Contagion in the solar photovoltaic (PV) manufacturing sector claimed its first major Chinese victim in March as Wuxi Suntech, the main subsidiary of China-based Suntech Power Holdings, formerly the world’s largest producer of solar panels, declared bankruptcy.

The declaration was triggered after Suntech defaulted on a $541 million repayment for 3% convertible notes due on March 15.

Suntech had previously stated that it had reached an agreement with 60% of its lenders, but that proved insufficient as nine of its creditors filed a joint application to the Wuxi City Intermediate People’s Court, pushing the company into bankruptcy. The court approved the bankruptcy and Suntech did not object to the ruling.

Wuxi Suntech, which reportedly supplies or contributes more than 95% of its parent company’s products, owed a total of CNY 7.1 billion ($1.14 billion) to creditor banks as of the end of February, according to Xinhua.

The banks stated that Suntech has not produced a feasible repayment strategy, meaning a bankruptcy plan would be required to protect their interests. Suntech is expected to identify a third party able to step in and reorganise the company.

Suntech went bankrupt as PV market volatility hits Chinese manufacturers

Founded in 2001, Suntech was at one time the largest manufacturer of solar panels in the world, passing the 5 GW installed mark in under 10 years. In 2010, the company was still rapidly growing through acquisitions and production expansions.

However, like many of its competitors, it has been stung by a fall in demand from the European sector combined with the heavy drop in solar panel prices over the past two years, and its profit margins rapidly collapsed.

It recorded a loss of $1.1 billion in 2011 and $133 million in 1Q2012, which was the last time it released complete figures on its net profit and loss.

Investors will be examining the case with interest to see whether the Chinese government allows Suntech to go into liquidation or whether it will step in to save the company, either directly or through an intermediary.
The Chinese government announced plans in March to treble domestic solar installations to 10 GW in 2013, a move it hopes will help stimulate the domestic PV market and prevent a chain reaction of manufacturer bankruptcies similar to the one that hit the German solar sector in 2012.

Suntech is not the only Chinese solar producer in trouble. Hanwha SolarOne, GCL-Poly, ReneSola and Yingli Green Energy all announced massive 2012 losses over the past month, while Trina Solar chose not to include loss figures in its 4Q results. None look likely to return to profit any time in the near future.

Market consolidation now appears a certainty. The issue that remains is whether giants like Suntech will be merged with competitors, or simply be allowed to disappear completely.

**Silver Spring Networks IPO is largest smart grid flotation since 2011**

The US clean technology sector received a welcome boost in March when smart grid solutions developer Silver Spring Networks outperformed expectations with an initial public offering (IPO) that closed at almost $93 million, the largest smart grid flotation for more than a year and a half.

Including shares bought by the underwriters to cover over-allotments, California-based Silver Spring sold 5.46 million shares at a price of $17 each – 1.76 million shares more than the 3.7 million it had previously expected. The IPO size of $92.8 million was almost 50% more than the $62.9 million it forecast when it set the price range in February.

Investors reacted positively to the IPO and Silver Spring’s share price spiked by more than 25% to $22 on its first day of trading.

Silver Spring Networks’ IPO is the first completed public flotation by a non-Chinese energy efficiency company since November 2011, according to Clean Energy Pipeline data. It is the largest IPO by a smart grid company since Ningbo Sanxing Electric Co. Ltd. raised $206.5 million in June 2011, and is the biggest IPO by a Western smart grid company since October 2010, when the Germany-based Elster Group raised $242 million through listing on the NYSE.

The transaction is the third-largest IPO by a non-Asian clean energy company in the past five quarters.

Like Solar City, Silver Spring was a viable prospect for public market investors because, unlike many other cleantech companies that have attempted to list, it has built a strong commercial business, with 15.8 million meters and radio devices deployed using its software as of the end of 2012.

This established commercial capability helped offset the fact that the company is still yet to turn a profit and has incurred heavy losses since its inception. Furthermore, Silver Spring’s main venture capital investors all maintained stakes in the company post-IPO, which helped shore up investor confidence.

Although Silver Spring had to lower its target from the $150 million it originally hoped to raise when it filed for the IPO back in July 2011, the relative success of its flotation will likely encourage further venture capital investment in smart grid technology, which remains one of the shrinking number of cleantech sectors that VCs still view as synergistic with their short-term investment profiles.

**Greencoat IPO highlights potential for infrastructure investment in wind**

UK infrastructure fund Greencoat UK Wind completed a £260 million IPO on the London Stock Exchange in March in a transaction that was the largest public flotation by a pure-play European clean energy company since Enel Green Power raised Eur2.6 billion by listing in October 2010, according to Clean Energy Pipeline data.

The Greencoat IPO hit the offering’s maximum target, up from the anticipated mid-range point of £205 million that it announced in February. It sold 260 million shares at a price of £1.00 each.

Investors in the IPO included the UK government’s Department of Business and Skills (BIS), which acquired 50 million shares, and utility SSE plc, which bought 10 million. Institutional investors were also major participants.

Ronan Murphy
Editor
### Venture Capital & Private Equity

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## Project / Asset Finance

97 completed transactions tracked totalling $6.9 billion - top 50 transactions by value displayed here

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Global asset manager Aviva Investors plans to increase its investment in renewable energy, with a focus on operating solar photovoltaic (PV) and onshore wind projects in large Western European economies, the group’s Head of Infrastructure and Renewables Ian Berry told Clean Energy Pipeline.

One specific area where Aviva Investors will continue to expand is the UK residential solar PV sector, following its £100 million acquisition of a 23 MW solar portfolio on behalf of its pension fund clients that was announced in August.

Berry explained that the UK solar feed-in tariff (FiT) provides the kind of inflation-linked predictable returns sought by Aviva Investors’ unleveraged fund vehicles.

“We invest in less than 1% of what we see. One of our significant value-adds is making sure that assets we invest in represent those best suit our investors’ requirements.

“We think we’re very experienced and knowledgeable about this sector; we recognised early on that buying large diversified portfolios of small assets was an area that was quite difficult to do but we thought we could crack it, and I think we have and we’ll do more deals in that sector,” he said. “It is a niche we like because we think we’re adding a lot of extra value for our clients and we’re paying prices vendors are happy with.”

While the portfolio acquired last year benefits from the older, higher FiT that was subsequently cut, Berry is comfortable that the current FiT will support future post-construction investments.

“From a long-term ownership perspective we are happy with the quality of the assets and the long-term certainty of the FiTs,” he said. “As long as the installation costs continue to come down as quickly as they have done, or at least in balance with the level of FiT reduction, then we expect to continue acquiring such assets.”

In addition to UK activities, Aviva Investors expects to focus on the main Western European economies of Germany, France, Italy and Spain. Its other major deal announced last year was the acquisition of a 49 MW onshore wind farm in Spain through its Aviva Investors Renewable Energy Fund, a vehicle that buys operating assets from developers.

Given that political risk is a notable problem for institutional investors and that Spain has continually proven its volatility in this regard through retroactive subsidy cuts and the imposition of a flat energy tax, it is perhaps surprising that Aviva Investors would invest in a Spanish asset, but Berry explained that the decision was a matter of sufficiently pricing risk.

“We are building a diversified portfolio of operational renewable energy assets in Europe,” he said. “If we think we can get a good asset at a price that is appropriate for the risks that we and our investors are happy with, then that might be something we do. That doesn’t mean we would price every risk – the main risk in all of renewables is regulatory risk. Historically, particularly in countries perceived to have more stable regulatory and political regimes, many investors haven’t priced that risk.

“If you take that approach, you can get a good asset at a sensible price where we look at downsides rather than base cases. With Spain, of course we’d be happier if the laws hadn’t been changed, but we still feel sufficiently comfortable with our investment there. We’ve learnt in the last couple of years that we’ve tried to price risk and we’ve probably priced it OK.”

Even when taking this rigorous approach into account, Berry conceded that future investments in Spain would be difficult, especially in the PV sector. However, there is no shortage of viable assets on offer in its other target markets.

“There are a massive number of opportunities out there,” he said. “We invest in less than 1% of what we see. One of our significant value-adds is making sure
that assets we invest in represent those bestsuiting our investors’ requirements.”

While direct investment in offshore wind is not on the table for Aviva Investors at present, the firm could engage in financing offshore wind projects in the future.

Berry said the £100-million investment in the UK solar portfolio represents a good indication of Aviva Investors’ upper limit for capital committed to any single renewables transaction, but stated that this is not definitive, especially given that the group continues to raise money for investment in the sector. However, for the time being, Aviva Investors looks at smaller projects than most other institutional investors, and aims to steer clear of large clean energy infrastructure projects where competition could damage yields.

“We wouldn’t look to participate in very large competitions, particularly at the moment where there is a concern in the infrastructure market that there is a lot of new capital thinking about investing in infrastructure,” said Berry. “If a larger quantity of investors’ capital chases a limited number of deals, they could just end up pushing the yield down. That’s why we try to be innovative and thoughtful in choosing our strategies and sub-sector focus both in renewables and our wider infrastructure activities. Our job is to get the best risk-adjusted returns for our clients.”

One major growth sector for large projects is offshore wind, where Aviva Investors is not yet willing to invest on an equity basis. “We’re not currently looking at offshore wind,” said Berry. “If you are an investor or utility with a lot of money and you need to put it to work with limited resources or time, offshore wind may be a sensible place to do it. It is, however, not in our view the place to get the best risk-adjusted return. That may change, but at the moment we don’t see the premium for offshore as being sufficient compared to what we’re doing elsewhere.”

While direct investment in offshore wind is not on the table for Aviva Investors at present, the firm could engage in financing offshore wind projects in the future, according to Berry.

“Infrastructure debt is challenging,” he said. “Large projects might justify non-bank lenders putting the effort in. Could we consider providing debt to an offshore wind farm? Yes, conceivably.”
SWISS ASSET MANAGER MULLS EXPANSION OF CLEAN ENERGY INVESTMENT INITIATIVE

Jessica Mills-Davies

Switzerland-based global asset manager Capital Dynamics is considering expanding its clean energy and infrastructure investment initiative into North America, Australia, the UK and other European economies over the next 12 months, its Managing Director David Scaysbrook told Clean Energy Pipeline.

“We have a clean energy and infrastructure initiative with a strategy that will focus on investments in North America and the UK and select EU countries and Australia,” he said in an interview. “We are actively evaluating expansion of that strategy now. The sector will continue to be a key focus for us over the next 12 months. From our experience, such initiatives are reasonably prospective.”

Capital Dynamics has witnessed a sustained robust appetite for investment in cash-yielding assets with contracted revenue among institutional investors, including pension funds across Korea, Japan and the UK, and will evaluate further opportunities to mobilise investment as market opportunities evolve.

“We may launch more initiatives as the team grows and as market opportunities change we do things slightly differently in that we tailor investment strategies to suit investment clientele,” Scaysbrook said.

The firm typically invests in global wind, solar, combined heat and power, and biomass assets in partnership with engineering, procurement and construction specialists, and has niche expertise in landfill and coal mine methane generation.

Liberating methane from underground mining operations to generate power makes increasing sense in western economies, according to Scaysbrook.

“Depending on the mine itself, [methane] is vented to the atmosphere in emerging economies, but in advanced western economies like Australia it’s either flared or used for power generation,” he said. “We find that more and more it’s making sense to use the gas for power generation rather than flaring, so we are seeing more power installations at mining operations.”

Capital Dynamics is one of just a handful of operators of coal mine methane-to-energy projects based in the UK but while the sector has apparent room for growth, it is unlikely to expand far beyond current levels as coal mining is replaced by cleaner forms of energy, in Scaysbrook’s view.

“We’ll see some growth, but it is not really on the main radar screen,” he said. “It is analogous to landfill gas, which we do consider ourselves experts in, and which is a similar technology with similar operating parameters.”

Capital Dynamics closed a $282 million US Solar Energy Fund last year that started fundraising in late 2010. The fund secured commitments from 15 global, mostly pension fund investors, from multiple geographies.

With 60 projects in operation or construction (totalling 100 MW), 15 of which are in California alone, it expects to complete investments from the fund within the next six months.

“The most typical investment is for us to commit and start funding or acquire ownership of the projects when they are shovel-ready,” said Scaysbrook. “We partner with developers and we take over the projects when the permitting stage is complete. In that sense we do invest during or prior to construction phase.”

As the US solar market edges closer to the scheduled 2016 expiry of the Investment Production Tax Credit (IPC), tax equity players continue to step forward and capital markets are active in line with a rush to complete projects.

“There is more capital coming into the sector, deal sizes are increasing,” Scaysbrook said. “There is a significant differential in return opportunity between different states. Depending on what state [the project] is in, connection costs and the developer, return on investment can vary significantly.”

Diversifying financial sources for solar portfolios through bond wrappers is one approach gaining popularity as a backstop against a potential capital drought when the incentive expires.

“We’re seeing portfolios of solar being investment grade rated, wrapped for the purpose of bonds,” said Scaysbrook. “We see more capital market activity for solar photovoltaics (PV). More tax equity investors will come to the fore as we move towards the end of the IPC for solar towards 2016. Returns will reduce as a result and we will see a capital holiday from 2016 onwards. The way we see it is the next three years are the critical years for developing and investing.”

Solar project ticket sizes are growing as the cost of solar power catches up with gas thanks to cheaper manufacturing and global competition in the solar market.

“Deal sizes are increasing – you’ve had more time for larger projects to be developed that take advantage of the reduction in PV that we’ve seen in last 18 months,” said Scaysbrook. “Three years ago it would have been cost prohibitive to do a large-scale project of 30 MW or above. These days, they are building solar in California at utility scale at a price less than a cost of a new gas-fired power station, so the game is changing materially with solar being inexpensive.”

California is an attractive market for picking up solar assets with high non subsidy-linked operational revenue potential, according to Scaysbrook.

“Developers can afford to do much larger projects with no subsidies,” he said. “In California, there is no explicit subsidy for solar at all. They price it with reference to new gas-powered facilities and the pay value is a reflective price for the peaking nature of solar, when power is priced more expensively.”

Massachusetts, which has operated a solar credit market since 2010 with a goal to procure 400 MW of solar capacity, and Hawaii, where irradiation levels are high and power prices are exorbitant, remain the most appealing markets for identifying solar acquisition opportunities in the US, Scaysbrook added.

“The best market is Massachusetts, for solar, because of the pricing and mechanism around the value of solar energy credits and a market mechanism that supports the price level,” he said. “The other attractive market is Hawaii, the only country outside the Caribbean where the price offered for solar is less than for other power.”
With the anticipated close of DIF Infrastructure III, DIF expects to have more than Eur1.5 billion of funds under management by the end of the first financial quarter. Five years ago, when Mansfield joined the firm, the firm had just Eur240 million in total funds under management.

“DIF expects to have more than Eur1.5 billion of funds under management by the end of the first financial quarter.”

The target size of DIF's latest hybrid fund is considerably larger than the inaugural Eur750 million for its latest hybrid infrastructure fund DIF Infrastructure III, a vehicle that invests in renewable energy and private-public partnership (PPP) social infrastructure assets, by the end of the first financial quarter, Clean Energy Pipeline has learned.

DIF has a history of investing in both PPP social infrastructure and renewable energy assets through separate funds. Since adopting the hybrid format it has continued to successfully attract investors, the firm’s Managing Director Christopher Mansfield told Clean Energy Pipeline in an interview.

“Providing retrospective cuts are not made, DIF would consider further investments in that market, given that it is one of the largest and most established renewable markets,” Mansfield said.

Nonetheless, DIF is keen to identify existing assets with contracted revenues under power purchase agreements or FITs in Germany, undeterred by agreed measures to cap clean energy subsidies in the run-up to Germany’s federal election in autumn.

“The French solar market has been adversely affected by curtailment of the FIT, which will limit primary market opportunities; but there is a secondary market,” said Mansfield.

“Last May, we launched [DIF Infrastructure III]. To date we have closed subscriptions in excess of EUR600 million and expect to have a final close in Q1-13 at around the hard cap of Eur750 million.”

The target size of DIF’s latest hybrid fund is considerably larger than the inaugural Eur122-million PPP social infrastructure fund that it started raising in 2005, the DIF PPP fund.

“While[ awaiting closes] subscriptions in excess of EUR600 million and expect to have a final close in Q1-13 at around the hard cap of Eur750 million.”

Institutional investors and pension funds have persistently gravitated towards DIF since the launch of its first hybrid fund (DIF Infrastructure II) five years ago, according to Mansfield. Its total funds under management have grown six-fold since prior to raising the now “largely fully invested” DIF Infrastructure II fund.

“The hybrid fund clearly hasn’t adversely affected our fundraising, which has been successful,” said Mansfield. “That makes me think there are institutional investors that appreciate us covering both the PPP and the renewable energy sectors with the same fund, providing them with some diversity. Inevitably some investors prefer pure PPP and some prefer pure renewable energy, but they do recognise that both sectors can provide stable cash flows.”

DIF has broadened its investor base with the latest fund, attracting a mix of Dutch, Danish, Swiss and French institutional investors, in addition to securing a significant proportion of funding from German institutional investors, Mansfield said.

A crucial difference between the two hybrid DIF funds is the respective emphases they place on solar assets. Compared to five years ago, the cost of solar PV equipment and products has fallen significantly with an increase in competition from low-cost Chinese players, lowering capital costs.

“When DIF started investing in renewable energy through the DIF Renewable Energy fund, wind was the only significant and established market opportunity,” Mansfield said. “However, as the solar PV markets emerged, DIF decided to diversify the renewable energy portfolio in DIF Infrastructure II through investment in solar PV in France and Germany.”

Informa now aims to capture a potentially short-lived opportunity to buy solar assets with long-term contracted cash flows before governments across Europe and parts of Asia implement further action to curb spending on the resource as capacity targets reach upper limits.

“For DIF Infrastructure II the renewables [investments] were split 50:50 in wind and solar,” said Mansfield. “For DIF Infrastructure III DIF the renewable allocation will initially be focused on solar photovoltaic (PV) opportunities, believing that there will be fewer large scale solar PV market opportunities going forward due to the curtailment of feed in targets and wanting to secure opportunities currently available.”

Another critical difference between the two hybrid funds is that Infra III has a mandate to invest in Canada and the US. DIF is keen to capture some of the larger opportunities to invest in the North American region, with Eur10-20 million being the minimum investment volume for a single opportunity.

Requirements for tax equity in bigger ticket renewable energy projects mean it is likely that the fund’s first investments in the region will be in solar PV opportunities in Ontario, Canada, which are supported by feed-in tariffs (FITs), Mansfield said.

DIF will also continue to focus on European mainstays such as Germany and France, as it did with DIF Infra II, based on the relative stability of the regions’ macroeconomic and legislative stability, despite cuts to clean energy incentives in both countries.

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“Providing retrospective cuts are not made, DIF would consider further investments in that market, given that it is one of the largest and most established renewable markets,” Mansfield said.

DIF will also consider making investments in any renewable energy asset without FITs in place that provide stable cashflows, as long as they have long-term power purchase contract cover, Mansfield said. He hinted that new asset classes could also be on the cards for future funds.
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“The World will benefit when economy supports well-being”
RWE SPENDING CUTS WILL NOT IMPACT PROJECT PIPELINE AS IT SCALES UP EQUITY CO-INVESTMENT

Jessica Mills-Davies

UK-based clean energy project developer and operator RWE npower renewables Ltd. will increasingly look to equity partners to help finance projects as it scales back balance-sheet investment to rein in spending and meet rising debt obligations, Clean Energy Pipeline has learnt.

The cuts to RWE’s renewable energy spending plan will not affect the group’s 4.2 GW onshore wind project pipeline, Managing Director of RWE npower renewables Julia Lynch-Williams told Clean Energy Pipeline in an interview.

German utility RWE stated this month that its renewables business RWE Innogy will cut investment in new projects over the next three years by approximately 33% as part of an effort to reduce spending. RWE also plans to sell its oil and gas exploration business to meet debts of roughly Eur33 billion.

The German government’s decision to phase out nuclear and a fall in gas prices both impacted utility RWE’s predicted spending volume for the coming years due to its heavy involvement across the conventional energy industry.

“As well as a lot of other developers, [is] we have challenges with cash and we can’t necessarily look to fund all of the projects we are developing ourselves off our balance sheet,” said Lynch-Williams.

“So there’s been a perfect storm that has resulted in the challenge for us as an organisation having a debt issue that we need to manage over time. The critical thing for renewables is that it doesn’t fundamentally change the principle of our development commitment. It just means we will be looking for partners going forward.”

What this will mean for RWE’s existing project pipeline is an increase in co-investment, rather than a downsizing of capacity installation, Lynch-Williams said.

“The point to make here is that we will always continue to develop projects, but we will just be looking for funding for those projects, potentially to a greater extent than we would have done historically,” she said.

“We have got less cash we will be able to put into the projects in the next two to three years, versus what we said three years ago, but those projects will continue; we will just be looking for other partners.”

When not funding off its balance sheet, RWE Innogy has typically financed projects through co-investment partnerships rather than project debt. For example, it raised 40% of the funding for the 576 MW Gwynt y Mor offshore wind farm off the coast of North Wales from partners including Stadtwerke München GmbH and Siemens AG.

“There’s no change to the activity, all it will mean is that we’ve got less cash available but we’ll be looking to find partners to continue to construct and operates the projects, whether they are wind or hydro plants,” said Lynch-Williams, who stated that RWE could look to raise equity in the next six to nine months for two recently consented Welsh onshore wind farms.

The 48 MW Mynydd y Gwair project and the 84 MW Brechfa Forest West project, which together represent approximately £200 million of investment and a capacity of 130-140 MW, are the most likely upcoming candidates for equity investment in the group’s existing pipeline.

“We are always looking to raise finance,” she said. “We had two onshore projects
RWE will only look to secure co-investors for those projects once the public consultation period comes to a close, and when the company expects to be in a better position to have visibility over its investments.

“[Those projects have] only just got consent,” Lynch-Williams said. “There are always planning conditions we have to manage. There is a statutory requirement, there is an opportunity for them to be challenged, and we have to allow that period to pass. As we move past that point, we will be looking at funding for those projects, dependent on RWE’s cash availability to fund them or not.”

The potential opportunities for equity investment in RWE’s project pipeline are substantial. Lynch-Williams estimates that its existing pipeline could last well into 2020, beyond the UK government’s introduction of the feed-in tariffs with contracts for difference.

RWE may look to both either renew existing partnerships or seek new partners to co-invest on future projects, she added.

“We are always actively looking [for co-investors in projects],” Lynch-Williams said. “We don’t tend to work with developers, because we are a developer ourselves so generally speaking what we’ll do is as projects are consented or as we see a pipeline of projects coming through, we will be looking for investment banks and pension funds.

“There’s a hybrid or combination of options that we are constantly looking at dependent on where we are in a lifecycle, what the market is looking to invest in, or what size of project we are developing.”

Although Lynch-Williams described the market for equity financing as “fairly liquid” at present, she explained that it is difficult to attract pension fund investors to projects at the development stage.

Pension funds may make better refinancing candidates once a portfolio is already built out and developed. RWE co-invests in a series of wind farms through the Zephyr fund, which was set up in 2004 to take ownership of onshore projects.

“The market is fairly liquid but most investors are more comfortable buying into an operational project,” Lynch-Williams said. “Generally speaking, pension funds are more interested in buying into an operational wind farm. Effectively we will do that and potentially recycle cash.”

Source: RWE npower renewables
FRENCH CLEAN POWER PRODUCER TO RAISE EUR450 MILLION FOR GLOBAL PROJECT

Ronan Murphy

France-based renewable power producer Akuo Energy is raising EUR450 million across three funds to support its global project development ambitions, the company’s Chief Executive Officer Eric Scotto told Clean Energy Pipeline.

“The situation today is that we are raising three new vehicles,” said Scotto. “One is dedicated to family offices, the second to pension funds and the third is the Green Energy Island Fund.”

Each fund will target a close of EUR150 million this year. The new funds will cover investments for 2013 through to 2015. Scotto said all three vehicles have secured major sponsors that can provide them with the capital to reach first close.

In the past four years, Akuo has invested EUR1 billion in clean energy projects, EUR200 million of which was equity.

“It is a good moment for these types of vehicles, especially when you have the track record we have,” said Scotto.

The firm is in the process of accelerating its portfolio build-out and will construct 661 MW of capacity in 2013, which represents a further EUR1.2 billion of investment alone, EUR353 million of which will be equity.

The projects to be built by Akuo will mainly consist of wind and solar farms, in addition to one large biomass facility.

“The big difference this year is that Akuo is really going international,” said Scotto. “In the last four years we have mainly been building assets in France. This year is the leap for the group, as we will build much more assets internationally than in France for the first time.”

Akuo operates 410 MW of clean energy capacity in a portfolio dominated by French projects. Once the 661 MW planned for this year is installed, the split between its international and domestic asset-base will be roughly equal. By 2015, 80% of Akuo’s operating assets will be located abroad with France representing just 20%.

The founders of Akuo Energy originally entered the renewable power space in 2003 with a company of a different name, Perfect Wind. In 2006, Perfect Wind sold its entire 600 MW portfolio to Spanish utility Iberdrola for EUR52 million.

The team behind Perfect Wind subsequently formed Akuo Energy in 2008. The firm is primarily focused on wind, but is also active in solar, biomass, hydro and marine energy. It has operations in 13 regions worldwide, including France, Greece, Turkey, the Balkans, Indonesia, Morocco, South America and North America.

It also seeks to develop projects in island regions such as Corsica, Réunion and the French Caribbean.

After forming the new company in 2008, Akuo Energy’s management created Akuo Capital, an asset management firm that raises and operates the funds used by the company to develop its projects. In the past four years, Akuo Capital has successfully tapped institutional investors such as family offices and pension funds to invest in the group’s development vehicles.

Scotto explained that Akuo has taken the path of raising large funds rather than financing on a project-by-project basis due to the scale and diversity of its ambitions.

“We need EUR1 billion of investment per year, which is EUR250 million to EUR300 million of equity per year,” he said. “It is absolutely necessary to be structured, as it is too difficult to [finance] per project with that much activity.”

Despite its drive to internationalise, Akuo Energy still aims to build a significant amount of capacity in France this year. Regulatory volatility in France regarding subsidy cuts and installation caps means there is a lack of clarity on future solar projects, but the company is still in the process of building out 41 MW of capacity that it won in a tender during 2012.

Of that total, 29 MW will complete construction by the end of this year, according to Scotto, who added that the projects will have an energy storage component.

The company’s main focus in France is biomass. It is the largest independent biomass power operator in the country, according to Scotto.

Last year, Akuo Energy closed non-recourse project financing of EUR150 million for two French biomass facilities.

Both biomass plants are cogeneration facilities that provide electricity and heat. One is a 13 MW plant in Estrées-Mons, in the Somme department of France, while the other, named Kogeban, is a 16 MW facility in Nesle, also located in the Somme. Both projects will sell electricity directly to utility EDF, but have agreed separate off-take agreements for their steam output with different agricultural produce companies.

The Estrées-Mons plant has an agreement in place to sell its steam power to processed vegetable producer Bonduelle, which has a factory close by. The project started construction last month.

Kogeban will start operations in April. It will provide steam to another food processing plant, owned by Japanese group Ajinomoto Foods Europe.

Scotto explained that agricultural producers of this kind are preferential to other potential heavy industry off-takers, as there is no danger they will move their factories to a different country.

“It is important to keep your heat and steam customer – that is why we delivered to agro-industry businesses, as that is the kind of company that stays in a country no matter what,” he said.

Akuo Energy won a tender last year to build three more biomass projects with a combined electricity capacity of 52 MW. Scotto said it will carry out full permitting and environmental impact assessments this year before beginning construction of the projects in 2014.
UK OFFSHORE WIND FINANCING SET TO TAKE OFF THIS YEAR, SAYS GREEN INVESTMENT BANK

Ronan Murphy

The UK offshore wind sector is set to be transformed this year by a number of financing deals that will bring much needed new sources of institutional investment to the sector, according to Ian Nolan, Chief Investment Officer of the Green Investment Bank (GIB).

“We think that there is a whole series of transactions now starting to get going in the market and we think that after the end of 2013 we will say this market has come a long way,” he told Clean Energy Pipeline in an interview. “We think there will have been a lot of transactions by the end of the year and a lot of new sources of capital will have entered the sector.”

Nolan disputed claims that the anticipated avoidance of project debt financing by utilities for large UK offshore wind farms makes the £3 billion GIB irrelevant due to its perceived status as a back-up lender.

According to Nolan, the GIB is more than happy to commit equity to offshore wind projects in order to de-risk involvement from institutional players.

“Debt and lower-risk equity would be a description of what we are here to do,” he said. “We do not think the risk profile of un-geared equity is that different from debt.”

He cited the GIB’s participation in post-construction refinancing for institutional consortium OPW’s stake in the Walney 1 offshore wind farm in December, and the bank’s agreement in February to acquire a 24.85% in RWE’s Rhyl Flats offshore wind farm.

Nolan acknowledged that utilities are currently finding it difficult to finance offshore wind farms or sell stakes in them after they have been built, and that any construction financing that does take place is unlikely to be sourced from the typical commercial lenders.

“There is no doubt that there are constraints on utilities’ appetite for Round 3 and new-build projects unless we get more liquidity in the market,” he said.

Addressing this issue is arguably the GIB’s greatest challenge. It aims to resolve the problem by helping to build a viable secondary market in which institutional investors can make the kind of lower risk investment in operational assets that they prefer. This would allow utilities to recycle their capital for use in future offshore wind projects.

“We will be able to attract more capital alongside ourselves if investors believe the secondary market is liquid and functional,” said Nolan, who explained that the GIB is likely to commit the lion’s share of its offshore wind-allocated capital to Round 2 and Round 2.5 projects in order to build this secondary market.

“We are more than happy to take a big share of early transactions which feel unfamiliar [for institutional investors],” he said. “Over time, as familiarity grows, we will be needed less and less. It is important that Round 2 and 2.5 get finished off in terms of financing, so that the existence of the liquidity market is clear for Round 3.”

Under current plans, the GIB is tasked with allocating its entire £3 billion capital capacity by the end of 2015. Nolan is optimistic that the effective deployment of the capital will encourage further funding of the GIB by both the government and private sector investors.

“If we think about where financial markets are these days, one thing institutional investors are definitely looking for is yield, preferably from inflation-linked, long-term assets that match their pension liabilities,” he said. “These things are increasingly difficult to get. If you have an asset it can be understood, and the offshore wind industry is beginning to be successful in products that are attractive to institutional investors.”

Aside from institutional private equity investment, Nolan stated that there are also opportunities to source finance from public equity investment and institutional debt. He said that long-term project finance is going through a transition from being provided by commercial banks to becoming the preserve of institutional lenders, which is another challenge that the offshore wind industry must face.

The main reason for this is that the financial crisis has raised the cost of capital for banks to the point where long-term project finance is becoming economically unviable, which is likely to trigger a retreat of commercial banks from the market.

“Financing long-term assets is costing banks more than what they are getting on the margin, so they want to shrink their project portfolios,” said Nolan. “On reflection, they probably wish they weren’t in project finance at all and they probably want to get out of it.

“We could move to a North American model where long-term finance comes from institutional investors and banks are only involved in short-term construction if at all. We don’t want projects to fail to get finance because the market is in a phase of transition – we are here to provide liquidity to ensure there is not too much pain in the meantime.”

UK Round 3 offshore wind projects must also contend with a regulatory transition from the Renewable Obligations (RO) subsidy to a new system of feed-in tariffs with contracts for difference (CfD). While Nolan conceded that this is another major challenge for the industry, he said financial investors are likely to be more comfortable with the CfD.

“As a generalisation, I think that on balance, financial investors prefer the CfD to the RO, and with utilities it is the other way around,” he said.
OFFSHORE WIND FARM OPERATORS MUST RETAIN STAKES TO EASE INSTITUTIONAL INVESTORS’ FEARS ON RISK

Ronan Murphy

Offshore wind farms can attract institutional investment by ensuring that the utilities that build and operate the projects retain sizeable stakes post-construction to lower risk related to operations and maintenance (O&M), Danish advisory firm Offshore Wind Capital told Clean Energy Pipeline.

The firm’s Chief Commercial Officer Klaus Ravn Andersen, formerly the head of renewable energy asset management for Danish utility DONG Energy, emphasised that institutional investors potentially acquiring offshore wind farms post-construction need greater assurance on O&M because of their lack of knowledge of the sector. He believes the only way they can ensure some measure of control over O&M risk is to give the wind farm operator a stake in the project.

“If you are an institutional investor, all of them would like to make an offshore wind farm a financial deal, something where the only thing they need to care about is the cash return on it, but that’s not the way you own offshore wind,” he said.

“The tricky thing is the O&M part. You have to evaluate your maintenance strategy. For an institutional investor it is nice to have an experienced operator to do the O&M, and that might be the company that originally constructed the park.

“Maybe 10% ownership would be sufficient for the operator, but you need to have the operator with some kind of ownership in the park. The danger in the eyes of most investors is, ‘will it last?’.

In reality, yes it will last because this is not new technology. It is old-fashioned technology used in a new way.”

Offshore Wind Capital specialises in providing advice to institutional investors such as pension funds and infrastructure funds that could potentially invest equity in offshore wind farms. The firm sees large utilities with experience of building wind farms as the most viable investment partners for institutional participants.

The firm’s Chief Executive Officer Torben Kjaergaard said: “Our model is that we want our investors to invest with utilities.

We’re not looking at the little independent power producers in Germany and we’re not looking at funding. We’re looking at coming in with the big utilities and have major investors buy maybe 70-80% of a project, but let the utility do what they’re best at, and that’s run the project.”

Offshore Wind Capital characterises its role as identifying all the various areas of risk for an institutional investor that, when analysed and priced, can be resolved through financial solutions. Such issues include O&M, turbine and foundation quality, and quality of wind resources.

Kjaergaard stated that the degree to which institutional players need education on the offshore wind sector is frequently underestimated by the industry.

“All the pension funds have one guy who is Mr. Alternative, who is supposed to take care of all investments that are not bonds or shares,” he said.

“That guy cannot cover offshore wind. Infrastructure funds are diversified, so they can’t really specialise in offshore wind. The amounts needed are too huge, so if they can take a little bite in one or two projects, that is as far they are ever going to get.”

Offshore Wind Capital aims to not only educate the investment managers of institutional investors, but to break through antipathy to offshore wind from the board members of these firms.

Kjaergaard said: “We have a funny track record, as 100% of investors we’ve sat across from, their investment officer has asked the board to invest. The boards said no. I call it the ‘old man syndrome’.

“These are board members who are very uneducated in renewables and in energy, because they’re generalists – it’s not a criticism of them, it’s just something that is happening. They say, ‘why do we need wind’ instead of seeing the need for an energy mix.”

The two main markets for Offshore Wind Capital are Germany and the UK. Both markets face different issues limiting their offshore wind ambitions, as Kjaergaard outlined in a UK-focused interview last week.

In Germany, while the feed-in tariff remains an attractive subsidy on which to base offshore wind investments, Kjaergaard cautioned that recently announced subsidy cuts will feel retroactive to wind farms that are in the latter stages of development after being initiated six to seven years ago on the promise of more favourable support for offshore wind power.
ENZYMES DEVELOPER TO INVEST IN FACTORY EXPANSION AS CELLULOSIC ETHANOL DEMAND GROWS

Jessica Mills-Davies

Denmark-based enzyme developer Novozymes plans to increase enzyme production capacity in the next 5-10 years to meet rapid anticipated growth in demand for cellulosic ethanol, the company’s Vice President for Bioenergy Poul Ruben told Clean Energy Pipeline.

“As demand will grow and increase we will continue to invest in production capacity,” said Ruben. “It will be significant expansion, with seven new factories in different parts of the world. We do believe this is something we can fund by our own balance sheet.”

With an average enzyme production plant costing in the region of Eur200 million, Novozymes is looking at making a considerable investment.

The biotechnology company’s next capacity investment will be in Brazil, where a thriving sugarcane industry generates a wealth of surplus sugarcane bagasse, Ruben said.

“For the initial start we have sufficient capacity in the US and China, whereas Brazil – even though we have a [small] factory there – is probably where we will build our next factory,” he said. “Then we will expand as demand ramps up.”

The major advantage of cellulosic ethanol is that it does not directly compete with food crops, and is able instead to draw on waste cellulosic biomass feedstock, but production has thus far been restricted to just a handful of companies.

The US Environmental Protection Agency (EPA) was instructed by a federal court in January to reduce the mandate for cellulosic fuel production in 2012 in light of the product’s limited availability.

Despite the court’s conclusion that the EPA had overestimated the amount of cellulosic biofuel available for sale last year, Ruben said the US cellulosic ethanol market could start to ramp up as early as next year.

“It’s quite usual that new technologies take longer to introduce to commercial scale and it’s no surprise we’ve been lagging a bit behind the Renewable Fuel Standard in the US,” said Ruben. “We think the ramp up is going to start happening in 2014/15 in the US and 2015 in China with the Chinese government’s plan. In Brazil, we also guess it will be 2014/15 before we see the ramp-up. By 2015, we expect to see 15-20 cellulosic ethanol plants globally.”

Chinese company Shengquan opened the world’s first commercial waste-to-cellulosic ethanol plant last year using Novozymes’ technology, giving China an edge in the race for production of the fuel. China is expected to launch nine more cellulosic ethanol plants in the next couple of years, while Brazil is on track to launch its first cellulosic ethanol plant over the next 12 months. Several plants are planned for development in the US and Italy.

China’s investment in cellulosic biofuel is largely government-, rather than enterprise-driven, and Novozymes expects the country to continue to be at the forefront of the initial build-out in the industry.

“China is one of the hotspots,” said Ruben. “In addition to the first plant, a number of other plants are coming up. The Chinese government has plans for nine [cellulosic ethanol plants] to be built over the next two years – by 2015 – with 500,000 tonnes of ethanol capacity. The plan is to increase capacity tenfold by 2020 to five million tonnes per year, or 10% of its gasoline consumption.”

Novozymes already operates seven enzyme factories globally, including two in the US, one in Brazil and two in China and although bioenergy accounts for just 16% of its business, it claims to hold 60% of the global bioenergy enzyme market.

Ruben expects the cellulosic ethanol industry to significantly ramp up in the next 5-10 years. He said lowering the cost of biofuel enzymes will be critical to this transition, as was the case with corn ethanol production. Novozymes’ R&D investment will be particularly targeted at boosting volume production and making its enzymes more efficient.

“What used to be the main cost component was the enzyme, which used to be more than half the cost,” said Ruben. “We’ve been working with partners on cellulosic ethanol enzymes in the past five years, and made the breakthrough of making the cost so low that you can produce it at a cost comparable to corn ethanol. Back five years, the cost was two to five times higher, now it is comparable to corn ethanol, which today retails at 20% cheaper than coal or conventional gasoline.”

Growth in the corn ethanol industry is expected to slow in the next three to four years, with larger leaps to be made in cellulosic ethanol, but the jury is still out as to whether cellulosic ethanol will eventually become the cheaper option, and as to which cellulosic feedstocks will prevail.

“We believe corn ethanol is here to stay, in our view it is viable and sound, we believe it will stay and you will see cellulosic ethanol co-exist,” said Ruben. “From a feedstock point of view, corn is a commodity that is traded, so it’s easier, whereas cellulosic materials vary a lot so the markets have to be established.”

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VENTURE CAPITAL

GARAGE TECHNOLOGY VENTURES TO EXPLOIT CORPORATE MARKET FOR CLEANTECH INVESTMENT

Rob Lavine

Venture capital (VC) firm Garage Technology Ventures intends to leverage the support of corporate partners to move towards a new cleantech investment model, Managing Director Bill Reichert told Clean Energy Pipeline.

Garage launched a new fund in December that will collaborate with corporate partners to seek new VC investment opportunities in cleantech, including the material science, advanced chemistry and general energy tech sectors. Garage has mainly worked with institutional investors as limited partners in the past, but has shifted direction in response to increased interest by corporates in strategic VC investments in recent years.

“The opportunity came up when we were approached by a number of different corporations that are interested in getting their fingers deeper into the emerging innovation ecosystem out here on the West coast,” Reichert explained. “What we found was that a number of companies that are involved globally in various industries still have a high need for innovation in the cleantech sector.

“The intent is, rather than the corporation building out its capability to reach into all these different corners of the innovation ecosystem, they are partnering with us to extend their reach and we are investing their money in these early-stage companies that meet their strategic criteria.”

Garage aims to leverage $20-40 million of funding per year through the fund, investing between $500,000 and $5 million per transaction for a stake between 10% and 40% in early-stage, growth-stage and safe-stage companies. The firm will act as manager for the investments, but the capital will be put up solely by corporates.

Although their identities are known to the portfolio companies, the corporates are participating in stealth mode until they have completed their own internal strategic investment plans. Reichert revealed that there has been more interest from the industrial and energy tech side than the green IT sector, most likely because corporate venturing units in IT companies tend to be more established and have already forged relationships in the sector.

“Most all of our discussions involve the corporate venture capital unit for the partners, and the issue in each case is how large and how well developed and experienced that unit is,” he said.

“In each case the reason we’re having the discussion or signed up [to] the partnership is because the corporate venture capital unit is relatively new, and so in the case of the guys we’re working with on the cleantech side, their corporate venture capital units are both less than two years old and so they’re in the process of building them out. They’re using the partnership with Garage as a means of accelerating the development of that capability.”

Because the fund is still new, and is partly dependent on external corporate processes, it is starting relatively slowly, but Reichert maintains that there are plenty of interesting investment opportunities in the broader landscape.

“The target is 6 to 8 [investments per year] – it could be less, it could be more,” he said. “We’re definitely off to a slow start so it’s unlikely we’re going to hit the 6-8 mark in the first year, but that’s the speed that we want to invest. Then what will happen is there will be some follow-on investments, and so that will be consuming additional chunks of capital included in the $20-40 million budget.”

The fund’s strategy is to stay largely sector neutral and it will not exclude depressed sectors such as biofuels or solar, Reichert said.

“[Solar] is a highly depressed sector right now, at least in terms of the perception of it as an investible area, but there’s no question – there are interesting
next-generation technologies that are coming down the path [and] that are going to have the potential to be big wealth generators."

Reichart has prior experience in solar investment, having been a board member of Miasolé, the thin-film solar cell producer recently acquired by China-based Hanergy at a massive write-down on its fundraising value, but he stated that Garage was the only backer to emerge from the wreckage in profit.

“As one of the first guys who touched Miasolé, we were in very early,” he said. “We had the opportunity during the boom years, when the price got bid way up, to take our bid off the table at an extraordinary multiple as the company was raising money, as it was oversubscribed in its exuberant rounds.”

Despite Garage exiting at the right time, Reichart cited the VC investment climate, which is increasingly based around hype cycles of ever decreasing length, as the reason why VC firms have backed off cleantech to some degree.

However, he said the current environment presents an opportunity for Garage’s new fund, particularly as the firm has returned positive cash-on-cash from cleantech to investors in the past, and that the corporate link is a boon.

“An added virtue of having a corporate partner is that corporate partners are not intimidated by the challenge of scaling out new technologies,” Reichart explained. “It’s what they do, and so the difference in attacking the cleantech market opportunity with a corporate partner versus depending on financial institutions is that corporate partners have much greater patience and much greater understanding of the time cycles, capital requirements and the scale required to build out these companies.

“We are never going to be the smartest guys on the planet in terms of any specific technology, and that’s true for any venture capital fund. So we have to be the smartest guys on the planet about something else. In our case it is about what it takes to launch a company: to take a new technology, commercialise it, build a team around it and penetrate a market.

“That’s a different kind of challenge than most corporate executives are trained to handle so that’s how we are complimentary in working with corporate partners.”

“We have a number of projects in the pipeline that did stall during the last year, but these are beginning to pick up again,” he said. “We expect to be in a position to close the first of these in the first quarter of next year.”

The RO banding review finalised the incentive for advanced waste-gasification technology at 2 ROCs per megawatt-hour (MWh) for projects commissioned in 2013/2014, falling to 1.9 ROCs in 2014/2015 and 1.8 ROCs in 2015/16. Because of the delay, APP’s first plants will now be built with the 1.9 ROCs subsidy.

A typical plant using APP’s proprietary scalable GasPlasma process will be capable of converting 150,000-170,000 tonnes per year of residual, commercial or industrial waste to 90,000-100,000 tonnes of refuse-derived fuel able to produce 17 MW of electricity and 23 MW of heat. The capital cost of each project is about £65 per tonne, which translates to a total capex of £65 million for a 100,000-tonne plant.

Consequently, APP is still in the process of raising an equity fund it announced last year to finance multiple projects. It appointed a large investment bank to advise on the process and has already secured a portion of the capital.

“Throughout the third and fourth quarters of last year and now into the first quarter this year, we have had numerous meetings with equity providers in particular, but also with debt providers; and we’re seeing a good level of appetite in the market for equity,” said Stein.
Aside from financial investors, APP has also been working with strategic players and secured interest from power off-takers, engineering, procurement and construction (EPC) contractors and waste companies, which could all take equity positions in the company’s projects.

APP aims to finance its projects at a 50:50 debt-to-equity ratio, which means they are leveraged far less than the usual 70:30 debt-equity model for a clean energy asset.

“It is obviously a challenging climate and environment to be raising money in full stop,” said Stein. “The fact that we will be building a first-of-a-kind commercial facility has its challenges as well.

“My central thesis is that our technology offers improved levels of return that, even when de-risked through a very rigid contracting structure, still represents a fundable proposition.”

De-risking contracts to ensure they are bankable levies extra costs on a project through measures such as extensive EPC performance wraps and agreeing power off-take agreements for 10 years or more.

Longer-term power off-take contracts in particular incur extra costs in potential lost revenue over the lifespan of a project because the rising price of electricity means the plant could theoretically realise greater revenues through selling power on the spot market in years to come.

However, with new technology such as advanced gasification, banks need long-term power and waste supply contracts in place to feel secure in lending to the project. The same principle holds true for waste supply contracts.

Stein is confident that APP’s projects can offer the kind of returns in the mid-to-high teens necessary to ensure they are viable investments. This is doubly important given that availability of debt is low.

APP aims to finance its projects at a 50:50 debt-to-equity ratio, which means they are leveraged far less than the usual 70:30 debt-equity model for a clean energy asset. While the availability of debt finance for advanced waste-energy is not high, Stein believes there are enough lenders to support APP’s ambitions.

“There are some UK banks still in the business,” he said. “The community of senior debt providers for project finance has definitely shrunk significantly but there are Asian banks, Japanese banks and some Western European banks.”

In addition to its UK projects, APP is also making progress on plans to license its technology to international developers in other markets. It aims to provide engineering design in addition to key components, and could close its first international engineering orders within “a couple” of months, according to Stein.

The progress of these overseas orders will influence whether APP needs to raise more capital at the corporate level. The delay on UK projects has forced the company to service overhead costs for 10-12 months longer than it would have preferred, but Stein could not definitively say whether further funding for operations will be required.

Source: Clean Energy Pipeline / VB/Research Ltd.
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Eco2 has a third UK project that it plans to develop at Mendlesham in Suffolk. The plant, which is an identical size and design to its two predecessors, will likely be the last of this kind that Eco2 develops in the UK due to the government’s imposition in December 2012 of a 400 MW cap on new dedicated biomass capacity, though the opportunity for development on behalf of third parties still exists.

“The cap means it is almost certain that the UK will be done for dedicated biomass,” said Williams. “We are looking at CHP qualifications and the third project could be modified to CHP.”

Beyond the UK, Eco2 has wider ambitions for its project portfolio. It has two fully consented projects identical to Sleaford in Spain, which Williams said is poised to stimulate biomass development, potentially through a new tariff subsidy.

He stated that the 7% tax Spain introduced on all energy production last year does not represent an insurmountable barrier for Eco2’s projects, especially if the potential new tariff offsets the impact of the tax.

Williams acknowledged that Spain’s track record of retroactive cuts to clean energy subsidies means that foreign lenders are unlikely to risk financing biomass projects there, but pointed out that Spanish banks are capable of supporting the sector.

“External lenders are more likely to be dissuaded by retroactive cuts, but Spanish lenders have to support the local market,” he said. “For project finance, we would look at an external equity investor with international banks, or a balance sheet investor. We are talking to a couple of different organisations that would fit the bill.”

The third major market for Eco2 in Europe is Romania, where it has three biomass plants in the planning stages. The company is currently working to get these projects consented and hopes to finance the first one in 2014.
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UK POWER PRODUCER COULD EXPAND INVESTMENT POT TO FINANCE £200 MILLION MEXICAN BIOGAS PLANT

Jessica Mills-Davies

UK-based renewable energy project developer and financier ENER-G Holdings plc may extend its investment facilities to finance the construction of a £200 million landfill recovery plant in Mexico, the company’s Director of Anaerobic Digestion Development Scott Tamplin told Clean Energy Pipeline.

ENER-G established ENER-G Mexico last year as an embedded entity to develop biogas and other renewable energy projects in the country.

The biggest opportunity for renewable energy development in Mexico is landfill gas recovery as the country has large volumes of uncovered landfill sites with unchecked methane emissions that could be converted into renewable power.

ENER-G completed Mexico’s first landfill gas recovery plant in April 2012 at the San Nicholas landfill in partnership with the city of Aquascalientes and has developed close relationships with several municipalities in the country, according to Tamplin.

“We are looking to do a lot of biogas and renewable energy projects in Mexico,” he said. “The turnover of [the Mexican business] is quite small at the moment, but there are massive opportunities in Mexico with landfill recovery because they have been utilising landfill operations for decades. There are large numbers of existing landfills with no biogas recovery systems on them.”

ENER-G is in negotiations to secure a 30 MW landfill recovery deal in Mexico for a project that could enter construction in early 2014, Tamplin said. The plant is expected to take five years to build and will require a total investment of approximately £200 million.

“The finance aligned for the ENERG group is a group-wide pot,” Tamplin said. “We would need to extend the pot if we got the 30 MW deal, because it would be a £200 million investment.”

Tamplin confirmed that ENER-G could turn to existing investors to help finance the Mexican plant by extending its existing funding pool demarcated for renewable energy projects.

ENER-G has a finance package in place with unnamed investment banks that it uses to fund renewable energy projects. The company invests on average about £15-20 million in projects each year, which Tamplin said is typically less than the total funds available to the company.

“We have some of our own funds from some investment banks that [are] secured for renewable energy projects,” said Tamplin. “It’s a sizeable fund for investing in a number of renewable energy projects. If we were to draw down on that fund, we could probably develop 20 anaerobic digestion systems in a year with the funds that are available. [The funds] are committed and ring-fenced and secured purely for us.”

Although Tamplin did not disclose the investors that provided funding for its finance pot, he said the main investor is a well-known, “reputable” high street bank. In January 2012, ENER-G secured £30 million in debt financing from Barclays Corporate to support its international expansion plans, including a £15 million term loan and a revolving credit facility of equal volume, Manchester Evening News reported.

ENER-G’s key selling point is that it funds the cost of renewable energy projects and completes the planning, permitting, electrical connection, design and technology installation on behalf of clients. It utilises a build, own and operate model, where clients can take ownership of plants at the end of 10-15-year contracts.

The company aims to address the finance vacuum for small to medium enterprises where projects are too expensive to finance off balance sheet but are too large a ticket for high street banks and too small a ticket for investment banks.

“We can remove the finance vacuum, we can add all our skills and expertise into developing the projects,” said Tamplin. “When Europe changes and the finance world starts to improve and people are more entrepreneurial with their investments, I expect the finance barrier will start to ease and more people will invest in these types of renewable energy projects.”

Tamplin said ENER-G’s existing investors are keen for the company to invest more in the development of renewable energy projects both in the UK and globally across Africa, Europe and Latin America through its distributed subsidiaries.

“We have got more outside finance trying to push us by giving us funds available to commit and develop more,” said Tamplin. “We do want to see anaerobic digestion take off in the UK. As well as what we’ve got going on in the UK and Mexico, we have got some overseas interests in developing landfill operations in South Africa, Poland and Hungary.”

[Image]
Energy Storage

Xtreme Power Seeks International Partners as It Expands Grid-Scale Storage Solutions

Rob Lavine

Grid-scale battery producer Xtreme Power intends to scale up the size of its energy storage systems, but sees the market for grid-scale storage as being mainly restricted to small-scale in the near future, Vice President Ryan O'Keefe told Clean Energy Pipeline.

Founded in Texas in 2004, Xtreme designs and manufactures battery-based power management systems that have been primarily used in utility-scale wind and solar systems to date. However, the company recently completed a 36 MW system for Duke Energy’s 153-MW Notrees wind farm in west Texas, helping to take Xtreme’s overall installed storage capacity to 77 MW.

“I would love to do more 30 to 50 MW-scale projects,” said O’Keefe. “I think that there is a market for that but it will be in development for a bit more time.

“The current size and scale of projects we’re looking at now range from 4-6 MW up to 10-15 MW, and that’s driven mostly by the host application, which in most cases right now is island renewable integration or fast-response frequency regulation. We don’t see an awful lot of imminent demand for 50+ MW-scale systems, but I do think there are applications where that size hits a sweet spot, and those will be in development over the next several years to maybe [the next] decade."

O’Keefe said that Xtreme has attracted interest from renewable energy EPC (engineering, procurement and construction) specialists, but is still advancing from the “first date phase into the courtship phase,” and is yet to form a longer-term partnership with an EPC provider.

“I think that people will see the value,” he said. “Maybe not for every project, but the EPC guys are familiar with us and know what we can do. There might be opportunities for certain projects where they can suggest to their customers how to enhance the value proposition of the project overall - I see that as a really important sales channel for us in the upcoming years.”

The expansion of grid-scale storage is likely to be more feasible in Europe than the US, O’Keefe stated, since the vast size of the three main US grids makes it easier for them to deal with the intermittency of renewables, which make up a relatively small proportion of the network.

“As you move to Europe, wind gets connected in much smaller increments,” O’Keefe explained. “A typical wind farm in Germany or France for example might be 5 MW or 4 MW, not 400 MW like in the US. The grids are still very strong, but they’re smaller. So if you look to Germany, you start seeing a higher percentage of renewables on the grid in smaller, more distributed chunks.”

At that point, because the peak generation periods for wind in particular do not always match up with peak consumption times, and areas with a high concentration of renewables like Germany or California could potentially be overloaded by an especially sunny or windy day, it makes sense to use grid-scale storage as a buffer. Alternatively, it can be more profitable to sell energy at peak times than in off-peak periods.

Xtreme Power plans to raise a Series D round later this year to add to more than $90 million of venture capital funding already raised, but ultimately Xtreme is at present still a small company.

“There’s an economic equation there where a renewable wind developer may invest in a storage system merely to sell his generation at higher prices or prevent curtailment of his asset,” said O’Keefe.

“We’re starting to see the economics of those scenarios look very attractive for today’s storage prices, but as storage [costs] decline, I think the economics will be even more attractive in coming years. On islands, the economics are there today.”

Xtreme is in talks with prospective partners for European ventures and expects to seal its first delivery deals there this year, O’Keefe revealed. The company’s other main route for expansion is through island grids, and it has already installed several systems in Hawaii.

The firm’s biggest success story so far, the executive said, is a 3 MW system on Kodiak Island in Alaska, which has all but eliminated the need for diesel generators to back up the island’s wind and hydro power plants.

“Most of the islands of the world run on diesel,” O’Keefe said. “So diesel costs are out of control, and as a result electricity prices on some of these islands are five times or more what they are on mainland US, or even in Europe.”

Xtreme Power plans to raise a Series D round later this year to add to more than $90 million of venture capital funding already raised, but ultimately Xtreme is at present still a small company, and relies on partnerships with other businesses, particularly larger battery companies with bigger resources, as the quickest route to increase its revenues.

For instance, a joint development deal agreed recently with Samsung SDI was cited by O’Keefe as “really important” for the company, partly due to Samsung’s ability to market Xtreme’s technology in Asia. Xtreme will need to show that its systems can be cost-competitive without subsidies and will continue to refine its technology, but the right partners can help accelerate that process.

“I think we’re going to grow throughout North America with our direct sales force going to market in the islands – in the Caribbean, in the Pacific – through our existing utility contact networks and our existing sales force,” he said. “If you look beyond that, at places like Southeast Asia and the kazillion islands there, or microgrids in South America, we just don’t have the reach to touch those places directly.

“So we have world class, big-name battery partners that can bring those customers to us and manage those relationships. We’ve got commercial trading partners that are interested in those markets, that are looking to deploy this technology from an investment perspective, and they can bring those kinds of deals to us.”
FOCUS OF ARPA-E SHIFTS FROM ENERGY STORAGE TO GREEN TRANSPORTATION

Rob Lavine

When Advanced Research Projects Agency-Energy (ARPA-E), the initiative launched by the United States government to fund growth of high-impact energy technologies, revealed in late February that companies it has funded have now raised more than $450 million in private sector follow-on investment, it was apt that the announcement came just after Fluidic Energy, an energy storage company granted $5 million in ARPA-E funds in 2009, had just raised a $13.8 million round.

Fluidic Energy, which develops metal-air battery technology, is typical of the kind of start-up that has been funded by ARPA-E over the last four years. Set up in 2009 to identify and support cutting edge technology able to meet the US’s energy challenges, ARPA-E has funded more than 275 businesses and academic projects through its periodic Funding Opportunity Announcements (FOAs).

The FOAs have focused on several sectors of energy technology, including energy efficiency (BEETIT), carbon capture (IMPACCT) and solar power (Solar ADEPT), but energy storage has so far been the most significant recipient, with four programmes – BEEST, GRIDS, HEATS and AMPED – contributing a combined $136.5 million to businesses and academic projects.

BEEST awarded grants to six battery companies in 2010, including Sion Power, which subsequently raised $50 million in venture funding in 2011, as well as Polyplus and 24M, which have since raised $19 million between them. GRIDS, initiated the same year, funded grid-scale storage companies including Fluidic, General Compression and Primus Power.

HEATS, launched in 2011, concentrated on thermal energy storage, but its funds were primarily allocated to university-based projects and larger corporations, a pattern duplicated by 2012’s AMPED, which aimed to fund advanced energy storage management technology.

It is perhaps also notable that HESM, the department’s planned hybrid energy storage programme for 2012, was shifted across departments to the Office of Naval Research, which has also emerged as a significant buyer in the biofuels sector over recent years, indicating a shift away from commercialising the technology in the mass market and towards a mass state-backed buyer like the military.

The most recent ARPA-E programme is the Robust Affordable Next Generation EV-Storage (RANGE) programme, announced in February, which will allocate up to $20 million for technology related to energy storage in electric vehicles (EVs). RANGE provides the ideal picture of where ARPA-E is right now in that it incorporates both its past, in the form of energy storage, and its future, which is set to concentrate more highly on green transport.

ARPA-E’s budget application for 2013, which is currently in appropriation, has requested $325 million for funding, up from $255 million in 2012. Of that total, $184.3 million has been specifically earmarked for transportation systems, a 29% rise from the previous year, and more than three times the amount spent in 2011.

ARPA-E has designated funding for EVs in the past under initiatives such as its 2010 Electrofuels programme and 2011
Plants Engineered to Replace Oil (PETRO), which together allocated $85.6 million to 23 projects researching alternative fuel sources for transportation.

Grants have also been given out under ARPA-E’s two Open Funding Solicitations, in 2009 and 2012, and through last year’s MOVE programme, which targeted natural gas as a possible fuel source for transportation.

However, 2013 appears to signal a leap in funding for these kinds of schemes, and ARPA-E’s budget submission specifies that it is prioritising advanced manufacturing and vehicles research and development.

ARPA-E said that it chiefly plans to explore “game-changing” battery technologies for hybrid and plug-in electric vehicles that can break the 300 miles driving range barrier while also providing sufficient power for acceleration. Other initiatives which could be explored in 2013 include the possible re-opening of the Electrofuels FOA, renewable methane fuel solutions and storage for transportation systems.

The 2013 budgetary request notes that there are precise challenges related to focusing on transportation, namely the long life of vehicle fleets and the slow adoption of technology in the sector, which means that any improvements in transportation efficiency can take a long time to make an impact. In addition, new technology must be rigorously tested, which takes more time, and patterns of use are historically slow to change.

The department also has an issue with commercialisation. As the MIT Technology Review has pointed out, ARPA-E’s model was based on that of the Defense Advanced Research Projects Agency (DARPA) where the US military gains from any advances. With no interconnected, technology-reliant state-backed infrastructure for ARPA-E’s businesses to supply, it is questionable how much effect the grants can ultimately have for start-ups once the research period concludes.

Cheryl Martin, Deputy Director of ARPA-E and head of its Technology-to-Market programme, is trying to overcome that problem by requiring recipients to contact prospective business partners to help bring technology to market. In the green transportation sector, that is most likely to be conventional automakers or, for green fuel alternatives, petrol companies.

However, the biggest danger to ARPA-E’s activities could well be sequestration, which came into effect on March 1 this year and which is set to indiscriminately cut $85 billion from the US’s annual budget. The legislation which brought in ARPA-E is set to expire at the end of 2013, and departing Energy Secretary Steven Chu has already warned that the cuts could lead to the programme being scaled back.

During his speech at the ARPA-E Summit at the end of last month, Chu maintained that there is bipartisan support for the department in Congress, but bipartisan support for anything at all in US politics has been thin on the ground recently. ARPA-E’s future from 2014 remains uncertain, but should it get its way on the 2013 budget, it will hopefully be able to provide a springboard for early-stage companies in the green transportation industry in particular.
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› Samsung, Pattern secure financing for 270 MW Ontario wind farm
› Cape Wind names Bank of Tokyo Mitsubishi lead arranger for project debt financing
› E.ON Climate & Renewables secures $174.9 million for Indiana wind farm
› Enel Green Power secures $100 million financing for Chilean wind portfolio
› OPIC provides $288 million in financing for wind farms in Pakistan and Peru
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Public Markets
› Greencoat Capital raises £260 million from flotation of UK wind fund
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› EAM Solar raises $19 million through Norway IPO
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› OneRoof to acquire $100 million of residential solar projects
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› China raises 2013 wind and solar targets by 10 GW
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› European Commission takes Poland, Cyprus to court over failure to introduce renewables laws
› India to launch 750 MW second phase of national solar mission by May
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› DOE considers nine new loan guarantees worth $4.8 billion
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› India targets 15 GW of wind energy generation in 12th five-year plan
› Indonesia to introduce solar feed-in tariff
› US Department of the Interior approves 1.1 GW of solar, wind projects
› UK to issue renewable energy project contracts based on CFD this year
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- **Electric Vehicles Conference**
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- **REFF Latin America & Caribbean***
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**May 2013**

- **World Biomass Power Markets May**
  15th May - 17th May 2013
  Amsterdam, Netherlands

- **The Maghreb Renewable Energy Congress: Solar Maghreb 2013, Wind Maghreb 2013**
  21st May - 22nd May 2013
  Rabat, Morocco

- **All-Energy 2013**
  22nd May - 23rd May 2013
  Aberdeen, UK

- **GeoPower Finance & Investment**
  28th May - 30th May 2013
  San Francisco, CA, USA

- **MIREC 2013: Solar Power Mexico 2013, Wind Power Mexico 2013**
  29th May - 30th May 2013
  Mexico City, Mexico

**June 2013**

- **Renewable Energy World Europe**
  4th June - 6th June 2013
  Vienna, Austria

- **21st European Biomass Conference and Exhibition**
  3rd June - 7th June 2013
  Copenhagen, Denmark

- **TBLI Conference USA 2013**
  17th June - 18th June 2013
  New York, NY, USA

- **World GeoPower Markets Indonesia & Philippines**
  18th June - 19th June 2013
  Jakarta, Indonesia

- **Global Wind Power Finance & Risk**
  19th June - 20th June 2013
  London, United Kingdom

- **Optimising Wind Power O&M: Europe**
  19th June - 20th June 2013
  London, United Kingdom

**July 2013**

- **GeoPower Africa 2013**
  16th July - 17th July 2013
  Dar es Salaam, Tanzania

**September 2013**

- **Solar Power Indaba**
  2nd September - 5th September 2013
  Cape Town, South Africa

- **Optimising Wind Power O&M: Europe**
  3rd September - 4th September 2013
  Manchester, UK

- **REFF Europe***
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  London, UK

*events where someone from our team is either speaking, moderating a panel or Clean Energy Pipeline is a Research Partner

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