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About the report

This sector report was edited by Andre Johnston of the Mergers Alliance central team. To compile our findings we conducted interviews with our sector experts from each member firm within the Mergers Alliance partnership. We also surveyed owners and senior executives within cleantech sector organisations and private equity investors worldwide.

For more information on this report please contact Andre Johnston, Mergers Alliance Research Manager.

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Deal Focus

Within each country’s Deal Focus we review merger and acquisition (M&A) activity, focusing on key deals and trends within the cleantech sector. Cleantech is a shortened form of clean technologies. We define cleantech as those activities relating to renewable power generation: Wind farms, solar, hydro, waste to energy, geothermal, biogas, biomass and tidal. Our report also includes transactions relating to energy efficiency and resource management: Recycling, air & environment management, energy infrastructure, water treatment / conservation. We have included tables of recent transactions where the target company is located in the country under review.

Additionally, we provide an overview of the cleantech sector as a whole, highlighting the market structure as well as commenting on the key trends and the factors influencing M&A. We provide our own insight on how we think the market might play out over the coming 18 months and attempt to identify key investment opportunities. We also provide a summary of two government policies from each country that we believe has, or will, influence M&A activity in cleantech.

Key terminology: PV (Photovoltaic), GW (Gigawatt), MW (Megawatt), KW (Kilowatt), Mwh (Megawatt hour), kWh (Kilowatt hour)

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Introduction

Whilst the major economies of the world continue to navigate a difficult credit environment and weaker growth prospects, the cleantech industry remains somewhat unique in that it continues to develop strongly in almost all countries. As you will see from our sector experts across the world whilst each country may be at different points in their development trajectory, prospects in almost all are compelling.

This development is being driven by the need for governments to tackle climate change on a multi-lateral basis and ensure security of energy supply for their populations and industries over the long term. Legislation and attractive fiscal incentives are key to much of the recent growth and in most countries these levers will drive investment for decades to come.

You will find in our report a great deal of market-leading insight into the key issues facing the sector in 2011 and beyond: how the industry needs to operate on a global basis, why geographical comparative strengths are focusing investment in each country and how broad state initiatives and targets are ensuring that transactions get done. Our work also highlights the key developments in different cleantech sectors and how this is shaping the M&A strategies of mid-cap companies, global corporates and the private equity industry alike.

As the global recovery takes hold, we at Mergers Alliance are ideally placed to help you. Whether you seek growth through acquisition, wish to restructure or realise value in your business, our international advisors are in a unique position to help you. Our member firms have a prominent position in boardrooms across the world and are renowned for delivering award winning partner-led advisory service with seamless international cooperation.

We hope you enjoy reading our report and welcome any thoughts or additions you might like to contribute.

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We at Mergers Alliance believe the main factors to shape M&A in the cleantech sector over the next three years will be:

The “globality” of cleantech

The deployment of technology and capital (both corporate and institutional) in cleantech has had a distinctly international flavour since the industry’s inception. Nonetheless, there has been a slight reduction in cross-border activity over the past 18 months which can be largely attributed to ongoing global economic concerns and contracting government support. This trend should reverse as balance sheets strengthen and as investors start looking for targets in developing economies with strong macro fundamentals and robust support mechanisms. We expect interest to stretch beyond the BRIC countries to include nascent cleantech markets with high-growth potential such as South Africa and Poland.

Countries to capitalise on their comparative advantage

Each country will capitalise on their comparative natural strengths; the UK with offshore wind, South Africa with solar, Sweden with biomass. Equally, countries such as the Netherlands with its water industry and Germany and Japan with their manufacturing capabilities will be looking to entrench and further develop their respective competitive advantages.

Scope of private equity interest broad

Unlike in many industries, private equity investors have been involved across the whole financing cycle from pre-revenue venture finance, through traditional MBO’s, to investing into large-scale generating assets. It should be noted that there was a slight increase in investments into more mature businesses which have clearer paths to exit.

Our research shows that PE/VC investment in 2010 increased by 19% compared to 2009 and 2011 is set to achieve similar growth numbers. We expect this number to continue to increase over the coming years due to the emergence of a growing number of specialist PE funds that focus exclusively on cleantech. Interestingly within PE circles, the definition of cleantech has been broadened to include sectors such as water, waste management and industrial process efficiency.

Government targets impacting cleantech

Renewable targets are driving cleantech sector development. One of the more sweeping initiatives is the EU’s 20-20-20 directive. It mandates a change in energy consumption and efficiency habits and for renewables to constitute 20% of energy generation by 2020. China’s Renewable Energy Law aims for 15% renewable energy usage by 2020. South Africa, whose domestic cleantech industry is currently almost nonexistent, is targeting an ambitious 37% by 2030. Such initiatives will underpin investment decisions and help ensure deals get completed, even in the face of global economic uncertainty.

Specific policies having direct affect on M&A

Certain legislative and fiscal policies are directly affecting the volume of M&A transactions. The National Biodiesel Program in Brazil, which mandates a 5% biodiesel blend in diesel, has triggered a number of deals, the recently implemented feed-in-tariffs in the UK was the catalyst behind some of the most notable transactions in the UK. Conversely, regressive policies have also been the driving force behind a string of deals; the reductions in photovoltaic subsidies in Italy being a good case in point.

We should see a new round of incentives, particularly from countries with healthy current account surpluses, as they attempt to emerge from the renewables arms race endowed with a healthy green portfolio.

The impact of Fukushima

The nuclear renaissance has seemingly slowed as a result of the Great East Japan earthquake creating conditions for the meltdown of nuclear reactors in Fukushima. It is clear now that Fukushima has had a substantive effect on the policies of both governments and energy conglomerates. The biggest news was arguably Germany’s decision to shut down all of its nuclear power plants by 2022. Just weeks after the Japan earthquake nuclear energy giant EDF bought out the remaining shares it does not already own of its renewable energy subsidiary EDF Energies Nouvelles; a possible indication that the disaster is influencing corporate decision making.
Sector focus

Solar's future uncertain

In Europe the solar industry is facing somewhat of a mini-crisis due to increased competition from Asia, overcapacity and a significant reduction in government support. This is especially apparent in Italy, Spain, France and Germany. We expect heightened M&A activity as European companies look to expand their geographical reach in an effort to maintain the same growth they have become accustomed to domestically. M&A in the solar sector was characterised by three factors:

- Overcapacity and market saturation has led firms, who are looking to lock in higher margins, to focus on improving efficiency, specifically through materials innovation and light management technologies.
- A decrease in state support, mostly in Europe, has diminished the business viability of many solar players. Reduced feed-in-tariffs in particular have caused financial difficulties for smaller firms. There was a marked increase in major solar firms entering non-EU markets.
- Cash heavy Asian firms acquiring foreign companies as they aim to achieve technological autonomy as well as technological parity.

Wind energy: The surge continues

The past 18 months saw a record number of M&A transactions in wind. Importantly, there was a decline in the average purchase price of running wind plants. This was partially due to project developers disposing of their already built wind farms to secure capital to finance their future/current wind developments.

Installations grew in all the major markets, albeit at a more modest pace compared to 2009. China experienced the largest growth (48% of the new total wind installations over the past year took place in China). The UK lead the way in offshore installations thanks to multi-billion dollar investments into the sector. We expect Germany and China to also emerge as important bastions of offshore wind over the coming years.

Chinese wind turbine firms are emerging to become highly competitive across the globe thanks to improving technology and lower overheads. It is now home to four of the world's top ten wind turbine firms. Nonetheless, we expect European turbine players to continue to excel internationally especially in regions such as Latin America where they can leverage their financial resources and industry experience.

Waste management transforms

We expect investment flow into the waste management industry to accelerate which should result in a rise in M&A activity. Market optimism in this sector can be attributed to the increasing attractiveness of vertical integration, legislative and fiscal incentives and the push for ever rising recycling rates in developed nations. Consolidation is driving M&A in the more traditional collection and processing sectors which includes acquiring advanced material recycling facilities (MRF's). Investment is also being channelled into energy from waste whether advanced thermal plants or anaerobic digestion.

Certain cleantech sectors viable without state support

Thanks to reduced costs, innovation and logistical maneuvering, a number of sub-sectors in certain countries have emerged to become economically viable without the helping hand of government. These include wind power in Brazil, re-refining in the USA and the water treatment industry across a number of regions.
Mergers Alliance partners highlight some interesting observations.

**France**
M&A volumes in biomass will increase as both large strategic buyers and industry newcomers look to capitalise on the new tax on polluting rates.

**USA**
Even without state support the biofuel re-refining sub-sector has seen a number of deals take place. Improving green technology will make this space even more attractive.

**Spain**
After buying out its renewable arm, Iberdrola Renovables SA is expected to move towards diversifying its renewable portfolio, both domestically and abroad.

**Mexico**
Spanish based firm Iberdrola Renovables SA has been actively buying up Mexican wind, lifting its total capacity in the country to 106 MW.

**Germany**
International firms have been actively buying German solar firms. We expect this trend to continue as foreign companies seek access to premium German technology.

**Brazil**
Expect to see prominent Ethanol players Cosan, ETH, Bunge and Guarani to start looking for global M&A opportunities.

**South Africa**
IPP program launched Aug 2011. Large renewable energy players Renewable Energy Systems, Mainstream Renewable Power and Suntech Power Holdings have entered the market.

**UK**
The rise in landfill taxes and recycling targets continues to stimulate M&A activity by overseas and domestic buyers in the waste sector.
Italy
The auspicious new state energy efficiency scheme should prove to be highly beneficial for domestic firms.

Japan
Japan is reassessing its energy provision, which is still highly dependent on foreign oil. Japanese corporations are looking to increase their exposure to international markets.

Turkey
The considerable wind potential in Turkey has yet to be fully realised. The US$1.1bn purchase of a portfolio of Turkish wind farm power projects by UK based Renewable Energy Systems may prove to be an indicator of things to come.

Netherlands
A strong private equity tradition is manifesting itself in the cleantech industry with a number of firms setting aside funds aimed at the renewable segments.

Russia
Russian energy giants Inter Rao UES and Rushydro are expanding their geographical reach to include Vietnam, Georgia and Armenia.

China
The government’s decision to repeal legislation that required that 70% of the components used to build a wind turbine are domestically produced should encourage fresh foreign investment into the wind sector.

India
The merchant power market in India should attract renewable firms seeking more flexibility in their energy generating operations.

Norway
Norway’s Statoil and France’s Technip have partnered to build large capacity floating wind turbines. Stronger offshore winds should offset increased installation and infrastructure costs.

Poland
Reforms in government legislation will create better conditions in the Polish wind sector, which is expected to grow almost threefold by 2015.
“While consolidation in the ethanol sector dominated cleantech activity over the past several years, and with more still to come, M&A transactions involving large wind players are beginning to occur, as independent players become large enough to attract strategic acquirers or in order to gain more scale in the face of challenging IPO prospects.”

Derek Gallo, Broadspan

Macro growth driving clean tech M&A

Brazilian GDP growth remains strong, at 7.4% in 2010 and 4.1% expected for 2011, which has encouraged consolidation and also attracted international strategic investors seeking high growth markets. The need for investment in energy generation to produce this growth has attracted foreign operators and investors with experience in the renewable energy sectors. Relatively high interest rates leave many smaller companies vulnerable to larger players endowed with both lower costs of capital and the corporate guarantees required during construction in project finance structures.

The cleantech industry in Brazil has historically been dominated by biofuel, specifically ethanol and more recently a growing biodiesel programme, as well as renewable generation which includes hydro and more recently biomass (e.g. sugar cane cogeneration) and onshore wind farms. Hydro represents 68% of installed capacity and 87% of the electric energy generation in the country.

Renewable energy generation and biofuels are expanding at a rapid pace, driven by Brazil’s economic growth and the success of government programmes that have pushed for the proliferation of biodiesel and wind. Although the ethanol sector has experienced a lot of consolidation in recent times, the market is still relatively fragmented so expert further consolidation. Wind energy, which accounts for 0.5% of the electric generation, is predicted to reach 4.3% by 2013. Biomass energy, including sugarcane residues, wood and charcoal, represents around 30% of the country’s energy matrix.

M&A activity settling after expansive growth

M&A activity in the Brazilian cleantech market boomed in 2009 and although there was a slight contraction in 2010, total volume and average deal value has remained fairly constant over the past four years. In April 2011 local integrated player CPFL Energia acquired financial investor-backed Jantus SL for US$960m. The deal involved four wind farms with a 210 MW wind farm project and a portfolio of 732 MW certified projects that are eligible for participation in the energy auctions. CPFL is now in talks with ERSA, a large independent player that is backed by various private equity funds and banks.

In the middle market, Brazilian private equity firm Stratus acquired a 40% stake in Amyris Brasil, a unit of US-based Amyris Biotechnologies for US$54m. Stratus’ strategy is to support Amyris’ plans to transform sugarcane into renewable feedstock, at an industrial scale, for the domestic production of chemicals by 2014.

The National Biodiesel Program, which mandates a 5% biodiesel blend in diesel, was the impetus behind a number of M&A deals. For example, the merger of Brasil Ecodiesel and a Spanish owned agribusiness firm demonstrated the attraction of a vertically integrated production model. Petrobras also strengthened its position in the sector with the acquisition of a 50% stake in a greenfield biodiesel plant. By and large, however, most of the recent M&A activity emanated from the ethanol sector, accounting for about half of all deals.

M&A activity

Source: Capital IQ, Mergermarket
**Market forces drive wind expansion**

A number of the smaller firms that have developed wind farms have lacked the balance sheet strength needed to obtain long term financing from BNDES (Brazilian Development Bank), forcing them to sell to larger players. Furthermore, the emergence of medium sized independent players has attracted attention from the larger strategic companies requiring scale to enter the segment.

Even without any tariff subsidies, Brazil has huge potential for wind energy usage as capacity factors range from 36-55%. Importantly, the 2004 PROINFA subsidies -see inset- are no longer necessary as construction costs have come down to approximately US$2.5m per MW. The fact that the market alone can sustain the Brazilian wind sector has alerted investors looking for viable business propositions.

**Biodiesel: An industry waiting for government support**

Despite a spate of recent deals, the biodiesel sector will likely remain somewhat stagnant until the government releases a new regulatory framework elevating the minimum share of biodiesel in the diesel blend. Independent producers might be sold to players with crushing facilities and agricultural operations to guarantee a steady supply of oil.

**Cross-border opportunities in wind and ethanol**

Although there are a handful of dedicated private equity and venture capital funds that have invested in recycling, biomass generation, and water treatment, there is still a distinct lack of involvement in the market. The solar thermal and energy efficiency sub-sectors have still not fully matured, mainly due to the high cost of capital in Brazil. Wind and ethanol will continue to dominate the M&A landscape.

Due to their prominence in the ethanol industry look for Brazilian firms such as Cosan, ETH, Guarani or Bunge to begin searching for opportunities abroad whilst we also expect to see an inflow of M&A in the Brazilian wind space.

**Recent transactions**

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<tr>
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<th>Description</th>
<th>Acquirer</th>
<th>Deal Value (US$m)</th>
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<tr>
<td>Apr 11</td>
<td>Jantus SL</td>
<td>Wind farms</td>
<td>CPFL</td>
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<tr>
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<td>Wind / small hydro / biomass</td>
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<td>Sep 10</td>
<td>Omega Energia</td>
<td>Small Hydro Plants</td>
<td>Warburg Pincus and Tarpon</td>
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<td>Aug 10</td>
<td>Biooleo Industrial</td>
<td>Biodiesel</td>
<td>Petrobras Biocombustiveis</td>
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<td>Amyris Brasil</td>
<td>Celulosecanol</td>
<td>Stratus</td>
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<td>Ethanol</td>
<td>ETH Bioenergia</td>
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<td>Santelisa Bioenergia</td>
<td>Sugar / Ethanol</td>
<td>Louis Dreyfus Commodities</td>
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<td>Aug 09</td>
<td>Energimp</td>
<td>Wind Farms</td>
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**Government support**

**PROINFA:**

- The Incentive Program for Alternative Energy Sources, otherwise known as the PROINFA Programme, was promulgated in 2002 to stimulate renewable energy generation by providing government (through Eletrobras) Power Purchase Agreements.
- The sector that benefited the most was the wind energy sector, which jumped from 22 to 414 MW of installed capacity from 2002 to 2007.
- Because the programme has been targeted at small independent producers who do not have the financial strength to secure long term financing from local development banks, many of the recipients have been forced to sell their projects to larger players therefore stimulating overall M&A activity.

**National Biodiesel Program:**

- The programme requires the mandatory use of a biodiesel blend in diesel. It started with a 2% blend in 2008, which increased to 4% in July 2009 and then to 5% in January 2010. There are plans to reach a 20% mandatory blend in 2020. The programme has been the driver behind a number of M&A deals.
Diminishing oil reserves driving cleantech

Mexican GDP grew at 5.5% in 2010, its fastest rate of growth for ten years. A sharp rise in manufacturing was the main attributing factor. Despite fast growth, inflation has actually dropped to 3.8%, down from 4.4% in 2010. Growth, however, is putting a strain on energy requirements.

One of the most important macroeconomic drivers of Mexican cleantech in recent years has been Mexico’s dwindling oil reserves. Oil reserves have fallen nearly 50% since 2000. Although the state has made attempts to finesse its way out of its reliance on fossil fuels and nuclear energy, the renewables industry has been relatively slow to get off the ground. Despite this, industry analysts look upon Mexico’s cleantech potential with great sanguinity. In a regulatory and institutional context, Mexico is much more favourable to M&A in renewable energy than it was just two years ago.

Spanish interest

Total volume in cleantech has been relatively low over the past 18 months. Underlying this has been the monopolised ownership of the electricity sector as well as the reduced government support in the industry up until recently. The bulk of the deals completed have been in wind power.

In early 2011 Spanish based firm Iberdrola Renovables’ SA purchased the Mexican Bill Nee Stipa wind farm from Gamsea Corporación Tecnológica. This was Iberdrola Renvables’s second operational wind farm purchase in Mexico, lifting its overall capacity to 106 MW. The deal was in line with Iberdrola’s strategy of extending its Latin American coverage and establishing growth in countries with increasingly favourable regulatory frameworks.

In late 2010 Spanish oil and gas giants Repsol joined forces with one of Mexico’s biggest conglomerates KUO to establish KUOSOL, a company dedicated to the production of bio-energy. The new company will be headquartered in Mexico and its main operations will be the industrial scale cultivation of the jatropha plant. It is hoped that the biofuel crop will generate 16 MW per year for consumption.
Large foreign involvement in wind power

Mexico has the potential to equal, if not surpass Brazil as the dominant wind player in Latin America. The logistical demands of such an endeavour will mean progress will be gradual. Nonetheless, in the short term we expect escalating government support mechanisms to encourage foreign players.

In July 2011 Canon Power Group, a US based renewable energy firm, announced its intention to invest US$2.5bn into the Mexican wind market. The sizable investment will comprise of three wind farms located in Zacatecas, Baja California and Quintana Roo for a combined power output of 312 MW and will bring total installed wind capacity in Mexico to over 1 GW.

Siemens made its first foray into the Latin American wind market by supplying 70 wind turbines to Mexican wind power firm Grupo Soluciones en Energias Renovables. The turbines will be installed in the Tamaulipas region of Mexico and will supply over 160 MW. The cost of the order totalled US$70m and marked one the largest investments by a Mexican firm into the wind energy market to date.

Small-scale moves into solar

There has not been much interest in solar to date, primarily due to the prohibitively high costs of solar panels relative to other technologies. No major large-scale projects are planned; however companies such as Abengoa, a Spanish conglomerate with significant operations in renewable energy, are starting to make incremental encroachments into the Mexican photovoltaic (PV) space. This is certainly a sub-sector waiting to be exploited by foreign firms that possess lower costs of production, especially considering Mexico has the third largest solar potential in the world.

The industry waits for firmer government intervention

Although policies, initiatives and subsidies have progressed over recent years, the state still offers more monetary and legislative support to the fossil fuel industries. The aforementioned dwindling oils reserves should reverse this over time. We expect M&A in cleantech to increase once the synergy between what the market can offer and what the state can offer reaches a suitable equilibrium.
Cleantech marches on

The US cleantech market continues to defy gravity with a potentially record setting year in store. Although political and economic storm clouds loom, most sectors within cleantech have seen robust investment activity. Cleantech transaction volumes in the United States for H1 2011 increased by 25.9% on a pro-rata basis. This growth, plus the 16.9% jump in average deal values, illustrates the improving outlook in the industry.

Renewable energy is quickly becoming a factor in the overall US power generation stack. For the first time, renewable electricity production within the US is greater than nuclear power production by 5.6%.

Multiple deals in upward trending solar sector

Four of the five largest project fundings that occurred in 2010 were made in the US, including; HSBC and BNP Paribas’ loan to Abengoa Solar’s CSP plant and NRG Solar’s investment in Sunpower’s 250 MW project. Assuming government support does not follow in the footsteps of European markets there is no reason to believe that this growth will not continue in the US.

The US also led the world in solar venture capital investment in Q2 2011, having invested 78.2% of the US$353.5m invested globally. Improving technology for solar manufacturers is increasingly valuable as the industry struggles to rapidly decrease costs. The first round of price reductions in the solar industry stemmed from outsourcing to developing countries, vertically integrating, and streamlining manufacturing. With most of these achievable gains realised, the solar industry is keenly focused on improving efficiency through technological advances.

One particularly interesting technology investment was DuPont’s recent purchase of Innovalight. Innovalight produces silicon ink for printing onto multi crystalline panels to increase panel efficiency by 1-2%. This acquisition highlights an emerging thesis within the industry that manufacturing efficiency gains are approaching diminishing returns. Solar manufacturers now must begin to look at materials innovation and light management technologies.

Political compromise should safeguard cleantech

While the cleantech industry is expanding and valuations are increasing, trouble is brewing. Budget deficits are causing the public to plead for a balanced budget, and cleantech earmarks may fall victim to cost cutting efforts. Without government incentives, cleantech growth will slow. However, these incentives may be able to avoid the chopping block for two reasons: First, the incentives are indirectly funded, and second, there is substantial state level involvement. Tax code incentives such as Production...
Tax Credits (“PTCs”) -see inset- should be safeguarded because Republicans have been focused on reducing government spending rather than on increasing taxes.

Wind power growth slows

Wind power installations continue to grow, albeit the pace is slowing to a 40.3% growth rate. Projects that are being financed all have pertinent agreements with investment grade credit entities. These agreements include the power purchase agreement (“PPA”), engineer, procure, construct (“EPC”) contract, and long-term O&M agreement. PPAs continue to be the most elusive. The intermittent power generation which occurs primarily during non-peak hours reduces utility demand for the projects.

In M&A markets, acquisitions are occurring at 8.5% to 9% unleveraged after-tax yields. These yields are slightly higher than solar projects because wind power debt is more expensive due to the higher variability in production. For example, Northwestern Energy, an investor owned utility, agreed to purchase a 40 MW Compass Wind project for US$77.8m, or US$1.95m per MW.

Investors take note of the waste oil sector

Out of the fever for green investment opportunities comes the resurgence of the waste oil re-refining industry; a process that takes used lubricant oil and re-refines it into virgin-quality base oil for reuse. Re-refining has been around since the mid 1900s but the processes were often as dirty as the waste oil itself. Today, green technological improvements combined with increasing demand for sustainable products have propelled the re-refining industry to new levels.

The sub-sector is active with multiple deals despite the absence of government incentives. Heritage Crystal Clean obtained a US$20m construction financing from Bank of America to start construction on its 1,950 barrel per day plant. Further, the sale of the 1,000 barrel per day Heartland Oil plant to Warren Distribution provides the lubricant blender a steady supply of high quality lubricant that is increasingly in demand from eco-friendly consumers. Not only is this a green industry, but it is also quite profitable for re-refiners without the need for government subsidies.

Recent transactions

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<thead>
<tr>
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<td>Jul 11</td>
<td>InnovaLight Silicon Ink Solar Technology</td>
<td>DuPont</td>
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<td>Apr 11</td>
<td>Compass Wind 40 MW Wind Farm</td>
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<td>CH Energy Group 19 MW New York State Biomass Plant</td>
<td>ReEnergy</td>
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<td>Lincoln Renewable Energy 10 MW Solar Project in New Jersey</td>
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<tr>
<td>Apr 11</td>
<td>Primestar Solar Thin Film Solar Technology</td>
<td>General Electric</td>
<td>n/d</td>
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<td>Mar 11</td>
<td>Heritage Crystal Clean 1,950 Barrel per Day Waste Oil Re-refinery</td>
<td>Bank of America</td>
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<td>Feb 11</td>
<td>Bowersock Mills &amp; Power Company Hydropower</td>
<td>RGA and Waddell &amp; Reed</td>
<td>24</td>
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<tr>
<td>Nov 10</td>
<td>Mt Poso Cogeneration Biomass Fuel</td>
<td>OTE Energy Services</td>
<td>40</td>
<td></td>
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<tr>
<td>Sep 10</td>
<td>Marubeni Sustainable Biomass Operator</td>
<td>Korea East-West Power (South Korea)</td>
<td>44</td>
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</tr>
</tbody>
</table>

Government support

Federal Production Tax Credit (PTC)
- The PTC is a per kWh tax credit for electricity generated by stipulated energy sources. The rates are US$0.022 kWh for utility scale wind, solar, geothermal, closed-loop biomass and US$0.011 kWh for hydropower, open-loop biomass, landfill gas and marine renewables.
- Originally initiated in 1992, the federal PTC has been revised and expanded several times since.

Renewable Energy Certificates (REC’s)
- The REC’s mandate typically requires 20-25% of a state’s energy to be generated from renewable sources.
- State REC’s will drive up cleantech demand, especially as they ratchet up as the 2020 and 2025 deadlines draw near. So far 29 states have adopted REC’s.
“Chinese cleantech firms, as with their conventional manufacturing counterparts in the past, have recognised the need to partake in technology transfer through M&A if they want to deliver the best and most cost effective products to their local customers.”

Zachary Tsai, Catalyst Corporate Finance

Macro strength protects cleantech industry

China managed to emerge from the global economic downturn almost unscathed as overall growth continued unabated throughout the cycle. Unlike many Western economies, China’s economic robustness meant the cleantech sector was relatively insulated from external pressures. With its vast foreign reserves the Chinese have the monetary capacity to truly allow the renewable industries to continue to drive its industrial expansion whilst reducing its reliance on conventional forms of energy.

Indeed, China’s investment into cleantech has come on leaps and bounds over the past several years, catching many Western observers by surprise. It has now reached a point where it has become a global leader across certain sub-sectors of renewable energy with regards to production and installations of PV and wind.

Large and mid-market deals evident

Mid-market deals in solar and wastewater treatment made up most of the M&A over the past three years. Recent deals included the purchase of Jinzhou Huachang Photovoltaic Technology, a Chinese based manufacturer of silicon solar cells, by Solargiga Energy Holdings, a Hong Kong based firm engaged in the production of silicon solar wafers, for US$208m.

GCL-Poly Energy Holdings Limited acquired China based polysilicon producer and one of the world’s leading solar wafer suppliers Jiangsu Zhongeng Technology Development for US$3.4bn in what was one of the largest cleantech deals of 2009.

Opportunities for investors in the established wind sector

2010 saw China surpass the US to become the world’s largest wind energy producers. Their total output now stands at 43 GW compared to 40 GW of the United States. It has been projected that it will rise sharply again by the end of 2011 to 55 GW

This rapid expansion has been largely due to generous government subsidies and China’s panoptic approach to renewable installations. Moreover, vast coastlines and an accommodating climate, along with lower costs of capital goods, gives China a distinct comparative advantage in the wind power game. It is now home to four of the top ten wind turbine firms in the world in terms of market volume: Sinovel, Goldwind, Dongfang and United Power.

Interestingly for investors, state legislation that required that 70% of the components used to build a wind turbine are domestically produced has been repealed. This was done to attract more foreign investment and technological know-how to the wind turbine industry. Accordingly, this should be a good opportunity for international firms to begin engaging in M&A more aggressively to secure some of the lucrative Chinese wind market.

M&A activity

Source: Mergermarket, Corpfin
Technological spillover

Chinese firms are not shying away from using their financial clout to appropriate foreign technological expertise. Elkem, a Norwegian firm heavily involved in solar technology, was acquired by China’s National Bluestar for US$2bn. This should provide National Bluestar with the technology spillover necessary to effectively compete in the PV market. The magnitude of this deal was another indicator that Chinese firms are seeking technology internalisation in the cleantech sector. Look for outbound M&A to continue to be influenced along these lines.

Warren Buffet invests in the Chinese green car market

In 2008 American multibillionaire investor Warren Buffet acquired a US$232m stake in Chinese rechargeable battery firm BYD Co. The Chinese firm’s main appeal to Buffet is its electric car subsidiary BYD Automobile and the development of automotive battery technologies. Buffet’s 10% stake illustrates the attractiveness of investing into the world’s largest car market and what will be (if predictions hold) the world’s largest manufacturers of electric cars by 2019.

Key features to look out for

Looking ahead, one of the major challenges facing China’s cleantech industry is the shortage of capacity in its grid system. Connectivity issues between renewable energy production and the end user have not been resolved. As mentioned, China leads the way in total installed wind capacity, however, only 73% of installed capacity is grid connected.

This could be an opening for tech savvy foreign firms to tap into this section of the market to help alleviate the disconnect. Although the state will assist in distributing new smart grid technologies, the market should look to lessen and indeed capitalise on the inevitable lag between need and implementation through the deployment and use of better technology and more cost effective measures.

China should remain a compelling target for inbound M&A, especially in wind power. With wind making up only 1.18% of total energy generation those looking to outpace the already speedy Chinese economy could do worse than breaking into this burgeoning sector.

Recent transactions

<table>
<thead>
<tr>
<th>Date</th>
<th>Target</th>
<th>Description</th>
<th>Acquirer</th>
<th>Deal Value (US$m)</th>
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<tbody>
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<td>July 11</td>
<td>Shunda Holdings</td>
<td>Renewable energy developer</td>
<td>Furbon Life Insurance (Taiwan)</td>
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<td>Jun 11</td>
<td>Changzhou Ying Light and Power</td>
<td>Silicon crystal rod manufacture</td>
<td>Haitong Food Group (Hong Kong)</td>
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<td>May 11</td>
<td>Golden Idea Bio-Engineering</td>
<td>Wastewater</td>
<td>Sino Kingdom Intl Investments</td>
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<tr>
<td>Jan 11</td>
<td>Giga-World Industry Solar/Wind</td>
<td>Tech Pro Technology (Hong Kong)</td>
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<tr>
<td>Jan 11</td>
<td>Wanxiang Electric Energy efficiency</td>
<td>Enert1, Inc. (USA)</td>
<td>n/d</td>
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<tr>
<td>Nov 10</td>
<td>Jinhzhou Huachang Silicon solar cells</td>
<td>Solargiga Energy (Hong Kong)</td>
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<tr>
<td>Sep 10</td>
<td>GE Energy (Shenyang) Wind energy</td>
<td>Harbin Electric Machinery</td>
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<td>Aug 10</td>
<td>Hanwha SolarOn Solar</td>
<td>Hanwha Chemical (South Korea)</td>
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<td>Feb 10</td>
<td>JD Holdings Inc Clean technology service provider</td>
<td>Northern Light Venture Capital (USA)</td>
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<td>Jun 09</td>
<td>Wu Ling Power Corporation Hydro</td>
<td>China Power Intl (Hong Kong)</td>
<td>653</td>
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</tr>
</tbody>
</table>

Government support

Renewable Energy Law

The 2005 Renewable Energy Law is an all encompassing legislative act designed to ensure the steady development of renewable energy, to protect the environment and to guarantee a certain amount of energy autonomy.

Underpinning the law is to have renewable energy constitute 15% of its total energy generation output. Its framework includes feed-in-tariffs and a cost sharing scheme that flattens the cost of electricity generation.

The 2005 law was updated in early 2010 to include further provisions in an effort to resolve teething problems that arose during China’s cleantech proliferation.

The Golden Sun Initiative

In 2009 Chinese policy makers rolled out a 50% subsidy on solar projects above 500 MW. The Golden Sun initiative will subsidise half the building costs which includes initial grid connection and general energy distribution infrastructure.

There has been an increase in Chinese solar investment although M&A in this sub-sector has not been particularly impacted. The initiative is expected to end in 2012-13.
Economy in transition

Economic reforms over two decades have helped India become one of the world’s largest and fastest growing economies. Integration into the global economy and the ongoing liberalisation of India’s regulatory and legislative frameworks have enabled M&A activity to flourish over the last few years and has attracted a number of foreign cleantech players into the market.

Globally, India is currently placed fifth in total renewable capacity. Excluding large hydro, India’s installed capacity of renewable energy stands at 18.7 GW and accounts for 11% of total capacity. Although wind is currently far and away the biggest renewable contributor (11 GW), solar energy is being heavily advocated by the state and a target of 20 GW of total installed capacity by 2022 has been set to meet its growing energy demands. Ultimately, policy makers aim to have renewables constitute 30% of total electricity capacity in addition to large-scale hydro by 2032.

Large private equity involvement

Transaction volumes in cleantech have continued along the same upward trajectory for a number of years now. Indian transaction volumes are up heavily on a pro-rata basis for the current year.

Private equity investments, both domestic and foreign, have played a large role in helping grow the Indian cleantech industry. In January 2011 US based private equity players Argonaut Ventures, New Silk Route and Bessemer Ventures acquired a majority stake in solar power company Kiran Energy Solar for US$50m. Kiran has several power purchase agreements (PPA) already in place; a 20 MW PPA with Gujarat Urja Vikas Nigam and a 5 MW PPA under the 20 GW Solar Mission state target. The investment will help Kiran achieve its goal of owning a portfolio totalling 200 MW capacity in three years.

There has been a large amount of domestic private equity directed at the water industries. India Value Fund Advisors agreed to invest US$19.3m in UEM India, a company that provides water/wastewater treatment and disposal services to the New Delhi locality. Peepul Capital agreed to acquire an undisclosed stake in Chennai based Aqua Designs India. Both transactions will allow the companies to diversify and increase the scale of their water operations.

M&A activity

Source: Mergermarket, VC Circle
M&A strategies

Cleantech deals usually follow two patterns; either strategically acquiring to adopt new business models (renewable power plants, component construction) or acquiring to procure new technologies. The majority of deals fall into the former category, especially from private equity firms who have typically invested in companies that are fundamentally sound and have positive EBITDA. Early stage pre-revenue start-ups, offering an innovative concept tend to be less attractive.

India’s USP

One of the most unique aspects about Indian renewable energy is the existence of a lively merchant power market. Unlike conventional power plants, that are built and operated by a regulated utility body (designed to serve the customer), merchant power plants are funded by investors and any electricity generated is traded on an energy spot market. Plants are therefore not tied down to long term contracts.

Tariffs are determined purely by market forces rather than through PPA’s. Total merchant capacity is expected to be 23 GW by 2015. Ultimately, through this process, barriers to entering the power generation industry in India are reduced relative to other developing countries.

Opportunities in water

Water and wastewater recycling facilitates are increasingly under pressure to keep up with growing demand. Domestically manufactured equipment tends to be cheaper than imported equivalents. What local firms lack are the design technologies and industry expertise to develop larger scale wastewater treatment plants.

To bridge the gap, Indian policy makers have amended foreign direct investment legislation to allow 100% investment into local wastewater treatment plants. This is an opportunity for companies with the requisite technical aptitude to enter the market worth an estimated US$4bn and growing at 15% annually.

Recent transactions

<table>
<thead>
<tr>
<th>Date</th>
<th>Target</th>
<th>Description</th>
<th>Acquirer</th>
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<td>May 11</td>
<td>Gondwana Wastewater Ltd.</td>
<td>Wastewater treatment</td>
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<td>Mar 11</td>
<td>NSL Renewable Power</td>
<td>Renewable energy projects</td>
<td>International Finance Corp (USA)</td>
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<td>Jan 11</td>
<td>Kiran Energy Solar Power</td>
<td>Development of photovoltaic</td>
<td>New Silk Route Bessener (USA)</td>
<td>50</td>
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<tr>
<td>Jan 11</td>
<td>Clearwater Ltd.</td>
<td>Wastewater treatment</td>
<td>Technofab Engineering Ltd.</td>
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<td>Dec 10</td>
<td>Titan Energy</td>
<td>Solar PV</td>
<td>IFCI Venture</td>
<td>6.8</td>
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<td>Oct 10</td>
<td>Auro Mira Energy</td>
<td>Renewable - Hydro, Biomass</td>
<td>Aureos South Asia Fund</td>
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<td>Aug 10</td>
<td>Moser Baer Projects</td>
<td>Solar PV</td>
<td>Blackstone Group (USA)</td>
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<td>Jul 10</td>
<td>UEM India</td>
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<td>Jun 10</td>
<td>Nanoda Energy Limited</td>
<td>Biomass power plant</td>
<td>Clenergen Corporation (USA)</td>
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<tr>
<td>Jan 10</td>
<td>DLF Wind Power</td>
<td>Wind power</td>
<td>GDF Suez SA (France)</td>
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</tbody>
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Government support

State Electricity Regulatory Commissions Mandates

In 2003 the various State Electricity Regulatory Commissions (SERC’s) were mandated to promote renewable energy. The SERC’s are autonomous, statutory commissions. As of 2009, all the states in India except Arunachal Pradesh, Nagaland and Sikkim have a SERC.

- The principle SERC provision to date has been the renewable purchase obligations initiative. It requires distribution companies to source up to 10% of their power from renewables.
- Other SERC provisions include feed-in-tariffs and fiscal incentives, such as accelerated depreciation, and tax breaks/holidays.

Solar Generation Based Incentive

In 2008 the Ministry of New and Renewable Energy (MNRE) launched a generation based incentive. The subsidy scheme provides a generation based incentive of 12 rupees (US$0.28) for electricity generated from Solar PV and 10 rupees (US$0.23) for electricity generated from solar thermal.

- A capacity cap of 10 MW is placed on each state and a maximum capacity of 5 MW per developer. The electricity is sold to state-owned utilities. The fiscal incentive will run until 2018.
“Japanese corporations will look to acquire overseas companies to accelerate the development of new low cost renewable energy technologies for Japan and its global markets.”

Owen Hultman, IBS Yamaichi Securities

Deal malaise

Domestic deal activity and average deal value involving local targets in cleantech has seen a year on year decline since 2009 as both mid-size and large Japanese companies shift their strategic focus to overseas markets, especially Asia and the BRICS but also the traditional markets of Europe and North America. A number of factors are driving this trend including the attraction of high growth markets in the developing world and shrinking domestic demand due to a declining and ageing population in Japan.

The vast majority of the deals have been domestic such as IDEX Co’s acquisition of Shinsei, a solar power generation services company, and the sale of clean energy distributor Windtech Tahara to Electric Power Dvlp.

Seeking international exposure

Japanese trading companies are actively seeking renewable energy-independent power production opportunities abroad. Itochu, Marubeni, Sojitz, Mitsubishi, and Sumitomo are all investing in solar and wind farms in Europe and the Americas as well as the developers and systems integrators of these renewable energy projects.

Recently, Mitsubishi acquired an equity stake in the Spanish solar thermal energy company Acciona Thermosolar SL. Sharp, a major developer and manufacturer of solar panels, is also interested in acquiring solar farms in order to expand the scope

of its solar business and recently acquired Recurrent Energy, a US based solar energy independent power producer and developer of solar farms.

Nuclear will continue to play an important role

About 96% of the energy resources supplied in Japan are imported from abroad with oil accounting for 47% of total supply, down from 77% in 1973. In order to reduce its high dependence on foreign energy sources and fossil fuels (84% of supply) the Japanese government and corporations have made increasing efforts to develop renewable energy resources and energy efficient technologies.

Japan is the third largest player in nuclear power behind the US and France with 53 nuclear plants. Despite the disaster of the Great East Japan earthquake creating conditions for the meltdown of nuclear reactors in Fukushima, nuclear power will continue to be an important source of energy for Japan, generating about 26% of the supply of electricity.

M&A activity

Source: Mergermarket, Corpfin

Total deal volume

Average deal value $m

Transaction volume

Average deal value $m

2008 2009 2010 H1 2011

Capital City: Tokyo
Area: 377,944 sq km
Population: 127,420,000
Time zone: GMT +9
Expertise across the sub-sectors

The Japanese electronics industry was an early entrant to the solar energy sector and remains a global player in the production of solar panels and equipment with Sharp, Kyocera, Panasonic/Sanyo, Mitsubishi and Kaneka all being major suppliers of PV solar panels.

While Japan may not be the lowest cost manufacturer of solar PV panels, Japanese companies are leading the development of new technologies and materials to boost the efficiency of solar cells.

Chemical companies such as Kaneka, Kuraray, Mitsubishi Chemical and Asahi Kasei are actively developing new materials for solar panel films and encapsulants and as such we expect Japan to continue to hold a large influence on new solar PV technologies.

Energy management and smart grids are segments in which Japanese corporations are becoming stronger through M&A (Toshiba/Landis Gyr AG). Indeed, one area the Fukushima shutdown did highlight was the pressing need to invest in efficient energy management.

In transportation, Toyota and Nissan have made major developments in the commercialisation of hybrid gas and electric auto engines using nickel-metal hydride and lithium-ion battery technology from Panasonic and GS Yuasa.

Changing shape of the Japanese cleantech industry

The Japanese government is developing new regulations and policies as they attempt to successfully navigate this precarious post earthquake period. We expect the more favourable government policies to stimulate cleantech M&A over the medium term especially in solar.

In the private sector, Japanese corporations are, with the assistance of government, taking action to accelerate the development of renewable energy sources and energy efficient technologies by investing in cleantech energy related businesses both domestically and abroad.

The rationale for deals by Japanese acquirers is technology transfer, lower cost overseas production and global distribution. Japanese companies will be targeting a broad range of investments from new breakthrough technologies in equipment and materials to the steady long-term income from investments in independent power producers.

Recent transactions

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<thead>
<tr>
<th>Date</th>
<th>Target</th>
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<th>Acquirer</th>
<th>Deal Value (US$m)</th>
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<td>Shinsei Solar power generation panels</td>
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<td>Kokuho System Photovoltaic construction</td>
<td>Vitec Co</td>
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<td>Mar 11</td>
<td>Yamanaka EP Solar, optical fiber construction</td>
<td>Ceradyne (USA)</td>
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<td>Feb 11</td>
<td>First Energy Service Energy conservation services</td>
<td>Nihon Techno Co</td>
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<td>Dec 10</td>
<td>Ecosystem Japan Solar energy installation services</td>
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<td>Sep 10</td>
<td>Torishima Pump Wind power</td>
<td>Konica Minolta</td>
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<td>Ishii Hyoki Co Solar battery wafers</td>
<td>Excel Solar Battery Wafer</td>
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<td>May 10</td>
<td>Zephyr Corp Wind-solar and water power</td>
<td>INCJ</td>
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<td>Mar 10</td>
<td>Excel Inc-Solar Battery Solar battery wafers</td>
<td>Ishii Hyoki</td>
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<tr>
<td>Mar 09</td>
<td>Futamata Furyoku Operates wind-power generators</td>
<td>EOS Engineer</td>
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Government support

Solar Feed-in-Tariff
- In 2010 Tokyo Electric Power Company was mandated to purchase electricity generated by household solar power systems.
- The 2011 rate is JPY 42 kWh (US$0.51 kWh) down from JPY 48 kWh (US$0.58 kWh) in 2010. Decreasing costs of solar panels was the underlying reason behind the tariff price drop.

Home Solar Energy Systems
- Japanese policy makers are encouraging the public to use solar energy and have offered subsidies for households and businesses that purchase solar electric power systems.
- The prime minister recently said he would like to see 10 million Japanese households have solar power systems installed in their homes over the coming years.
- The subsidy will be up to JPY 480,000 (US$5,800) for the purchase of solar power systems.
In January 2010 Renewable Energy Systems (RES) made its first investment into the South African renewable market. The UK based energy project developer acquired a portfolio of wind power projects with an estimated installed capacity totalling 300 MW. RES has identified South Africa as a high growth renewable market and an area where solar and wind resources are abundant. According to industry sources RES is likely to step up its presence in South Africa in the coming years.

Ireland based Mainstream Renewable Power (MRP) entered into a joint venture agreement with Genesis Eco-Energy, a South African wind project operator, to develop an initial 500 MW of wind energy by 2014. It is projected that the capital expenditure will total US$1.2bn over five years. From MRP’s perspective the significant investment was made on the back of the untapped upside potential in wind in the region and the expectation of a coherent and persistent government support programme.

Large international presence in renewables

Virtually every major international renewable energy systems vendor and project developer has a presence of some form in South Africa with some small manufacturing capacity established, particularly in solar water heating, heat pumps and similar sectors. The industry is very fragmented with over 1,000 companies providing a variety of clean energy related services to a population of 55 million. Around 70 technology vending companies are vying for inclusion in the IPPPP programme, each hoping to supply three to ten projects. Over 270 project developers have registered for the IPPPP.

Government to support job growth and alleviate power requirements

There are certainly reasons to be optimistic about the general state of the South African economy after it experienced a positive response to the global economic crisis and has seen inflation decline to a much more palatable level. It does however need to stimulate the creation of five million jobs as high unemployment remains a problem. It is hoped that the renewable energy sectors will go someway in supplying some of these jobs.

Furthermore, 20 GW of renewable power capacity needs to be built if South Africa is to meet its power requirements and its global renewable commitments. Manufacturing competitiveness alone is unlikely to create significant incentives for large international investment in the renewable component manufacturing space. It will be the government incentives and local content programmes that will encourage investment and open up opportunities in manufacturing.

The massive power capacity building programme will require huge foreign investment, and much of this may come in the form of the acquisitions of local generating assets or developers with sector specific knowledge as well as political sway.

Big players entering the market

There have been relatively few M&A transactions in South African cleantech to date. This will change with the launch in August 2011 of the Independent Power Producer Procurement Program (IPPPP) which seeks to procure 3,875 MW of power from predominantly solar and wind.

“With a superb solar resource and a vibrant and innovative industrial sector, M&A opportunities in South African cleantech will be through the merging of independent power producers in the renewable energy sector.”

Dudley Baylis, Bridge Capital Advisors
Photovoltaic vs concentrated solar power

South Africa has among the best solar resource in the world and is in the process of trying to establish a very large solar park with the support of the Clinton Climate Initiative. PV -ground and roof mounted- offers, in our view, the largest sector opportunity in the medium to long term, with wind filling the gap in the interim. It is likely that the utility scale PV generation sector will come to be dominated by five to six players, with projects being clustered into eight to ten large-scale independent power producers each with between 2-5 GW of power capacity.

With the forecast rate of increase in local energy prices and declines in the cost of PV installations, it is likely that PV will dominate the solar sector. Although concentrated solar power (CSP) has promise because of its ability to store energy through high temperature storage, we believe that energy storage systems appropriate for PV will become ubiquitous in the next decade rapidly eroding this advantage. We do not foresee CSP achieving the cost reduction rates experienced in PV, and combined with the ease of installation of PV, we think that this will give PV an extended competitive advantage over CSP. There will be opportunities for CSP, however we think this is likely to be limited to a maximum of 1-2 GW.

Factors to shape the industry

The energy generation sector, currently monopolised by state utility giant Eskom, is in the process of being deregulated. Eskom will most likely fill the role of owner and manager of the national grid - which requires national competence in order to accommodate the large-scale adoption of solar energy, particularly if it is widely distributed.

Looking ahead the keys factors driving the development of the cleantech sector will be the added forms of energy generation needed to accommodate South Africa's power requirements, jobs creation and the provision of modern affordable energy to the 15 million people who are without it. These factors along South Africa's almost unlimited solar resource will shape the industry for the foreseeable future.

Government support

IPPP

- The feed-in-tariff programme promulgated in March 2009 has been replaced by the IPPPP program with a rush of offshore project developers hoping to participate in the 3,875 MW of guaranteed tariff projects.

- A significant component of the IPPPP is the requirement of local development and participation which is anticipated to aid the development of over 18 GW of mostly wind and solar power in the next 20 years. This is expected to showcase South Africa as a leader in the United Nations Framework Convention on Climate Change negotiations which will take place in South Africa in December 2011.

IRP2010

- IRP2010 indicates the most significant shift in energy policy thinking. Renewable energy (excluding nuclear) is now projected to make up 37% of new generation capacity by 2030, approximately 8 GW in each of wind and solar.

- M&A opportunities will likely be enhanced as there will be a significant amount of offshore capital requirements.

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<td>Lyanda Power Technologies</td>
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<td>Wind power</td>
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<td>Apr 09</td>
<td>Genesis Eco-Energy</td>
<td>Wind power</td>
<td>Mainstream Renewable Power (Ire)</td>
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<td>Nov 08</td>
<td>Bio Therm Energy</td>
<td>Renewable energy developer</td>
<td>Denham Capital Management (USA)</td>
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<td>Aug 08</td>
<td>Enviroserv Waste Management</td>
<td>Waste treatment and recycling</td>
<td>Black Economic Empowerment</td>
<td>238</td>
</tr>
</tbody>
</table>

Recent transactions
“The Turkish cleantech sector, supported by strong fundamentals, government support and a resilient banking industry, continues to build on its momentum. Strategic investors are targeting Turkey to capitalise on the market dynamics and to establish long term partnerships with domestic strongholds.”

Can Atacik, Daruma Corporate Finance

Healthy economy despite high inflation

Although inflation has surged in recent times Turkey has realised solid and steady growth over the past eight years thanks to the strong macroeconomic policies that were put in place following Turkey’s own financial crisis in 2001. This has been complemented by a single party government that has actively tried to promote private sector growth. A relative decline in investment opportunities and macroeconomic fundamentals in other emerging markets has further accelerated equity and debt flow into Turkey energising the M&A market. It is expected that these main drivers will continue to fuel Turkish cleantech M&A.

Active hydro market

Turkish M&A volume in cleantech has been relatively low in recent years. Baring a few large deals, average deal value has hovered around the mid-market range. The majority of transactions have been cross-border with some of the most noteworthy transactions being in hydropower.

Deals included the US$380m acquisition of Turkon-MNG, a Turkey based electricity generation company firm with operations in the construction and maintenance of hydropower plants, by Energo PRO of the Czech Republic. Turkon-MNG was previously owned by holding firm Turkon Holding AS and conglomerate MNG Holding AS. The Turkish hydro market also saw Norwegian renewable energy giants Statkraft AS acquire a 95% stake in Yesil Enrji, a Turkish hydropower operator, for US$126m. These deals highlight the attractiveness of participating in an established yet growing Turkish hydro industry.

A notable deal outside of the hydro space was the purchase of a large portfolio of Turkish wind power projects for US$1.1bn by Renewable Energy Systems (RES), a subsidiary of UK based construction firm Sir Robert McAlpine. The wind power projects will amount to 500 MW and will expand RES’ exposure to emerging, fast growing renewable markets.

Rapid growth in wind

According to a study by the European Commission, Turkey has the second highest potential for wind energy generation in Europe after the UK. The state owned national grid company TEIAS has already begun upgrading its distribution infrastructure in an effort to connect 15 GW of wind farms. Indeed, analysis suggests that Turkey’s wind power capacity looks set to grow at around 30% annually until 2014, easily outpacing overall renewable energy capacity growth.

M&A activity

Source: Mergermarket, Corpfin
Geothermal sectors emergence

Starting from a low position, the geothermal sector is starting to live up to its potential. Several domestic strategic investors, such as BM Muhendislik, have begun locating suitable well locations and some have already completed their drilling activities. The state mining authority (MTA) owns a number of fields that have been confirmed as suitable for the construction of power plants.

Transfer of Operating Rights (TORs) are underway for these plants with construction and energy firm Celikler Holding being one of the biggest acquirer’s of TORs, buying enough for a potential 45 MW field. Only a small portion of these have been offered to the market thus far, however, it is expected that a new round of privatisations will take place in the near future.

Consolidation and IPOs to drive M&A market

The consolidation trend in the renewable energy sector, particularly in hydro and wind, will continue over the near term. A number of funds, actively involved in cleantech, are accumulating assets or helping strategic investors accumulate assets with the intention of an exit in the next few years, most likely to either larger strategic investors or through IPOs. With the introduction of the new solar feed-in-tariffs and a lack of affordable technology from Europe and the US, we believe there will be an increase in inbound interest in local technology companies and domestic production facilities by Western firms.

Recent transactions

<table>
<thead>
<tr>
<th>Date</th>
<th>Target</th>
<th>Description</th>
<th>Acquirer</th>
<th>Deal Value (US$m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 11</td>
<td>Anel Energy</td>
<td>Hydroelectric power</td>
<td>Kioto Photovoltaics (Austria)</td>
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<td>Oct 10</td>
<td>Cooper Island</td>
<td>Steel dust recycling</td>
<td>Befesa Medio Ambiente, SA (Spain)</td>
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<td>Sep 10</td>
<td>Dogal Elektrik Uretim A.S.</td>
<td>Hydroelectric power</td>
<td>Hamza Dogan</td>
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<tr>
<td>Apr 10</td>
<td>Turkon-MNG</td>
<td>Hydropower plants</td>
<td>Energo PRO A.S. (Czech Republic)</td>
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<tr>
<td>Apr 10</td>
<td>ABK Elektrik Uretim</td>
<td>Wind farm management</td>
<td>Undisclosed bidder</td>
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<td>Oct 09</td>
<td>Turkish Wind Power Projects</td>
<td>Wind farms</td>
<td>Renewable Energy Systems (UK)</td>
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<td>Jun 09</td>
<td>Yesil Enerji AS</td>
<td>Hydropower</td>
<td>Statkraft AS (Norway)</td>
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</tr>
<tr>
<td>Dec 08</td>
<td>Polat Energy Industry &amp; Trade Inc</td>
<td>Developer of wind energy</td>
<td>EDF Energies Nouvelles SA (France)</td>
<td>n/d</td>
</tr>
<tr>
<td>Jul 08</td>
<td>Bares Elektrik Uretim AS</td>
<td>Wind energy company</td>
<td>Italien SpA (Italy)</td>
<td>51</td>
</tr>
<tr>
<td>Mar 08</td>
<td>Demrad Dokum</td>
<td>Photovoltaic installation</td>
<td>EDF Energies Nouvelles (France)</td>
<td>n/d</td>
</tr>
</tbody>
</table>

Government support

Amendment to Law on Renewable Resource Utilization

The amendment to the 2008 law changed the ten year guaranteed feed-in-tariff price of US$0.07-0.08 for energy supplied from renewable sources to provide differing rates for different sources. The new rates are US$0.133 kWh for solar, plant-burning biomass and gas produced by organic waste, US$0.105 kWh for geothermal and US$0.073 kWh for hydro and wind.

The amendment also added incentives for plants sourcing equipment or components from domestic suppliers. The dynamic pricing system should help maintain steady investment flows into the Turkish cleantech industry.

Changes in the energy market operational structure

Based on the government’s recent strategy paper, policy makers have made changes to the renewable market operating system.

The most significant changes are the creation of an energy spot market and a more transparent pricing structure in the energy trading market.
New business models to drive growth

2010 deal volume was up from the year before and this auspicious trend looks set to continue as deal volume for H1 2011 has already almost equalled the 2010 figure. The French M&A market is strongly fuelled by blue chip companies acquiring technologies to transform their business models and generate additional growth. This was illustrated by General Electric’s acquisition of Converteam, a multi-faceted electrical engineering cleantech firm, for US$3.2bn.

This common theme was also evident in EDF’s acquisition of the remaining 50% shares of its renewable energy subsidiary EDF Energies Nouvelles. Alongside nuclear production (EDF is the world’s leading producer of nuclear energy) renewable energy enables the group to further diversify its forms of decarbonised energy production, which currently accounts for 74% of its installed capacity. By launching an offering for its renewable energy arm a few weeks after the Fukushima disaster EDF sent a strong signal of intent that it is serious about seeking a greener portfolio.

EU and domestic directives driving the sector

Although there is a strong disposition towards cleantech solutions by both the public and domestic policy makers, the French cleantech market is primarily driven by the EU’s ambitious 20-20-20 target, the objective of having 20% of total energy consumption to be generated through renewable means by 2020.

Through sustainable actions and commitments, many of the EU directives are laid out in France’s “Grenelle de l’Environnement” laws of 2007 and 2010:

I. New standards and rules are defined for building and housing energy
II. New tax system favouring green automotives and waste-to-product & waste-to-energy solutions

This framework, combined with favourable feed-in-tariffs and easier permitting procedures, will provide a boost to offshore wind, biogas and biomass, hydrogen-related solutions, sustainable waste management (waste to energy and waste to products), smart grid and the energy storage sectors. After some initial problems that came about due to reduced feed-in-tariffs and a distinct lack of visibility, the geothermal market is now recovering thanks to new building energy standards, and the solar market should begin recovering over the next 18 to 24 months. Expect these sectors to become more stable and less speculative.

“Market leaders are looking to capture the growth of sustainable technologies and infrastructure, which should lead to a boost in M&A activity and increase strategic premiums.”

Michel Degryck, Capital Partner

M&A activity
New feed-in-tariffs for biomass and biogas

In February 2011 French policy makers introduced new generous feed-in-tariff rates to support the sustainable development of its biomass and biogas sectors. The rates were raised by approximately 50% in an effort to make biomass/biogas energy generation more cost-effective and competitive compared to fossil fuels. The lucrative tariff increases will entice long-term investors and should stimulate M&A in the sector as firms vie for market share in what will be an increasingly profitable segment of renewables.

Energy conglomerates increasingly drawn to emerging countries

French energy conglomerates (e.g. EDF, Areva, Total, Suez), environment service providers (e.g. Suez Environnement, Veolia) and traditional industrials (e.g. Schneider Electric, Alstom, Saint-Gobain) are actively seeking entry into emerging markets as they look to capture their strong GDP growth, their ever expanding energy needs and their low cost resources. They are also looking to acquire energy efficiency technologies (mostly in Europe and the US) to broaden their services and products portfolio of value-added solutions. This strong market movement is being followed by mid-sized companies, generating an increase in domestic and cross-border M&A.

Sector forecast

After two years of a buoyant fund raising market (more than 120 cleantech fund raisings in France), successful emerging cleantech firms will start becoming targets to strategic buyers offering multiples exceeding 10x EBITDA, providing high returns to their financial investors.

In the short to medium term the French cleantech sector will likely experience piecemeal movements rather than wholesale changes. Nevertheless, the sector should enjoy double digit growth in the coming years, supported by the Grenelle objectives and tax on polluting initiatives.

Recent transactions

<table>
<thead>
<tr>
<th>Date</th>
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<th>Description</th>
<th>Acquirer</th>
<th>Deal Value (US$m)</th>
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<tbody>
<tr>
<td>Jul 11</td>
<td>Power ENR</td>
<td>Wind and solar farms</td>
<td>Axa PE and Neoen</td>
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<tr>
<td>Jun 11</td>
<td>Telvent</td>
<td>IT for sustainable activity</td>
<td>Schneider Electric</td>
<td>1,400</td>
</tr>
<tr>
<td>Jun 11</td>
<td>Leader Harvest Power</td>
<td>Medium voltage drives</td>
<td>Schneider Electric</td>
<td>450</td>
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<td>Apr 11</td>
<td>EDF Energies Nouvelles</td>
<td>Renewable energy</td>
<td>EDF</td>
<td>6,650</td>
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<td>Apr 11</td>
<td>SunPower</td>
<td>Photovoltaic panels</td>
<td>Total</td>
<td>1,050</td>
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<tr>
<td>Mar 11</td>
<td>Converteam</td>
<td>Power conversion</td>
<td>General Electric</td>
<td>3,200</td>
</tr>
<tr>
<td>Mar 11</td>
<td>Ecoslops</td>
<td>Residues recycling</td>
<td>BNP Paribas n/d</td>
<td></td>
</tr>
<tr>
<td>Mar 11</td>
<td>Biogazyl</td>
<td>Biomass</td>
<td>Saria</td>
<td>12</td>
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<tr>
<td>Feb 11</td>
<td>ASCAL</td>
<td>Testing</td>
<td>Eurofins</td>
<td>n/d</td>
</tr>
<tr>
<td>Dec '10</td>
<td>Carso</td>
<td>Testing</td>
<td>FSI (French state funds)</td>
<td>n/d</td>
</tr>
</tbody>
</table>

Government support

Amendment to the state photovoltaic policy

- As 2020 objectives are set to be achieved by 2013-14, the French government placed a three month moratorium on PV projects to determine the future of the sub-sector. In March 2011 policy makers agreed to reduce PV subsidies by up to 40% in an attempt to prevent market speculation and to reduce costs.

- This new policy has strongly reduced PV activity in France, causing financial difficulties for market players. This new initiative will also likely have a very negative impact on PV M&A in France.

New TGAP rates

- In December 2010 France introduced new TGAP rates (tax on polluting activities and waste). The tax applies to every producer of waste and polluter of emissions.

- The TGAP provisions are to increase progressively over the coming years but are subject to strong and increasing deductions if pollution is tackled through appropriate green means such as through waste to energy, biogas and recycling. TGAP should be a clear booster to waste to product and waste to energy solutions.
Inc. With a purchase price of US$340m this was one of the bigger renewable German targeted energy transactions of 2010. The acquisition is a significant step in Solutia’s plans to strategically grow its specialty chemicals and performance materials portfolio by enhancing its current businesses.

Primary influencing factors

The industry is driven by three major factors: The EEG legislation with feed-in-tariffs. The 20-20-20 target by the EU 27 (20% of final energy consumption must be generated by renewable energy in 2020, in 2010 the figure stood at 11% in Germany). The shut down of seven to eight nuclear plants in 2011 in Germany after the Fukushima disaster and the total exit of nuclear energy around 2022.

Stumbling blocks to wind energy expansion

Although new installed capacity was down in 2010 compared to the year before there is no doubt that wind energy will play a considerable role in helping Germany achieve its EU 27 targets; wind is expected to provide 25% of electricity generation by 2020.

Numerous wind parks have already been planned for construction in the North Sea. The current problem facing Germany’s energy infrastructure is that most of the electricity is needed in the southern states of Germany.

Felix Hoch, CH Reynolds Corporate Finance

Notable deals in solar

In February 2011 Germany’s Calyxo, Europe’s second largest producer of solar modules, was acquired by US based Solar Fields for an undisclosed sum. The purchase will allow Calyxo to develop its business model in non-European markets such as Asia and the US.

In June 2010 the German based supplier of EVA films for the encapsulation of solar cells in PV solar modules Etimex Solar GmbH was acquired by US based Solutia
The existing grid is unable to provide sufficient capacity to transport the electricity from the north to the south. Experts have estimated a need for approximately 3,600 km of further high voltage long distance grid.

Such an endeavour will not be straightforward to implement due to local opposition. Equally, any onshore wind projects targeted at the densely populated southern regions will also likely be opposed. Nonetheless, with the intended exit from nuclear power, policy makers will look to wind power to bridge the energy gap. We expect the larger energy players to become increasingly active in targeting both wind turbine manufacturers and wind farm projects.

Germany seeks to retain automotive excellence

The automotive industry, one of the most important German industry sectors, is now strongly pushing the development of electric vehicles with the target of having one million electric vehicles on German roads by 2020. This major thrust, facilitated by government initiatives, will have a profound effect on the general shape of the industry as the key success factors associated with electric cars such as batteries, electric motors and light-weight chassis differ significantly to the automotive norm.

The precarious state of the German photovoltaic sector

There has been substantial investment in the German PV sector, more than all the other renewable sectors combined: US$19.5bn compared to US$2.5bn in wind and US$1.55bn in biomass. This is despite the fact that significantly more energy was produced by wind and biomass compared to PV.

The German PV sector is currently at a cross roads; although it receives the highest subsidies it is not producing sufficient amounts of energy. International competition has increased dramatically, especially from Asian companies where not only are prices more competitive but the quality of their products is on course to meet near parity over the next decade. What is more, reductions in subsidies will reduce the attractiveness of PV electricity, at least in the short run. German firms participating in the sector may therefore look for opportunities abroad.

Recent transactions

<table>
<thead>
<tr>
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<th>Acquirer</th>
<th>Deal Value (US$m)</th>
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<tbody>
<tr>
<td>Jun 11</td>
<td>Projet Green</td>
<td>Wind farms</td>
<td>EOS Holding SA (Switzerland)</td>
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<tr>
<td>Apr 11</td>
<td>Solarkraftwerk Ahorn</td>
<td>Operates a solar park</td>
<td>Investor Group</td>
<td>n/d</td>
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<tr>
<td>Feb 11</td>
<td>Solarparc AG</td>
<td>Alternative energy services</td>
<td>SolarWorld AG</td>
<td>73</td>
</tr>
<tr>
<td>Feb 11</td>
<td>Calyxo GmbH</td>
<td>Solar power cells</td>
<td>Solar Fields (USA)</td>
<td>n/d</td>
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<tr>
<td>Feb 11</td>
<td>REETEC Regenerative</td>
<td>Machinery to the wind industry</td>
<td>EDF Nouvelles (France)</td>
<td>n/d</td>
</tr>
<tr>
<td>Feb 11</td>
<td>HKV GmbH</td>
<td>Biomass, photovoltaic</td>
<td>Kosinus Holding BV (Netherlands)</td>
<td>n/d</td>
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<td>Jan 11</td>
<td>SOLAR23 GmbH</td>
<td>PV-grid</td>
<td>Ubbink BV (Netherlands)</td>
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<tr>
<td>Dec 10</td>
<td>Epuron GmbH- Wind Assets</td>
<td>Wind development</td>
<td>Impax New Energy Investors II (UK)</td>
<td>n/d</td>
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<tr>
<td>Nov 10</td>
<td>SUNSELEX GMBH</td>
<td>Solar panels</td>
<td>JPK Beteiligungs GmbH</td>
<td>19</td>
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<tr>
<td>Nov 10</td>
<td>SLS Solar Line</td>
<td>Solar cell production</td>
<td>Roth &amp; Rau AG</td>
<td>49</td>
</tr>
</tbody>
</table>

Government support

Renewable Energy Sources Act (EEG)
- The EEG provides subsidies for energy produced from renewable sources. The act’s most significant fiscal incentive has been the feed-in-tariffs (FITs) initiative.
- The FITs would normally remain unchanged throughout the 20 year period after connection to the grid. There is now however potential for year on year reductions to the FITs for new projects which has resulted in uncertainty in the market and a rush to get renewable projects completed before the end of this year. This has been especially apparent in solar.

Environment and Energy Efficiency Programme
- Under this loan subsidy initiative, state owned banks provide artificially low interest loans to small-medium sized enterprises operating in cleantech.
- The loans are available to both domestic and foreign companies operating in the German “green” industries.
Cleantech flourishing despite macro concerns

Contagion from Greece and Portugal along with dangerously high levels of government debt (120% of GDP) has been a cause for alarm for investors throughout 2011.

Despite Italy’s economic concerns, the cleantech industry has not suffered as a result. It experienced an 8.6% year on year increase in 2010. Wind production was up 29.1% whilst PV production exploded, rising 136.5%.

Italian energy giant ENEL currently leads the pack in both hydroelectric and geothermal production by market share (56% and 100% respectively) whilst multinational British based electricity operator International Power has positioned itself at the forefront of wind power in Italy (17%). Meanwhile, Italian utility company A2A dominates the biogas, biomass solid waste energy production segments. In terms of installed capacity the PV segment is still negligible compared to overall energy generation. PV players tend to be smaller and more dispersed and are, for the most part, newcomers to the energy market.

Recovery in cleantech M&A

Italian cleantech M&A is currently experiencing one its most buoyant periods. Deal volume over the past 18 months has been high whilst average deal value rose steeply from years previously. Bucking the overall global trend, cross-border activity also experienced an increase in activity.

Of these cross-border deals one of the largest was the sale of Rete Rinnovabile, a PV company with a production capacity equating to approximately 10% of Italy’s total solar capacity, to UK based private equity firm Terra Firma. The deal value amounted to US$899m (US$6.2m per MW). All of Rete Rinnovabile’s 145 MW power generation will benefit from the Conto Energia feed-in-tarrifs – See inset.

Deals in the solar segment continue to dominate the cleantech market, however, there has been a marked increase in the number of deals in the other renewable sub-sectors. These market trends can be partly attributed to the kneejerk reductions in PV subsidies which resulted in supply suddenly exceeding demand. Deals outside the solar space included the sale of turbine manufacturers Hydro Co-Ver to Italian private equity firm Finanziaria and ERG Renew’s acquisition of wind farm operator IVPC Power 5.

Energy services dominated by French players

The Italian energy efficiency and services sectors are dominated by a crop of large French firms; Dalkia, GDF Suez, Veolia and Cofatech. The current support scheme for the energy efficiency sector - the so called White Certificates - has proven to be wildly convoluted and ineffective. A new incentive system is expected to be passed coupled with a more pronounced power purchase agreements arrangement. This should support domestic firms allowing them to grow and develop to a point where they can successfully compete with their French
counterparts. In the meantime, we expect to see more foreign firms entering the market to capitalise on the poor energy efficiency of Italy’s private and public sector buildings.

**Solar M&A opportunities in the wake of reduced support mechanisms**

Previously, the state had maintained high solar feed-in-tariffs despite declining technology prices. As a consequence, cumulative installed capacity more than doubled every year and now stands at 2.9 GW. The revision of the state support scheme has left the Italian PV sector in a precarious state. Despite this uncertainty, we expect the recent slowdown in solar M&A activity to reverse:

- The most recent feed-in-tariff scheme (the 4th Conto Energia) will limit the construction of large-scale PV plants, therefore investors that entered the industry to diversify their investments over the past two or three years will start seeking opportunities to divest and take advantage of the increasing prices of already built PV plants.

- We are already seeing acquisitions of these assets gain momentum and are starting to see some upward pressure on their valuations.

**Futures buyers of foreign cleantech**

Outbound investment from local acquirer’s has historically come from large independent power producers or utility firms. Enel Green Power, the listed green energy company of Enel, is active in acquiring global cleantech assets particularly in North and South America. Other active cross-border buyers include Ambiента SGR, Solar Ventures, Atmos Group, ERG Renew and TermeEnergia.

Despite turbulent economic conditions, Italy remains a strong cleantech market. We do however expect investors, both domestic and foreign, to be a lot more mindful about the fundamental business viability of potential targets due to the overhaul in state subsidies.

### Recent transactions

<table>
<thead>
<tr>
<th>Date</th>
<th>Target Description</th>
<th>Acquirer</th>
<th>Deal Value (US$m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 11</td>
<td>Sorgenia Solar S.r.l.</td>
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<tr>
<td>Apr 11</td>
<td>Hydro Co-Ver S.r.l.</td>
<td>Palladio Finanziaria</td>
<td>n/d</td>
</tr>
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<td>Mar 11</td>
<td>Ansaldow Trasmissione</td>
<td>Toshiba Corporation</td>
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<td>Dec 10</td>
<td>Fortore Energia</td>
<td>BOW FMB Energie AG (Switzerland)</td>
<td>n/d</td>
</tr>
<tr>
<td>Dec 10</td>
<td>Italgest Photovoltaic</td>
<td>GSF Capital (Luxembourg)</td>
<td>n/d</td>
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<td>Nov 10</td>
<td>Energia Tre</td>
<td>Mistral International (Luxembourg)</td>
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<tr>
<td>Oct 10</td>
<td>Rete Rinnovabile</td>
<td>Terra Firma Capital (UK)</td>
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<td>Jun 10</td>
<td>IVPC Power 5 S.r.l.</td>
<td>ERG Renew S.p.A</td>
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<tr>
<td>Feb 10</td>
<td>Italgest Wind S.r.l.</td>
<td>Enel Green Power</td>
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<tr>
<td>Jan 10</td>
<td>Italian Wind Energy</td>
<td>EDP Renoveveis (Spain)</td>
<td>17</td>
</tr>
</tbody>
</table>

### Government support

**Renewables Framework Bill**

- The Legislative Decree No. 387 of 2003 enacting the European directive 2001/77/EC effectively marked the beginning of the renewable energy market in Italy.

- The decree lays out various policy initiatives such as simplifying the approval process for renewable energy plant construction, fixed incentive tariffs, grid improvements and fines.

**The Fourth Conto Energia**

- An offshoot of Decree 387, the Conto Energia feed-in-tariffs have made Italy the world’s most profitable PV market. The most recent feed-in-tariff framework however establishes a sharp reduction in incentives and subsidies and sets limits to the number of large-scale PV projects built.

- The overall effect on M&A could turn out to be net neutral as regulatory uncertainty and reduced tariff guarantees will put off certain sector players while existing PV plants, newly available on the secondary market, should prove attractive to investors.
AG become a major turnkey player in solar technology. The acquired technology will also enable the company to expand its crystalline silicon solar cell offerings.

There have been some notable cross-border movements including South Korea based firm STX Heavy Industries’ acquisition of Harakosan Europe BV, a Dutch producer of multi megawatt gearless wind turbines. Through this acquisition, STX has secured key technologies for the installation and maintenance of wind power plants. Elsewhere, MCP Group SA, a Belgium based firm with substantial operations in scrap recycling, was acquired by Canadian metal and chemicals firm 5N Plus for US$301m.

**Macro indicators remain strong**

The Dutch economy remains one of the most robust in the EU. Its strong trade links with Germany, which itself is experiencing its own sturdy, albeit moderating, recovery, has facilitated the Netherlands steady growth rates. Dutch companies have traditionally been highly active in global M&A relative to its GDP; the Netherlands being the third largest investor in the US being a good case in point.

A good deal of cleantech activity over the past few years involved the consolidation of the waste management sector, although transactions in wind energy (equipment and generation) and solar cells were also evident.

**Lively M&A market**

In recent years there has been substantial M&A activity in cleantech in the Netherlands. Transaction volumes peaked in 2009, while transaction values were also high during that year with the total deal value exceeding US$1bn.

There have been no big ticket deals over the past 18 months, however, there were some notable mid-market transactions including the acquisition of Dutch solar cell producer OTB Solar by German solar energy firm Roth & Rau AG for US$51m. The acquisition will help Roth & Rau

“For decades the Netherlands has been at the forefront of the global water technology and water management industries. The government’s recent decision to offer additional support to these sub-sectors in their ‘Top Technology Sectors’ should help entice investors looking to invest in firms with a clear competitive advantage.”

Ronald Bobbe, Bluemind Corporate Finance

**Growing interest from private equity**

Private equity’s intent on the Benelux cleantech market has become increasingly pronounced. French private equity firm Crédit Agricole PE acquired a stake in Ikaros Solar, one of Belgium’s more prominent PV solar energy plant manufacturers. Crédit Agricole has already made 18 investments in the wind, solar, hydroelectric and biomass segments.

There has been a growing tendency by private equity firms to set up funds which focus exclusively on cleantech. Waterland Private Equity, Capricorn Venture Partners and NIBC, are expected to become major cleantech investors over the coming years.
Key sub-sectors

The most important sub-sectors in the Netherlands are wind, water and waste management.

Wind in particular remains an interesting proposition for investors. Although capacity is already high (it has the largest offshore wind capacity next to the UK and Denmark) there is still plenty of room for expansion in the technology enhancement and efficiency side of this sub-sector.

The Netherlands has a highly developed water management industry and current government policy to make it one of the key technology sectors is expected to boost activity and investments even further.

The Netherlands is also one of Europe’s leaders in waste management and recycling. Large players include Van Gansewinkel Group and Shanks, both of which have made several recent key acquisitions.

Expansive growth predicted

The Dutch cleantech market has the potential to grow from US$2.6bn today to US$12.3bn in 2015 partly fuelled by EU regulations and its energy targets for 2020 and partly fuelled by the Netherlands technical ingenuity and competitive advantage across certain sub-sectors.

We expect M&A growth to be greatest in wind where there have been several noteworthy acquisitions in both technology and wind park operators in recent years. We also expect further consolidation in waste management in the coming years, mainly due to the capital intensity of the sector and a need for up-scaling.

Recent transactions

<table>
<thead>
<tr>
<th>Date</th>
<th>Target</th>
<th>Description</th>
<th>Acquirer</th>
<th>Deal Value (US$m)</th>
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<tr>
<td>Jul 11</td>
<td>Enfinity</td>
<td>Green electricity distributor</td>
<td>Waterland PE (UK)</td>
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<td>Jun 11</td>
<td>Van Gansewinkel Groep</td>
<td>Solid waste management</td>
<td>Veolia Environmental Services (France)</td>
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<td>May 11</td>
<td>Norther NV</td>
<td>Solar products</td>
<td>Electrawinds NV</td>
<td>n/d</td>
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<td>Apr 11</td>
<td>Horizon Energy BV</td>
<td>Solar energy developer</td>
<td>HVC NV</td>
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<tr>
<td>Apr 11</td>
<td>Verhuur EN Energie</td>
<td>Energy efficiency</td>
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<td>Apr 11</td>
<td>Ducati NV</td>
<td>Solar energy developer</td>
<td>Capricorn Venture</td>
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<td>Apr 11</td>
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<td>Mar 11</td>
<td>Ikaros Solar NV</td>
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<td>Feb 11</td>
<td>Novopolymers NV</td>
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<td>Capricorn Venture</td>
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<tr>
<td>Dec 10</td>
<td>Mastervolt International</td>
<td>Solar products</td>
<td>Actuant Corporation (USA)</td>
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</table>

Government support

The Environmental Act 2011

The Environmental Act 2011 draws from the EU Directive of 2008/9 which requires that EU members revise their environmental legislation before 2013. The EU Directive introduces new regulations and sets new waste management and recycling targets.

Since the Netherlands is already close to meeting its recycling targets the new law will help Dutch companies gain more momentum. M&A activity may increase as firms look to capitalise on this clear competitive advantage.

Top Technology Sectors

Policy makers have pinpointed nine economic sectors to which they will offer financial and regulatory support. One of those sectors is water management/conservation.

Because of the high-cost, low yielding nature of the water management/conservation industry, we expect foreign firms, through M&A, to penetrate the Dutch market to take advantage of these support schemes.
“The Polish cleantech sector is set to grow exponentially from a nominal base. While production and generation will increasingly be the purview of the market giants, there will be a range of opportunities for those servicing and adding value to this emerging industry.”

Michael Harvey, IPOPEMA Securities

Several factors to spur on cleantech growth

Poland has performed well over the crisis, being the only EU country not to move into recession, and growth forecasts for the coming years remain healthy at 4.2% and 3.9% for 2011 and 2012 respectively. Ageing power stations, limited installation of new generating capacity along with the strong economic growth of the past decade is putting huge pressure on capacity in the medium term. This combined with Poland’s commitment to produce 15% of its energy from renewable sources by 2015 means that focus will continue to be on new and alternative forms of energy and other green initiatives.

A developing industry

Overall volumes in cleantech M&A have been relatively low compared to Poland’s more westerly neighbours and reflects the relatively underdeveloped nature of its cleantech industry. Focus to date has been on the large power production and distribution companies buying out project stage or just completed wind generation projects from smaller entrepreneurial businesses.

Acquirers of wind power projects have fallen into three broad categories: Multinational power groups with expertise in renewables like Iberdrola and Acciona, who are keen to stake a claim in what is an adolescent, yet highly promising and large-scale market. German based power generators (like RWE) expanding across the border

(Poland’s North-West coastal area is adjacent to some of Germany’s largest wind farms in Mecklenburg and Brandenburg) and local Polish power generators, looking to acquire production capacity to make up for their limited investment to date.

Several of the larger wind farm sales have been carried out by Warsaw Stock Exchange listed energy generation firm Polish Energy Partners SA, which sold a series of wind farms to RWE and Electrabel. They also sold 43 MW Pagowo and 30 MW Wartkowo projects to GDF Suez (for around US$21m), broadening its relationship with the French power company which also includes joint involvement in biomass power development.

World’s largest biomass plant

In the biomass space, Canadian based Carbon Friendly Solutions acquired a 51% stake in biomass pellet producer Carbiopeel in May 2011. The latter is to produce 20,000 tonnes of pellets in 2011, rising to 80,000 tonnes in 2016. The pellets will be feed stock for the world’s largest biomass plant; the 190 MW unit currently under construction at the Polaniec power plant owned by French energy giant GDF Suez. It is expected to consume around 1 mn tonnes of biomass annually. The deal highlights the interest foreign buyers have in locking in long-term relationships in early stage markets with global leaders.
Promise in wind, biomass and biogas

While Poland’s theoretical wind capacity is similar to Germany’s, its current installed wind power capacity is less than 3% of that of its neighbour. Key constraints include bureaucratic hurdles in licensing and network connections and structural problems with the grid network, which is poorly developed in the areas with the highest wind potential. However, thanks to a recent streamlining of legislation and mounting pressure on power generators and distributors, installed wind capacity is expected to grow exponentially from 1.58 GW (with just over fifty largely small-scale wind farms) in 2010, to just under three times that level (5.19 GW) by 2015.

Poland’s large arable farming and forest industries also offer considerable scope for industrial and farm enterprise scale biogas and biomass facilities. These projects are still in their infancy, with only 16 biomass plants with an overall capacity of 254 MW and 136 small-scale biogas plants generating just 79 MW in place to date. Poland’s potential in this area is largely unexploited but these segments are expected to play a significant role in the future.

Looking ahead

There will be an increasing number of transactions as the project approval process initiated by a wide range of smaller companies reach fruition, and are bought out by a widening range of big-league buyers.

The wind power sector will, in its turn, require project development, construction and maintenance services whilst biogas and biomass sectors demand large-scale infrastructure, logistics, financing and long-term cooperation between a disparate group of collaborators to succeed.

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<td>E-Star Alternative (Hungary)</td>
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<td>May 11</td>
<td>Portfolio of Wind Farms, Poland</td>
<td>Wind farms</td>
<td>ELKOP Energy</td>
<td>n/d</td>
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<td>Jan 11</td>
<td>Piecki Wind Farms</td>
<td>16 wind turbines</td>
<td>RWE Innogy GmbH, (Germany)</td>
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<td>Jun 10</td>
<td>Centrafon Wroclaw SA</td>
<td>Metal recycling services</td>
<td>KGHM Ecom SA</td>
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<td>Portfolio of Wind Farms, Poland</td>
<td>Wind farms</td>
<td>AES Wind Generation (USA)</td>
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<td>Iberdrola Renewables</td>
<td>Wind farms</td>
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<td>Jul 09</td>
<td>Gamar SL, Poland</td>
<td>Develops wind farm projects</td>
<td>Renewable Energy Holdings (UK)</td>
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<td>Ecofy Poland Sp Zoo</td>
<td>Energy saving services</td>
<td>Aveco de Bondt (Netherlands)</td>
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<td>May 09</td>
<td>Eco-Wind Construction</td>
<td>Wind plant manufacturer</td>
<td>Trakcja-Titra SA</td>
<td>7</td>
</tr>
</tbody>
</table>

Government support

Certificates of Origin

- The government encourages renewable energy investment through its Certificates of Origin initiative, otherwise known as Green Certificates. The initiative requires electricity distributors to buy renewable energy, and at premium prices. The current renewable quota is 10.4% rising to 11.9% in 2014 and 12.9% in 2017. These rights are negotiable and can be traded on the Polish Power Exchange.

- Renewable investments will likely hasten as power companies strive to comply with the rising quota.

Ministry of Economy energy targets

- Cleantech investment in Poland is being underpinned by EU legislation such as the requirement under EU law that 15% of Poland’s electricity output be produced from renewable means by 2015. Poland’s Ministry of Economy expects 8.9% renewable electricity output by Q4 2011, rising to 13% by 2015 and 19% by 2030.
“For Russia to remain an energy superpower it needs to supplement its wealth of natural resources with investment in advanced technology. Therefore, not only are foreign companies still acquiring Russian resources, there is a new trend of rich Russian companies acquiring foreign technology through M&A and joint ventures.”

David Wolfe, Northstar Corporate Finance

**Russia yet to capitalise on its potential renewable capacity**

With Russia home to a tenth of the world’s oil reserves, a third of the world’s natural gas reserves and a fifth of the world’s coal reserves it should come as no surprise that the country is not at the forefront of the global renewable push. There have been no sweeping state initiatives nor has there been an immediate or practical need to pursue green policies as conventional energy remains (artificially) cheap. There have been some small moves of late by state sponsored and private companies to engage in renewable energy projects with joint ventures (JVs) facilitating proceedings.

Large-scale hydropower is by far and away the most developed renewable source of energy in Russia. Approximately 16% of electricity is produced by hydropower (45 GW capacity). Geothermal is the next biggest source, contributing just 307 MW. Russia also produces 186 bn tonnes of peat, second only to Canada, however only 1.5 mn tonnes per annum is used for fuel production.

**Joint ventures key to Russia’s cleantech push**

In June 2011 French energy conglomerate Alstom entered the Russian renewable market through an agreement with Russia’s hydropower generation giant Rushydro. The agreement between the two stipulates the creation of a hydropower manufacturing facility in the Russian federal state of Bashkortostan. The plant will manufacture equipment across the hydropower production chain as well as auxiliary equipment. This agreement will strengthen Alstom’s growing presence in Russia’s energy market whilst technology spillover should help ensure improvements in the efficiency of Russian hydropower plants.

In 2010 Siemens retained a majority stake in a joint venture with Rushydro and state owned technology body Rostechnologii to develop wind component production facilities. The turbines and components built will serve the Russian market as well as the peripheral markets surrounding Russia. The JV establishes a major renewable player in the region and broadens the capabilities of Russia’s energy production output. In a statement made following the agreement, the CEO of Siemens confirmed the company’s intention to install up to 500 MW annually for the next five years.

**Russian electricity production by source**

Source: eia.gov

- **Nuclear**: 0.5%
- **Hydro**: 16%
- **Other Renewables**: 15.5%
- **Thermal**: 68%
Largest wood pellet plant in the world

Finnish softwood sulfite pulp firm Vyborgskaya Cellulose and Finnish forestry services firm Ekman & Co pooled resources to develop a wood pellet plant in Sovietsky, a region in Russia close to the Finnish border. On its completion in December 2010 the plant became the largest wood pellet plant in the world and twice as large as any other plant currently in existence. Overall production of wood pellets will be in the region of 1 mn tonnes per year. The target market for the pellets will be Scandinavia and parts of central Europe.

Energy powers looking east

Major Russian energy players Rushydro and Inter Rao UES are ostensibly keeping to their geographical and geopolitical comfort zone with regards to their cross-border movements. They are mostly, but not exclusively, targeting companies and assets in the former Soviet bloc or in former Soviet allied countries such as Venezuela and Vietnam.

Examples include Inter RAO UES’ US$104m purchase of Georgian hydroelectric power stations AO Khrami GES-1 and AO Khrami GES-2. The two plants will provide 110 MW combined, which works out to roughly US$1m per MW. Elsewhere, Rushydro acquired a 51% stake in Dakdrinh Hydropower from Vietnamese state energy firm PetroVietnam. Upon completion of the deal, Dakdrinh were in the process of constructing a US$125m-150m 125 MW hydropower plant in Vietnam. Rushydro also acquired 100% of the 560 MW Sevano-Razdan hydropower cascade in Armenia.

Short term goal to be on grid modernisation

Russia’s ageing grid infrastructure is in desperate need of modernisation. It has been estimated that the distribution infrastructure loses up to 12% of energy transmission at a cost of US$10bn annually. Russia is just beginning to invest in smart grid projects which, in the long term, should smooth the deployment of renewable energy technologies.

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<tr>
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<td>Rusnano Solar modules technology</td>
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<td>Rushydro Energy Distribution OAO Hydro</td>
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<td>Jugenergopromtrans Hydroelectric power plants</td>
<td>Alter Energy Group AG (Switzerland)</td>
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<td>Jun 08</td>
<td>OGK-5 JSC Hydro interests</td>
<td>Enel Investment Holding Bv (NL)</td>
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<td></td>
</tr>
</tbody>
</table>

Government support

The Energy Strategy Document

- The document outlines Russia’s energy priorities which includes increasing energy efficiency, reducing pollution’s impact on the environment, promoting sustainable, energy and technological development. It also promotes more openness and competitiveness in the energy market framework.
- In 2009 policy makers set a target of increasing its share of renewable electricity generation to 4.5% from less than 1% today. Direct investments and minimal support structures have been promised to facilitate achieving this target.

The Federal Law FZ 250

- The Federal Law FZ 250 enacted in 2007 focuses on the reorganisation of the equity positions of companies in the Unified Energy System of Russia and of other federally owned joint-stock companies in the Russian electricity industry. The result of which appears to be more competitive and efficient electricity companies that are more prone to invest in the future development of Russian electricity.
- Implicit in this law is a policy for promoting the use of renewable sources for electricity power generation. However, there are no specific incentives such as feed-in-tariffs or subsidies.
A recipe for success

For years the Scandinavian countries have made extensive efforts championing cleantech and have been considerably successful in this field: Denmark is a world forerunner in wind energy technology, Norway is one of the world’s leading innovators of solar technology and home to Europe’s biggest renewable energy operator; Statkraft, whilst Sweden is leading the way in biomass technology.

The most prevalent renewable sources in Scandinavia are hydro, wind, solar and bio-energy. Sweden has the highest share of renewable in the energy mix (excluding large-scale hydro) among the EU27 and is well positioned to meet its EU energy and climate commitments by 2020.

Healthy industry

M&A volume in cleantech was unimpeded by the economic slowdown and even rose at the height of the downturn. The latest notable deals include the purchase of Swedish biorefinery firm Domsio Fariker by the Aditya Birla Group, an Indian conglomerate with a substantial renewable interest, from a consortium of Sweden-based private investors for a consideration of US$340m. Domsio Fabriker’s state-of-the-art biorefinery will give Aditya Birla access to a variety of different renewable sources they currently lack exposure to.

In June 2011 GWM Renewable Energy, the subsidiary of Italian wealth management group GWM, agreed to acquire a 50% stake in Danish wind energy specialists Greentech Energy Systems via a capital increase, on top of the 10% it already holds on a pro-forma basis. The 60% share capital ownership means GWM will have to make a mandatory offer for the remaining shares. The purchase will afford Greentech with the added capital as well as access to a prominent industrial shareholder to help push forward its wind power strategy whilst expanding into other areas of renewable power including solar and biomass.

In one of largest deals in the renewable sector over the past couple of years Norway based Elkem AS, one of the world’s pre-eminent solar grade silicon developers, was acquired by China based chemical firm China Bluestar Group. The landmark deal will give Elkem access to the vast and burgeoning Chinese renewable market.

Offshore wind in Scandinavia

Denmark were pioneers in offshore wind having developed its first offshore wind farm in 1991. The industry currently generates US$6.5bn and serves 40% of the world market. There are a number of large-scale domestic projects in the pipeline; the most significant being the joint project between Denmark’s largest energy firm Dong Energy along with pension fund PensionDanmark. The two entities are to build a 400 MW offshore wind farm between the island of Anholt and Djursland. The project will provide 4% of Denmark’s renewable consumption.

“From the Swedish automobile industry to Danish wind energy to Norwegian energy initiatives, the Scandinavian region has reached a point now where the goods it produces are in high demand across the world.”

Bengt Ellow, Experia Corporate Finance

Deal Focus

Scandinavia

Countries: Norway, Sweden, Denmark
Population: 24,784,800
Area: 12,166,85 sq km
Time zones: GMT +1 to +2

“From the Swedish automobile industry to Danish wind energy to Norwegian energy initiatives, the Scandinavian region has reached a point now where the goods it produces are in high demand across the world.”

Bengt Ellow, Experia Corporate Finance
Home to the longest coastline in Europe and considerably larger than the traditional wind farm states of Denmark or northern Germany, Norway has vast untapped offshore wind power potential. According to the Energy Council, offshore wind power will make up 40 TWh of Norway’s renewable energy by 2025. In 2009 Norway’s Statoil and France’s Technip partnered to build the first large capacity floating wind turbine. The floating turbine sub-sector remains an interesting prospect as it is already competitively priced and can be installed far from the coast where wind flow is unhindered by terra firma and is therefore more constant.

Although onshore wind in Sweden is expanding at a rapid pace its offshore variant is almost nonexistent with only 165 MW total installed capacity to date. In late 2010 the Swedish authorities approved planning permission for an unnamed German wind power firm to build a 265 MW offshore wind farm 11 miles off the coast of Söderhamn. Construction is planned to commence within 18 months and should signify a new trend in large-scale offshore developments in Sweden.

**Mid-market private equity taps into energy efficiency market**

In September 2010 one of Europe’s leading mid-market private equity firms Palamon Capital Partners acquired a majority stake in Eneas Energy AS for a sum of US$64m. Eneas provide a variety of services in the energy efficiency spheres and is one of the market leaders in their field in the Nordic region.

The deal is representative of a growing number of mid-market private equity firms branching out of their conventional investment models into sectors associated with industrial cleantech as well as cleantech consulting, logistics and financing services.

**Cleantech backbone of economic growth**

A comprehensive policy mix along with a propensity towards innovation should ensure that cleantech will continue to play a major role in driving the Nordic economies. One should look no further than Denmark, where cleantech has been its fastest export growth sector for the past two years and the pace of this export growth is expected to more than quadruple over the next five to six years. Owing largely to the above factors, we see no reason why the recent upsurge in cleantech M&A should stop.

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<td>Triventus AB</td>
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<td>TrenderEnergi Invest AS</td>
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<td>Domsjo Fabriker AB</td>
<td>Biofinery and specially cellulose company</td>
<td>The Aditya Birla Group (India)</td>
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<td>Mar 11</td>
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<td>Waste recycling company</td>
<td>Alter Fund III GP Limited</td>
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<td>Sep 10</td>
<td>Eneas Energy AS (Majority Stake)</td>
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<td>Sep 10</td>
<td>Ekses Windpower AB,</td>
<td>Windpower</td>
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<td>Jun 10</td>
<td>Kommunekemi a/s</td>
<td>Wastewater</td>
<td>EQT Infrastructure Fund (UK)</td>
<td>52</td>
</tr>
</tbody>
</table>

**Electricity Certificate System (Sweden)**

- Initially introduced in 2003, the Electricity Certificate System was revised in 2007 with the objective of increasing renewable production to 17 TWh by 2016. 1 Mwh equals one certificate which can be traded on the Nordic Power Exchange. Has promoted green investments into Sweden.

**Green car tax exemption (Denmark)**

- Denmark exempts vehicle purchase tax for electric vehicles (equivalent to an exemption of 105% of the car value below DKK 76,500 (US$14,400), and 180% of the car value above this. Electric cars also have an exemption from the annual registration fee of between US$95 to US$1900. The tax breaks have attracted a number of auto manufacturers to the country’s market.

**Feed-in-tariff (Norway)**

- In 2008 the state introduced feed-in-tariffs for renewables. Producers of electricity using regionally undeveloped technologies such as biomass receive US$0.2 kWh, whilst wind power producers receive US$0.15 per kWh and hydropower producers receive US$0.07 kWh.
One of the most high-profile transactions was Spanish electricity giant Iberdrola SA’s acquisition of the remaining shares it does not already own (20% approximately) of Iberdrola Renovables SA, its listed renewable energy arm for US$5.3bn. The deal, announced on March 2011, demonstrates Iberdrola’s strong focus on renewable assets and highlights the role the company is taking as a leading consolidator within the renewable energy market. Iberdrola has also been directing its attention offshore: In late 2010 it announced its intention to invest US$6.9bn into UK cleantech over the next two years. Its primary focus will be on smart grids, carbon capture and wind farms such as the 7.2 GW offshore farm off the coast of East Anglia.

Regressive government policies may facilitate sub-sector growth

Conducive market conditions along with favourable government policies have seen the number of renewable energy facilities grow from 1,778 in 2000 to 57,504 in 2010. A number of initiatives like the aggressive feed-in-tariffs have helped position Spain as one of the world’s biggest producers of renewable energy. Recently, policy makers put through various changes in legislation clearly aimed at slowing down investments in certain renewable sectors such as solar PV due to its high costs. As a result, other cleantech sub-sectors like waste management, recycling and energy efficiency are emerging at the forefront of Spain’s green industries.

M&A activity

Excluding the mega deals involving Endesa, Acciona, and Enel during 2009-2010, both the volume and value of cleantech transactions involving Spanish targets has been declining since 2008. This can be attributed to the deteriorating macroeconomic environment and the increasingly budget conscious attitude towards green initiatives by the government. The volume and value of cross-border cleantech transactions involving targets in Spain has also been decreasing for the same reasons. There is an indication that deal volume will start to recover to pre 2010 levels judging by the H1 2011 numbers. Moreover, 2011 has seen average deal value shoot up thanks to a string of large deals.
Looking overseas to invest

Big Spanish construction groups like FCC, Ferrovial and ACS have been diversifying away from the construction sector and entering into new business areas with environmental services being top of their agenda. They are also increasingly interested in diversifying geographically with the belief that a growing proportion of their growth will occur outside of Spain.

A fiscally weak state equates to an undermined public sector. This is of particular importance because for firms in certain cleantech sub-sectors, public agencies are their principle client; waste management serving local municipalities being a good case in point. As a result, we expect to see an increasing amount of cross-border deals involving Spanish buyers in the waste management sector, similar to the last one performed by Ferrovial when it acquired Donarbon Limited, a UK based waste management company in September 2010.

Consolidation and outbound deals will characterise future M&A

Although there are major players in cleantech like the listed Gamesa or Abengoa or the environmental services divisions of some of the main construction holdings, the general market is highly fragmented with hundreds of small players with revenues below US$20m. Continued consolidation in the domestic market is therefore highly probable.

Inbound M&A may increase over the coming few years as foreign companies, after a period focused on restructuring and cost cutting and allowing for excess cash to build up on their balance sheets, start to assess how macroeconomic indicators develop. Spain could be perceived to be a country with reasonable valuations as well as being a strategic launch pad into Latin-America.

Wind power giant Gamesa has been shifting its attention to new markets of late. In April 2011 it signed an agreement with Chinese wind player Longyuan to jointly develop a new 200 MW wind farm in China. Its project portfolio now totals 2.9 GW in China and 22.6 GW worldwide. Indeed, the more restrictive government policies towards renewable energy and the sustained troubles facing domestic financial institutions should make outbound M&A activity predominate in the near future with Brazil, China, the UK and the US being the most attractive propositions.

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<td>Jantus SL</td>
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<td>CPFL Comercializacao 973 (Brazil)</td>
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<td>Mar 11</td>
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<td>Grupo Agbar</td>
<td>Water and sewage services</td>
<td>GDF Suez SA (France)</td>
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<td>Dec 10</td>
<td>PET Compania Reciclado SA</td>
<td>Recycling of plastics</td>
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<tr>
<td>Jun 10</td>
<td>Biomasa Fuente de Piedra SAU</td>
<td>Biomass electricity</td>
<td>Neolecra SA (France)</td>
<td>30</td>
</tr>
<tr>
<td>Jun 10</td>
<td>Parque Eolico La Pezuela SL</td>
<td>Wind power plants</td>
<td>Energie Gesellschaft (CH)</td>
<td>12</td>
</tr>
<tr>
<td>Jun 10</td>
<td>Isoloton SA</td>
<td>Solar panels manufacturer</td>
<td>Toptec Company (South Korea + Spain)</td>
<td>45</td>
</tr>
<tr>
<td>Feb 10</td>
<td>Hersen Cinco SL</td>
<td>Recycling company</td>
<td>Mauser AG (Germany)</td>
<td>n/d</td>
</tr>
<tr>
<td>Jan 10</td>
<td>Aldesa Construcciones SA</td>
<td>Solar PV power plants</td>
<td>NIBC, Ampere (Netherlands)</td>
<td>27</td>
</tr>
</tbody>
</table>

Government support

Real Decreto-ley

- In an attempt to reduce the “tariff deficit” (the difference between the government fixed price for electrical power and the cost of generating it), Spanish policy makers introduced a cap on the previously established solar PV feed-in-tariffs.
- The effect on M&A should be mixed. Positive as investors, seeing how their internal rate of return is decreasing, might start to look for an exit, and negative because it introduces uncertainty and a distinct lack of confidence in the Spanish renewable energy market.

PNIR

- PNIR, otherwise known as the National Integrated Plan for Waste Materials, started in 2008 and is set to run until 2015.
- Its purpose is to reduce the amount of waste generated and to increase reutilisation and recycling rates. The implementation of the plan should gradually drive growth in areas such as recycling and waste to energy which should subsequently have a positive effect on M&A.
“Given that 40% of Europe’s wind energy blows across the UK, the wind industry is likely to dominate cleantech investment flows here for the next 20 years. Other industries, such as waste recycling and energy recovery, are also hugely important.”

Mark Wilson, Catalyst Corporate Finance

Legislation driving deals

Rising inflation and lower than expected growth has led to a crisis in confidence in the UK recovery. Interestingly, the UK economy has been greatly influenced by (EU and UK) cleantech legislation over the last five years, ensuring that even in a slow growth environment, deals are still being completed. For example, the introduction of the UK’s feed-in-tariff (FIT) programme in April 2010 was a catalyst for Carillion’s acquisition of Eaga, the largest deal of 2011 so far, at US$493m and roughly 6.8x this year’s EBIT.

Eaga is poised to deliver a mass roll out of solar PV to the social housing community, approximately 320,000 homes this year. In late January they announced that they had secured US$97m of SPV equity funding through the HSBC Environmental and Barclays European Infrastructure Funds to facilitate this. As a proven deliverer of complex national installation programmes, Eaga was an attractive target for Carillion, a leading support services business, which has the balance sheet strength to help Eaga fully capitalise on the FIT programme. Similar businesses such as Keir have also been acquisitive in the PV roll out space.

M&A activity

Wind industry evolving

The wind industry is the most developed and mature of the renewable energy sectors in the UK and is poised for over US$160bn of investment in the offshore sector as well as continued investment onshore. During the past 12 months a number of assets have changed hands, with Infinis plc, the Terra Firma Capital Partners backed renewable industry consolidator, acquiring onshore wind farms from both Scottish & Southern and E.ON during 2011.

Whilst the North Sea oil & gas industry is primary to the UK energy sector, we have seen a range of traditional oil and gas service businesses acquire renewable capabilities in anticipation of the growth in non carbon derived energy. At the end of 2010, Aberdeen-based John Wood Group acquired a stake in SgurrEnergy, the specialist renewable energy consultant combining offshore experience with wind, wave and tidal expertise. In 2009, the more established Bristol-based Garrad Hassan Group, and recognised authority on wind especially with the funding community, was acquired by Germanischer Lloyd AG, the German maritime and oil & gas consultant.

Despite the growth expected across the wind supply chain, there are very few British manufacturing businesses of any scale remaining, most having been acquired by overseas buyers. Blades, turbines and transmission systems are almost entirely supplied by European manufacturers. We are however beginning to see the emergence of British wind service companies.

Waste industry slowly reconfiguring

As economic activity has strengthened, many waste businesses have seen their volumes and resulting trading figures improve, helped by increasing global recyclate prices (especially paper and plastics). Investment in recycling and treatment operations continues to stimulate M&A activity. Last July, Biffa acquired the recycling-led...
Greenstar UK for US$218m to grow its recycling footprint. Also, Viridor acquired private equity backed Reconomy Recycling Solutions (RSS) for US$39m, a business which processes 250,000 tonnes of material a year through three materials recycling facilities (MRFs).

The industry is also experiencing increased vertical integration as manufacturers secure recycled ‘raw materials’ at source. Spanish paper manufacturer SAICA, who are building a US$480m paper mill in Manchester, secured over 450,000 tonnes of paper annually for the mill through the acquisitions of Futur Recycling, Cutts Recycling and Stirling Fibre.

Funders selective about clean technology investments

There is no shortage of clever ideas in the UK for cutting carbon emissions, saving energy and commercialising low carbon technologies. There is however limited capital to fund these (often pre-revenue) businesses or renewables projects and attracting either equity investment or debt financing remains difficult. Uncertainty around long term fiscal incentives have also complicated investment decisions, as evident this March when the Government scaled back some of the FIT subsidies to avoid ‘solar farms’ emerging.

A number of venture and cleantech funds as well as corporate venturers have however been supportive of the industry. In June, the Carbon Trust, a Government backed fund, invested in ACAL Energy, a developer of unique fuel cell technology along with Sumitomo Corporation and Solvay. This round is expected to allow the business to demonstrate the technology at a prototype level and precedes full scale commercialisation.

Factors stimulating future cleantech M&A

As landfill taxes further escalate the UK waste industry will continue to invest in recycling and treatment operations, often through M&A.

A strengthening banking system will mean that funding for cleantech businesses will become easier, especially once the FIT and various other state programmes become more established and the industry matures. Moreover, a combination of better underlying trading and more sustainable profit forecasts and RHI buys having more free cash and banking headroom is likely to further stimulate M&A in 2012.

Recent transactions

<table>
<thead>
<tr>
<th>Date</th>
<th>Target</th>
<th>Description</th>
<th>Acquirer</th>
<th>Deal Value (US$m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun 11</td>
<td>ACAL Energy</td>
<td>Fuel Cell systems</td>
<td>Carbon Trust, Solvay, Sumitomo</td>
<td>6</td>
</tr>
<tr>
<td>May 11</td>
<td>Eneccys</td>
<td>Inverters for solar</td>
<td>Climate Change Capital</td>
<td>26</td>
</tr>
<tr>
<td>Apr 11</td>
<td>3 wind farms</td>
<td>Wind farms (96MW)</td>
<td>Infinis Plc</td>
<td>173</td>
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<tr>
<td>Feb 11</td>
<td>Esga plc</td>
<td>Renewable and energy efficiency</td>
<td>Cartilion Plc</td>
<td>306</td>
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<tr>
<td>Dec 10</td>
<td>Clipper Windpower plc</td>
<td>Manufacturer of wind turbines</td>
<td>United Technologies Corp (USA)</td>
<td>69.9</td>
</tr>
<tr>
<td>Nov 10</td>
<td>Aquamarine Power</td>
<td>Provider of wave and tidal energy</td>
<td>ABB (Switzerland), Scottish &amp; Southern</td>
<td>11</td>
</tr>
<tr>
<td>Nov 10</td>
<td>Beco</td>
<td>Installation photovoltaic (PV)</td>
<td>Kier Group Plc</td>
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<tr>
<td>Oct 10</td>
<td>Futur Recycling</td>
<td>Recycling of waste paper</td>
<td>SAICA (Spain)</td>
<td>n/d</td>
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<tr>
<td>Sep 10</td>
<td>SgurEnergy</td>
<td>Renewable energy services</td>
<td>John Wood Group Plc</td>
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<td>Jul 10</td>
<td>TEG Perth</td>
<td>Anaerobic digestion (AD) plant</td>
<td>Albion Ventures LLP</td>
<td>3</td>
</tr>
</tbody>
</table>

Government support

Renewable Obligation Certificates (ROC)

- The certificate scheme was enacted to dramatically incentivise renewable generation.
- An energy supplier receives one ROC for every 1 Mwh generated from a renewable source. If it generates more than it is obliged to, the supplier is able to sell its excess ROCs to energy companies who have failed to meet their renewable obligation. The current pricing system is 1 Mwh = US$59.
- Has arguably been the principle mechanism for stimulating UK renewable energy investments. ROC will run until 2037.

FIT (Feed-in-tariffs)

- Mandated under the powers of the Energy Act 2008, the feed-in-tariffs scheme was launched in 2010.
- It requires the UK’s largest energy suppliers to make regular payments to communities, businesses and households who generate their own electricity from renewable or low carbon sources such as solar electricity panels or wind turbines.
- The premium, which is for power generators of up to <5 MW, will run until 2023. The initiative has so far had a discernable impact on cleantech M&A.
Mergers Alliance is a group of award winning corporate finance specialists who provide high quality advice to organisations who require international reach for their M&A strategies. Over the past 12 months our partner firms have collectively completed over 100 deals, in 30 countries worldwide with an aggregate value of over US$3 billion.

<table>
<thead>
<tr>
<th>Australia</th>
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<tr>
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</table>

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Mergers Alliance cleantech transactions

- Advisor on Development Capital of Atlantic Energias Renováveis S.A
  Brazil

- Advisor on Development Capital of Bowersock Mills & Power Company, LLC to CIMC
  USA

- Sale of CEPAration to Hyflux
  Netherlands / Singapore

- Sale of Marubeni Sustainable Energy to Korea East-West Power Company
  USA / South Korea

- Acquisition by SAICA of Futur Recycling
  Spain / UK

- Sale of Gaia Gestao Ambiental to Haztec Tecnologia e Planejamento Ambiental S.A
  Brazil

- Acquisition by Areva of PN Rotor GmbH
  France / Germany

- Sale of Tritronics Private Limited to Luminous Power Technologies
  India

- Advisor on Project Finance of Nisan Enerji
  Turkey

- Sale of White Rose Environmental to Stericycle Inc
  UK / USA

- Acquisition by SAICA of Cutts Recycling
  Spain / UK

- Advisor on Development Capital of Inovasol
  France
International corporate finance

Australia       Finland       Poland
Austria          France         Russia
Belgium          Germany        Singapore
Brazil           India          South Africa
Bulgaria         Italy           Spain
Canada           Japan           Sweden
China            Luxembourg      Switzerland
Colombia         Mexico          Turkey
Czech Republic   Netherlands     UK
Denmark