



## New Energy Finance – VIP Brief

September 2008



### TIME TO PLOT A NEW FUTURE FOR POLICY ON CLEAN ENERGY

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The clean energy sector has had a tremendous few years, with investment volume soaring nearly five times between 2004 and 2007, but new challenges mean that the next decade of development is likely to look very different. This makes it essential that we use this moment to demand the policy support that the industry will need for that coming decade.

The first and most obvious change is that the era of cheap credit is over. And it is not going to return, until a new generation of go-go bankers arrives, eager to fool regulations that will shortly be introduced to prevent a recurrence of yesterday's credit market mistakes.

The second big change is that the run-up in commodity prices that characterised the past four years looks like it has reached a cyclical peak – with weakening world economies reducing demand, and investment beginning to work through to supply. As more economies slow or go into recession, we should expect the short- to medium-term trend in energy prices to be downward, not upward.

The third change hanging over the future of the clean energy sector is a familiar one – policy uncertainty – but wearing new clothes. One of the drivers of the spectacular growth of the sector since 2004 has been the introduction of a raft of policies: feed-in tariffs, renewable portfolio standards, green certificates, tax breaks, research grants, installation subsidies, green public purchasing, tightened building standards, mandated gas mileage improvements, hydrocarbon taxes, carbon cap-and-trade systems, loan guarantees, innovation prizes, public venture funds, green export credits, earmarked multilateral funds, biofuel blending mandates, solar roof programs, green-collar job creation schemes – you name it, it has been tried, often in a bewildering combination with other support mechanisms.

In country after country, this web of support mechanisms for clean energy is now under review. In the US, the Production Tax Credit and Investment Tax Credit will expire unless renewed in the next four months. There is also intense debate over the Renewable Fuel Standard, with calls for the consumption of 36bn gallons of alternative fuel by 2022 to be relaxed. In the UK, over the summer the government reaffirmed its commitment to the clean energy sector with a tripling of its target for renewable energy, but created uncertainty by launching the Gallagher Review into biofuels policy and a consultation process into the UK's overall renewable energy strategy. In Germany, debate over the appropriate degeneration in the solar feed-in tariffs becomes more heated each year as the cost of the obviously over-generous policy becomes higher, while in Spain there is continuing uncertainty over the shape of policy to support the solar sector after 29 September, when the current tariff structure runs out.

On the world stage, meanwhile the sand-glass is running down in the hunt for a successor to Kyoto: the COP/MOP meeting in Copenhagen in November next year is being billed as the last chance saloon if we are to get a replacement Protocol in place early enough for there not to be a hiatus when Kyoto falls away in 2012. At best there will be a new accord which includes the US and major developing countries; at worst the process will get bogged down, with a new President in the US unable to deliver a deal through Congress.

Rather than being threatened by the resurgent uncertainty over policy, the industry should see this as a unique opportunity to rethink the nature of support it wants from policy-makers.

As a starter here is a list of 10 principles that should underpin a rational set of policies the industry should be pushing for to support the development of clean energy:

### **1. Create a level playing field.**

A carbon price has to be the foundation of any policy regime for clean energy. As long as fossil-based generators can dump their effluent in the air at no cost, large-scale deployment of clean energy will be dependent for its competitiveness on compensating payments, and hence on political largesse. It doesn't matter so much whether the pricing of carbon is achieved via a carbon tax or a cap-and-trade system, as long as it happens. Nor should we be wasting time holding out for a single carbon price around the world. Although this is an attractive concept, it won't happen for the same reason we don't have a single global currency. Countries can only share a carbon price if they are prepared for the inevitable large-scale flows of money from carbon-inefficient to carbon-efficient economies, so we should be happy to see a global patchwork of carbon prices as long as it covers all of the major competing economies.

There is no agreement on the total subsidy being afforded to fossil energy at present, but there is no question that it lies in the tens of billions of dollars per annum, including research grants, exploration concessions, investment tax holidays, accelerated depreciation, export guarantees and soft loans. In some developing countries, there are very expensive subsidies on domestic oil consumption. In particular, the question must be asked why the development banks are still investing heavily in high-carbon energy infrastructure in the developing world.

### **2. Rate support.**

A carbon price alone is insufficient to spur the development of a healthy renewable energy industry. Why? A carbon price is a blunt instrument: it might drive a switch by utilities from coal to natural gas, the implementation of energy efficiency and discourage deforestation, but it is insufficient to stimulate the deployment of a variety of clean energy technologies at different stages of maturity. Once a clean energy technology is within 20% of the cost of fossil energy, it should be able to stand on its own two feet, with utilities choosing to deploy it as a way of hedging against feedstock volatility (as demonstrated by the late Dr Shimon Awerbuch). But until we get there, the goal should be to support renewable technologies during a finite period while suppliers drive their costs down.

The ideal policy here is not a renewable portfolio / renewable fuel standard, nor a system of green certificates (which do not sufficiently reward cost curve progress), nor a feed-in tariff (which transfers all sorts of risks to the energy consumer which should remain with the producer). Instead it is a premium for green over fossil energy that compensates producers on a declining scale for the cost disadvantage of the young technology, and nothing more. Irrespective of the nature of the support mechanism, however, there is a key design principle: the premium should only kick in if electricity prices decline below a certain level. The most promising, nearly-competitive technologies, with proven experience curves, should not right now need any subsidies – their support should take the form of an insurance policy that they will receive support if energy prices drop, no more than that.

### **3. Bridging the Valley of Death.**

There are two ways in which the costs of clean energy technologies are driven down. The first, dealt with above, is the cost experience curve. This works most convincingly in process industries, where accumulating production experience inevitably drives down costs in a fairly predictable fashion. The second way of driving down costs is to get individual clean energy installations up to scale. There is a range of technologies which can only produce clean energy viably if they are operated at scale. But there is a Catch 22 in operation: to produce adequate equity returns for their investors, the projects require debt, and debt investors won't take technology risk. But until the first full-scale plants are built, it is impossible to eliminate technology risk. Technologies currently falling into this "Valley of Death" might include marine power, cellulosic biofuels, large networks of plug-in hybrids and advanced geothermal, even

very large-scale offshore wind turbines and solar thermal chimneys. What is needed is one or more major public funds to smooth the transition of these technologies across the Valley of Death. These should be sufficiently large to pool the risk of multiple technologies and projects, while leveraging the skill of private equity providers and insurance companies and taking only the final tranche of unavoidable, uncorrelated technology risk.

#### **4. Fundamental research and development.**

Although venture capital investment in clean energy technologies has exploded since 2005, it is remarkable first how small the total investment is - \$3.2bn worldwide out of total clean energy industry investment of \$148bn in 2007 – and also how much of it has gone to technologies that have emerged from the labs in the last 10 years, rather than before then. The fact is that the best venture returns in this current cycle have gone to investors who quickly backed companies that already existed before energy prices shot up. Now the emphasis in VC investment has started to return to innovations coming out of the labs, but it is slim pickings. There needs to be a redoubling, in fact several redoublings, in investment in universities, national labs and other publicly-funded research into the fundamentals of energy technology. There is no shortage of promising routes to game-changing innovations, but with the path to market for energy technology often taking 10 to 15 years, commercial players will under-invest in blue sky research.

#### **5. Accelerate the move to ‘digital energy’.**

Government must support investment by utilities in sophisticated software to improve efficiency. It should regulate for the further adoption of smart meters and require two-way data transmission about how, when and where electricity is produced, how it is consumed and at what price. Regulations that have obstructed demand response in some countries must be removed.

The “smart grid” is vital for the optimum integration of renewable energy, particularly from intermittent sources such as wind, solar and marine, and of power from distributed generation.

#### **6. Removal of barriers to clean energy deployment.**

Across sector after sector there are regulatory barriers that restrict clean energy companies from addressing markets. Most important of all the barriers to clean energy deployment is the structure of electricity distribution and the energy markets. Utility regulation has to be redesigned to decouple returns from the volume of electricity sold or the volume of assets under management. Electricity markets need to be restructured to avoid price discrimination against players who cannot guarantee 100% delivery of 100% of their power output. But this is not all. Other barriers to the deployment of clean energy can include building codes, health and safety regulation, appliance certification rules and so on. It is the duty of governments to ensure that standards play the role of encouraging new players and technologies, not of excluding them and slowing down their access to markets: efforts to establish codes governing access to the energy markets for new energy providers cannot be left to industry bodies which represent the interests mainly of incumbents.

#### **7. Green public purchasing.**

With central, regional and local government accounting for 35-45% of economic activity in all of the world’s largest economies, public sector purchasing can be a powerful force in creating markets for clean energy. Mandate clean energy usage in public procurement. Between 1998 and 2000, then-President Bill Clinton required the US military to move to 20% biodiesel for all nonmission-related fuel usage – this has been the single biggest driver of the development of the US biodiesel sector to date. This type of initiative, applied across the public sector would create guaranteed markets for leading innovators in transport, heat and electricity which entrepreneurial companies would rapidly address.

#### **8. Efficiency standards and regulation.**

Economic incentives can only be effective in reducing a certain proportion of our carbon footprint. While utilities and energy-intensive industries will respond to carbon prices and other

price signals, many individuals and businesses will simply not do so. This is why there will always be a role for regulation to mandate certain changes in behaviour. Appliance efficiency and standby power limits, corporate average fuel economy (CAFE) standards and building codes are all areas in which voluntary action by consumers on the basis of price signals would simply not work, or take too long to be effective.

#### **9. Investment in enablers.**

The new clean energy ecosystem will depend on services and enablers which are in no individual player's interest to build. Targeted and smart public investment in education, transportation, basic science, testing services and the creation of industrial clusters could pay substantial dividends in accelerating the development of the industry. But care has to be taken: with every city, country and trading block wanting to play the same game, it is important to look through the prism of exploiting existing strengths, not that of trying attract the same companies to relocate.

#### **10. Macro-economic conditions for innovation.**

Growing a healthy clean energy sector will require not just the creation of a few national champions, but the evolution of a whole ecosystem of technology and service providers. The speed of this evolution is inextricably linked to the ability of entrepreneurs and companies to create new businesses. One of the reasons that Europe continues to lag venture investment in clean energy in the US by a factor of five to seven every quarter is that the conditions for venture investment in Europe are so much poorer. Spurring economic growth through innovation involves reducing levels of taxation, removing bureaucracy and labour restrictions, providing strong protection for intellectual property and other legal rights, as well as policy stability.

This is a great time to be having the debate. Momentum behind the clean energy sector will continue to carry it forward for some time, especially if energy prices remain high. Projects are on the drawing board; manufacturing capacity is being added; funds have been raised and have to be invested; solid - in some case over-generous – supporting legislation is in place in many jurisdictions; money is being made.

This gives us a unique window to engage policy-makers in the debate. This is not an industry on its knees, begging for protection. Nor is it (yet) an industry that has got fat on subsidy, demanding that pork barrels continue to roll. It is an industry that was held back too long by temporarily low energy prices, competition's free pass to pollute, and a lack of coherent longterm support, but which is finally beginning to assume its rightful place in the world's economy.

We have every right to demand a coherent set of policies to support the industry's long-term development. Let's not squander this opportunity.

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This article is an excerpt from New Energy Finance's Monthly Briefing, published on 25 September 2008. To find out more about the Monthly Briefing service, please call the number above.

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