, Munich Re and PensionDanmark reaching $1.3bn by late October.

In November, SolarCity became the first company in the US to offer bonds backed by rooftop solar systems. Its initial $54.4m sale may be followed by up to $200m in additional notes as soon as the second quarter of 2014, according to the company's chief financial officer; and this month the European Investment Bank provided a $45.8m guarantee to cover 15% of the value of the new bonds sold to finance the transmission line for the Greater Gabbard offshore wind farm in UK waters, thereby enabling the whole issue to be lifted one notch to an A3 rating with Moody's.

Perhaps the most eye-catching development, very late in the year, has been the explosion of interest in green bonds. These have generally been investment-grade offerings by multilateral banks, who have tapped the market using the full weight of their balance sheet but earmarked the proceeds for clean energy or some other sustainability-related purpose. By the middle of last month, the total volume of green bond issuance worldwide in 2013 had topped $8bn, compared to just over $5bn in 2012 and ahead of the previous record of $6.6bn in 2010. There was then on Nov. 22 a landmark issue of EUR 1.4bn by EDF, twice oversubscribed.

Score: 9/10

4. EUROPE FOCUSES ON ENERGY MARKET REFORMS

At the start of the year I said that Europe would spend much of the year focusing on energy market reforms, rather than either grand new energy schemes or climate commitments. And so it was to be.

Common ground, I said, would be found between fossil and clean energy generators in the idea of capacity markets to encourage the construction of balancing plant to reduce base-to-peak electricity price volatility. Still, I also forecast growing challenges to that approach, from those who preferred to let pure market forces do their work. I also predicted, rather safely, that backloading, the UK's Electricity Market Reforms and Germany's Energiewende would fill the news during 2013.

Capacity markets have indeed moved ahead during the year, into the proposal stage in the UK and Belgium, into the detailed design stage in France, and into a commitment from the new coalition government in Germany. Meanwhile Poland has plans to expand its strategic reserve.

Even at the European level, other than a surprisingly weak attempt to push through a 30% renewable target by 2030, most of the action has been around market reform. This culminated in the publication in November of a consultation document by the EU on "Delivering the internal electricity market" and the innocuous-sounding "making the most of public intervention" – which is EU-speak for suggesting that the exemption of Germany's heavy industry from funding its feed-in tariffs is a form of State Aid.

Score: 9/10

5. TECHNOLOGY, ENVIRONMENT AND DEVELOPMENT

I predicted that "the most dynamic developments in clean energy will continue to take place outside Europe," and that in general developments would be driven by technology, broader environment or economic development concerns, rather than climate.

I talked about California emerging as the leading carbon trading programme in the world, with the highest prices; the US Environmental Protection Agency curtailing the emissions of particulates from the country's coal-fired power stations; and moves by China to curb pollution in its cities by shutting coal plants and limiting vehicle emissions. I also said that 2013 would be the year that hydrocarbon producers in the Middle East start building clean energy at scale.

Most of this came to pass during the year. California does indeed have comfortably the highest carbon prices in the world – although, at $11.65 per ton at the time of writing, it is down from the $14.50 figure of the early summer. It certainly trumps the European Union, where the emission allowance price for December was EUR 4.90 per tonne. As for the US EPA, in September it published draft rules effectively requiring new coal-fired power plants to capture and store a portion of the CO2 they produce. The agency also received substantial support from President Barack Obama, who for the first time in his tenure articulated clearly an administration strategy specifically aimed at combatting climate change. The President pledged to have the EPA draft on new CO2 emissions rules for existing coal plants by summer 2014.

In February, China said it would impose emission limits on six polluting industries, including coal-fired plants, and some cities are proposing vehicle emission curbs, including Shijiazhuang and Shanghai.

China has also become the world's largest solar installation market this year. Still, its hoped-for clampdown on coal remains mostly that (hoped-for). In the Middle East, the renewables bandwagon is still revving up, though it has not really raced forward in 2013. There have been solar financings in Algeria, Oman and the United Arab Emirates, yet it has been megawatts rather than hundreds or thousands of megawatts.

Score: 8/10

6. CHINA, AFRICA, LATIN AMERICA TO DRIVE SOLAR GROWTH

The prognosis here was that solar would remain dominant, accounting for 50% or more of total investment in clean energy in 2013, with investment rising "by a small margin, despite the fact that system prices will be lower than those of 2012." I expected China to overtake

Germany to be the largest solar market, at some 8GW installed, and said that there would be rising PV activity in sub-Saharan Africa and Latin America.

We seem to have been correct on the overall positive tone, although whether dollar investment numbers in solar will be a bit up or a bit down on 2012 remains in the balance at the time of writing. The latest Quarterly Outlook from our solar team, published at the beginning of December, says that PV demand in 2013 is likely to finish up in the 35.8-40.4GW range, well ahead of last year's 30.6GW, and China is on course to be the largest market this year, somewhere in the range 8.5-10.2GW, ahead of Japan's 7.6-8.7GW. The German market is likely to have shrunk in 2013 by more than 50%. And we look likely to be right on solar accounting for more than half of total clean energy investment in 2013.

We seem to have been correct on the overall positive tone, although whether dollar investment numbers in solar will be a bit up or a bit down on 2012 remains in the balance at the time of writing. The latest Quarterly Outlook from our solar team, published at the beginning of December, says that PV demand in 2013 is likely to finish up in the 35.8-40.4GW range, well ahead of last year's 30.6GW.

We perhaps jumped the gun a little on Africa. Up to the third quarter, solar investment has lagged a bit behind 2012 – although that may change when the Q4 numbers are crunched and some extra deals from earlier in the year are unearthed. Latin America already had pushed ahead of full-year 2012 levels for solar investment by the end of the third quarter, with Chile in particular seeing good growth.

Score: 8/10

7. INSTALLATIONS BECALMED BUT FINANCING PICKS UP FOR WIND

The thesis here was that even though wind turbine installation would be about 10% down on 2012's record, financing activity would revive, "helped by the new lease of life for the US Production Tax Credit." This would push overall wind asset finance in 2013 above the 2012 figure, since revised slightly to $75bn.

Well, we are still in with an outside chance on this one. In the first three quarters of 2013, wind asset finance was $44.7bn, so it would take a strong fourth quarter and some newly discovered projects from earlier in the year to take us up to the 2012 number.

Certainly, the pace of investment has picked up in the US after a dismal first quarter. Still, the likelihood is that global wind asset finance will end down on the year, not up, reflecting shrinkage in the Chinese market and a slow year for offshore wind financings in Europe in the face of policy uncertainties in the UK and Germany. Our latest published forecast is for total installations this year to be around 33.7GW, down from 46.6GW in 2012.

Score: 5/10

8. BORING BIOENERGIES MAKE MONEY

I suggested that 2013 would see "an additional 2GW of renewable dispatchable capacity in the EU-27" in the form of biomass-to-power, with a doubling of pellet imports. Another strand was that the relatively "boring" ethanol sector in Brazil would have a good year in 2013, boosted by a bumper sugar harvest, while ethanol prices in the US stayed high because of a bad corn harvest in late 2012.

I have to admit to overcooking this prediction somewhat – our biomass analysts' latest view is that there has been 940MW of new biomass and waste-to-energy capacity commissioned in the EU so far this year, and that pellet imports have risen 50% rather than 100%. We were closer to the mark on biofuels, with ethanol prices in the US staying high for most of the year – but I failed in January to include a forecast that the US EPA would cut its biofuel mandates. The most positive surprise was probably the project financing via Brazil's development bank BNDES of two cellulosic ethanol assets in the country.

Score: 5/10

9. EV SALES SHOW SPARK ACCELERATION

Prediction nine said that shipments of electric vehicles would "roughly double" once again in 2013, reaching 200,000 worldwide, with plug-in hybrid electric vehicles, or PHEVs, staying more popular than pure battery vehicles, or BEVs, by a ratio of 60:40.

Our most recent Quarterly Outlook on advanced transportation said that EV sales in the first half hit 83,479 units and were on course to exceed 200,000 for the full year (in line with my forecast).

Still, contrary to our January prediction, BEVs are poised to take over half the market. Our BEV/PHEV prediction proved to be wrong, as PHEV manufacturers such as Mitsubishi Motors and Fisker Automotive struggled while BEV manufacturers like Nissan Motor and Tesla Motors flourished. Although Fisker filed for bankruptcy in November, the PHEV sector is set for a late rebound as Mitsubishi Motors has recovered from the earlier battery problems of the Outlander PHEV, and the Volvo V60 PHEV has proven to be popular in Europe.

Overall EV sales have continued to increase as manufacturers such as General Motors, Toyota Motor and Nissan have reduced prices and more manufacturers such as BMW and Daimler are launching EVs.

Score: 9/10

10. FUEL CELLS – RAY OF LIGHT AFTER DECADES OF SMOKE

In perhaps my most daring prediction, I said that at least 50MW of stationary fuel cells would be commissioned in the US in 2013, and South Korea would commission a similar amount. I forecast that FuelCell Energy of the US and Germany's SFC Energy would race this year to become the first independent fuel cell manufacturer to become properly profitable.

Our latest estimate is that the US will have commissioned by the end of 2013 some 52.5MW of fuel cells with capacities of greater than 100kW; while South Korea will reach 73.1MW of similar installations by the end of the year. As for the companies, both have produced positive gross profit figures but are still in the red on the net income line. FuelCell Energy may have the edge in this race at the moment, with cash from operations expected to be positive for this year. SFC was hit hard by the impact of the US sequester on its military sales. So, in summary, a good year for fuel cells but not a great one by any means.

Score: 5/10

RESULTS

Well, I make that 70 out of a possible 100. A perfectly decent year for the Bloomberg New Energy Finance prediction machine – characterised by quite a few very accurate predictions, marred by some howlers.

The Bloomberg New Energy Finance Summit in New York on April 7-9 will be looking at the idea of “Phase Change” – the way complex systems rarely exhibit linear growth, instead interspersing periods of seeming stability with periods of extraordinarily rapid change. We’ll be looking at how Phase Change might play out in the energy system – in terms of new technologies, newly-emerging market regimes, new business models and new investment mechanisms. We will also be running the first iteration of Finance for Resilience, or FiRe, our big initiative to help accelerate the flow of finance to clean energy investment around the world. It promises to be our biggest and best Summit yet, and you can find out more by clicking on http://about.bnef.com/summit/

In January, I will be publishing my “10 Predictions for 2014” – wish me luck as Angus and I ponder them over the holidays, helped by our indomitable team of analysts and the odd historian!