THE EUROPEAN RENEWABLE ENERGY INVESTOR LANDSCAPE

Global Capital Finance
About the Research

This report analyses the strategies, return requirements and activities of the main investor classes in Europe’s renewable energy sector. It was written by Global Capital Finance in collaboration with Clean Energy Pipeline. All transaction data used in this report is based on deals tracked in Clean Energy Pipeline’s deal databases.
The renewable energy market has come of age. For the first time it looks likely that renewable energy investments will exceed traditional power generation investments in the coming years. Rising from humble beginnings, initially often politically motivated, the industry has grown to be a major force throughout the world.

There are many obvious reasons for this, not least the broad recognition that we have to preserve our natural resources. In addition, many projects are now being developed on economic merit alone without subsidies. However, we believe one of the most important factors driving growth in this sector is the improvement of professional standards in the industry.

While small onshore wind farms, local biomass plants and solar PV plants can often be completed with basic engineering skills, more complex, larger plants require major engineering capabilities. Compared to an onshore wind farm, an offshore wind farm looks very challenging, but compared to offshore drilling, it looks very manageable. With larger transactions it is also possible to apply financial structuring techniques, and now, after appropriate professional standards have become common, even smaller transactions can be executed more efficiently.

While Global Capital Finance remains active in all subsectors of infrastructure, renewable energy has been our strategic focus since 2005. Overall we have completed more than 50 asset based M&A transactions with a total value in excess of €3 billion covering wind, offshore wind, solar PV, biomass, waste to energy and hydroelectric power plants.

We advise developers who are seeking equity and debt, sellers during the divestiture process, and investors during the acquisition process worldwide, but the core of our business remains Europe.

European investors were first to embrace the opportunities in the sector. Today, investments in renewable energy assets are widely accepted by institutional investors as a sensible portfolio component combining low risk and attractive returns. In the more mature European markets there is already significant secondary sales activity. Sure, there are growing pains and changing regulatory frameworks, but ultimately there will be a professional, stable and mature market for many years to come. The path to sustainability is irreversible.

We very much appreciate the contribution of the interviewees and Clean Energy Pipeline to this report. We hope you find it interesting and we welcome your feedback.

Juergen Moessner
President, Global Capital Finance
EXECUTIVE SUMMARY

In this report, we aim to outline the diversity of investors active in the renewable energy sector across Europe. Furthermore, we will provide a deeper analysis of Germany, Scandinavia and the UK - three major renewable energy markets with very different investment dynamics.

A diverse pool of investors is active in renewable energy. Broadly speaking, investors can be segmented based on their risk appetite (technology, country, and asset stage), return expectations (IRR and yield), holding length, and level of engagement.

Large utilities were the first to invest in renewable energy. Their initial investments typically involved utility-scale projects and often involved acquisitions. However, in the past three years, Europe’s major utilities have suffered due to an increase in the volume of renewables in the energy mix, which has put downward pressure on prices. Utilities are responding in different ways, but many are selling large shares in their portfolios of operating assets to de-lever their balance sheets.

The much smaller municipal utilities, which are primarily located in Germany and Switzerland, are also very active investors. Driven by political and consumer pressure, many municipal utilities have targets to source 100% of their energy from renewable sources. Municipal utilities initially acquired operating assets, but have recently altered their investment strategy to build partnerships with developers, giving them exposure to a larger pipeline of projects.

Independent Power Producers (IPPs) have also grown to become prominent investors in renewable energy. Some are traditional fossil fuel IPPs that have diversified into renewable energy, while others have transformed from developers into de facto IPPs though retaining ownership of assets once operational. IPPs typically have a strong operational involvement in their assets, but are very diverse in their geographical scope and risk appetite.

While not their core area of focus, Japanese trading houses and OEMs (Original Equipment Manufacturer) have significantly ramped up their renewable energy investment activities in the past three years to accelerate their industrial strategies. Trading houses have typically invested in renewable energy assets to gain experience and build supply chains in certain markets, while OEMs have invested in projects to support equipment sales.

Infrastructure and private equity funds were amongst the earliest investors in renewable energy. Both types of funds typically have the same sponsors but have very different investment strategies. While infrastructure funds are focused on stable yields, and thus invest only in operating assets deploying mature technologies in stable countries, private equity funds seek higher returns, and thus assume greater risk by investing during the development and construction stage.
Driven by strong political will and consumer acceptance, **Germany** is the largest renewable energy market in Europe. The rapid build out of renewable energy capacity was boosted by long-term feed-in tariffs and cheap, state-backed project finance. Germany is also home to many strong industrial players, including OEMs and construction companies. The attractive market conditions resulted in a significant influx of capital and a deterioration of project returns. The new EEC law will continue to support the industry, but might lead to somewhat higher risk, hence more reasonable growth and higher returns.

**The UK** is home to the world’s largest offshore wind market, although new investment has recently slowed due to uncertainty in how the Electricity Market Reform will be implemented. That said, investment in onshore wind and solar PV continues to be strong. There is an abundance of equity finance available from EIS (Enterprise Investment Scheme) and quoted fund structures, as well as the many infrastructure and private equity funds located in London.

**Scandinavia** has also become a hotbed of renewable energy investment given the country’s political stability, and the abundance of renewable resources. There are many regional markets within Scandinavia, which leads investors to typically specialize in one market, such as the Nordpool electricity market, the largest in Scandinavia.

**Pension funds and insurance companies** are also investing directly (or co-investing) in this sector. The majority focus on operating assets, although some invest at the construction stage if a full EPC wrap is in place. Pension funds and insurance companies have been attracted to renewable energy due to the low yields offered by bonds and the volatile equity markets. These investors need large ticket sizes and have a long-term holding strategy.

The latest category of investors to enter the renewable energy market are **YieldCos and closed end funds**. This has been underpinned by the high level of demand for more liquid investment vehicles in this sector, and continuing low yields on traditional bonds. YieldCos disburse a high volume of profits from electricity sales to shareholders through dividends. Yields are often linked to inflation.

While investor classes employ different strategies, they all focus on countries with stable financial support mechanisms, and no perceived risk of retroactive cuts. The three regions that have managed subsidy alterations in the best way are Germany, the UK, and Scandinavia.
The appetite of Europe's major utilities to invest in renewable energy cannot be fully understood without an appreciation of the many long term challenges to their business models. With their large fleets of fossil-fueled generation capacity, many are grappling with the issues of the finiteness of natural resources and CO2 emissions penalties. The significant influx of renewable energy on the grid, and, more specifically, the privileges renewables enjoy in terms of priority grid access, is also decreasing the competitiveness of traditional fossil-fueled generation by exerting downwards pressure on wholesale power prices. These challenges are compounded by growing competition from new market entrants in the form of municipal utilities, IPPs and financial investors, a trend initiated by energy market liberalisation in the mid 1990s.

As a result of low wholesale power prices, utilities have struggled to meet their long-term objectives of stabilising profit margins and production costs. This has led to many utilities reporting significant net losses, necessitating large-scale lay-offs and cost cutting. Indeed, European utilities have shut about 50 GW of coal and gas-fired capacity in the past six years.

With their business models on the line, political pressure is growing in support of unprofitable fossil-fueled generation to ensure that back-up power generation is in place when renewable energy projects are not generating. However, whatever support may be offered, there is no escaping the fact that utilities are facing increasing pressure from rating agencies to shorten their balance sheets in order to avoid downgrades and the resulting increase in funding costs. This has spurred utilities to aggressively divest stakes in renewable energy assets. According to deals tracked by Clean Energy Pipeline, European utilities announced 48 divestments of renewable energy projects totaling $7.2 billion in 2013, compared with 27 divestments totaling $3.6 billion in 2011. Notable divestments are shown in the table below.

<table>
<thead>
<tr>
<th>Seller</th>
<th>Assets sold</th>
<th>Stake divested</th>
<th>Enterprise value</th>
<th>Acquirer</th>
<th>Date announced</th>
</tr>
</thead>
<tbody>
<tr>
<td>DONG Energy A/S</td>
<td>210 MW Westermost Rough offshore wind farm</td>
<td>50%</td>
<td>€581 million</td>
<td>Marubeni, UK Green Investment Bank</td>
<td>Mar-14</td>
</tr>
<tr>
<td>RWE</td>
<td>576 MW Gwynt y Môr offshore wind farm</td>
<td>10%</td>
<td>€266 million</td>
<td>UK Green Investment Bank</td>
<td>Mar-14</td>
</tr>
<tr>
<td>DONG Energy A/S</td>
<td>630 MW London Array offshore wind farm</td>
<td>25%</td>
<td>€3.1 billion</td>
<td>La Caisse de dépôt et placement du Québec</td>
<td>Jan-14</td>
</tr>
<tr>
<td>GDF Suez SA</td>
<td>Futures Energies Investissement Holding (subsidiary of GDF Suez), which operates 440 MW of installed onshore wind capacity</td>
<td>50%</td>
<td>Undisclosed, although will enable GDF SUEZ to reduce its net debt by some €400 million</td>
<td>Predica (subsidiary of Crédit Agricole Assurances)</td>
<td>Dec-13</td>
</tr>
<tr>
<td>EDF</td>
<td>144 MW Fallago wind farm</td>
<td>Majority</td>
<td>Undisclosed</td>
<td>Hermes GPE</td>
<td>Dec-13</td>
</tr>
<tr>
<td>GDF Suez SA</td>
<td>National Power International Holdings B.V. (GDF Suez's Portuguese thermal and renewable energy assets, which has a combined capacity of 3.3 GW)</td>
<td>50%</td>
<td>Undisclosed</td>
<td>Marubeni Corp</td>
<td>Aug-13</td>
</tr>
</tbody>
</table>
### Notable divestment by European utilities (continued)

<table>
<thead>
<tr>
<th>Seller</th>
<th>Assets sold</th>
<th>Stake divested</th>
<th>Enterprise value</th>
<th>Acquirer</th>
<th>Date announced</th>
</tr>
</thead>
<tbody>
<tr>
<td>DONG Energy A/S</td>
<td>Kraftgården AB, owner of seven hydro plants along the Swedish river Indalsälven with an overall capacity of 626 MW</td>
<td>26%</td>
<td>€2.4 billion</td>
<td>Voimapiha</td>
<td>Aug-13</td>
</tr>
<tr>
<td>EDF</td>
<td>56 MW portfolio of solar PV farms</td>
<td>50%</td>
<td>Undisclosed</td>
<td>Mitsubishi Corp</td>
<td>Aug-13</td>
</tr>
<tr>
<td>DONG Energy A/S</td>
<td>DONG Energy’s Danish onshore wind business, which operates 196 MW of operating across 80 locations and a 23 MW development stage project</td>
<td>100%</td>
<td>€102 million</td>
<td>SE, PFA</td>
<td>Jun-13</td>
</tr>
<tr>
<td>GDF Suez SA</td>
<td>IP Maestrale Investments (GDF Suez’s Italian wind business, which has a capacity of 636 MW)</td>
<td>80%</td>
<td>€859 million</td>
<td>ERG SpA</td>
<td>Feb-13</td>
</tr>
<tr>
<td>Iberdrola SA</td>
<td>Iberdrola Renewables Polska (Iberdrola’s Polish renewable energy business, which operates a 184.5 MW portfolio of five wind farms and a development pipeline)</td>
<td>75%</td>
<td>€271 million</td>
<td>Energa, Polska Grupa Energetyczna (PGE)</td>
<td>Feb-13</td>
</tr>
<tr>
<td>DONG Energy A/S</td>
<td>DONG Energy’s Polish onshore wind business, including 112 MW of operating capacity, 220 MW of construction stage projects and 555 MW of pre-construction stage projects</td>
<td>100%</td>
<td>€231 million</td>
<td>Energa, Polska Grupa Energetyczna (PGE)</td>
<td>Feb-13</td>
</tr>
<tr>
<td>SSE plc</td>
<td>79.5 MW portfolio of onshore wind farms</td>
<td>100%</td>
<td>€163 million</td>
<td>Greencoat Capital</td>
<td>Feb-13</td>
</tr>
<tr>
<td>EDF</td>
<td>55 MW Toul-Rosieres solar PV project</td>
<td>50%</td>
<td>Undisclosed</td>
<td>Mitsubishi Corp</td>
<td>Jan-13</td>
</tr>
<tr>
<td>Iberdrola SA</td>
<td>Iberdrola Renovables France (operating 32 onshore wind farms in France totalling 321 MW)</td>
<td>100%</td>
<td>€400 million</td>
<td>MEAG (asset management arm of Munich Re), General Electric, EDF Energies Nouvelles</td>
<td>Dec-12</td>
</tr>
<tr>
<td>E.ON</td>
<td>E.ON Energy from Waste</td>
<td>51%</td>
<td>Undisclosed</td>
<td>EQT</td>
<td>Dec-12</td>
</tr>
</tbody>
</table>

Note: The above table only shows divestments of large portfolios of renewable energy assets. It does not include the many divestments of individual projects.

Source: Clean Energy Pipeline
In addition to the examples shown above, many other large divestments are in the pipeline. In November 2013, it was reported that E.ON is seeking to sell its Italian business, with 6.1 GW of operating capacity, including 328 MW of wind, 46 MW of solar and 531 MW of hydro. Three months later, it was reported that EDF plans to sell 70% of its Italian subsidiary’s 600 MW of operating wind assets.

**Investment criteria**

With a wealth of experience in developing, constructing, and operating energy infrastructure, European utilities enjoyed a natural advantage and were amongst the very first investors in renewable energy infrastructure. In order to take advantage of the rapidly evolving renewable energy sector, many utilities established subsidiaries dedicated to developing large-scale renewable energy projects. RWE formed RWE Innogy, E.ON established E.ON Renewable Energy, and EDF created EDF Energies Nouvelles.

Putting aside the current trend of utilities divesting renewable energy assets to bolster balance sheets, utilities will likely be the long-term owners of renewable energy assets, particularly in regulatory systems such as the UK, Scandinavia, and Spain, where renewable generation is competing in market-like scenarios with conventional energy.

Given ongoing subsidy reductions, utilities consider renewable energy investment and acquisition opportunities based on costs per KWh generated instead of subsidy-derived returns.

**Investment strategy**

**Return expectations:** In line with market expectations, but are able to price high cost projects more favourably when long-term contracts are in place allowing them to implicitly price projects on much longer time horizons.

**Investment stage:** All stages, although many are most active at the development stage.

**Holding length:** Long-term holders, as assets are needed to satisfy the demand of their own customer base. Early divestments are undertaken when needed for deleveraging purposes.

**Level of engagement:** Minority holdings, which allow off-balance sheet treatment of the project companies, are preferred.

**Geographic focus:** Diversified

**Sector focus:** Onshore wind, offshore wind & solar PV.
Over the past five years, municipal utilities have gradually increased their investment allocation in renewable energy and are now amongst the most active investors in this sector. Their involvement increased significantly following the liberalisation of the energy markets aimed at increasing competition in the late 1990s.

Renewable energy investments enable municipal utilities to diversify and expand their generation portfolio and target a highly saturated energy market through innovative green energy offerings. As they are directly or indirectly owned by a municipality or city, municipal utilities are also often politically motivated to invest in renewable energy. They were further motivated to invest in renewable energy by the introduction of nuclear phase-outs and renewable energy generation targets in markets such as Germany and Switzerland. Consequently, many municipal utilities have adopted 100% green energy targets.

Despite these drivers, municipal utilities were slower to enter the renewable energy market than large utilities and other financial investor groups. Swiss municipal utilities were the first of their kind to target renewable energy investments, and more recently German, Austrian and even Norwegian utilities have become more active.

“Swisspower Renewables is owned by eleven shareholders that are municipal and town utilities,” explains Felix Meier, CEO of Swisspower. “They invest because they are contributing to the country’s Energiewende master plan, which will replace nuclear facilities with renewable energy by 2050. The smaller and midsize towns can’t do this by themselves, so they search for vehicles such as ourselves to participate. The strategy is to invest in and around Switzerland in onshore wind and hydro. We can build projects but do not develop, so we need projects that are already permitted.”

The investment capacity of municipal utilities varies significantly depending on their general financial strength and the number of customers they serve. Some municipal utilities have also secured funding from the municipality or city. Swiss municipal utilities in particular are financially strong due to their traditional pump storage business.

In Germany, many municipal utilities have established joint ventures with developers that provide access to a project pipeline below market prices, and avoid the need to partake in auction processes with low transaction certainty and high transaction costs. For example, Mainova has formed a joint venture with ABO Wind, Stadtwerke München with wpd, and Trianel with Energiekontor. In some cases, the municipal utility has also acquired a minority stake in the developer. These partnerships are also beneficial to the developer since they add a strong financial partner sharing risks and costs.

In countries such as Norway, municipal utilities are the most active project developers, negating the need for any development partnership. In such countries, municipal utilities will often seek financial partners to share development costs.

**Investment strategy**

- **Return expectations:** 7%-9% p.a. after tax.
- **Investment stage:** All stages, although many are most active at the development stage.
- **Holding length:** 20-30 years – municipal utilities prefer a buy-and-hold strategy; long land leases providing repowering potentials are preferred.
- **Level of engagement:** Many will undertake project development in collaboration with an experienced developer. In some cases, municipal utilities will acquire stakes in project developers.
- **Ticket size:** €5-20 million, although many have formed joint investment vehicles enabling them to invest larger sums and compete with major utilities. Examples include Swisspower, Terravent, Trianel and Energie Allianz Bayern.
- **Geographic focus:** Prefer to invest where their customer base is located, although this is often not possible given a lack of investment opportunities. Therefore, municipal utilities are often forced to divert to other countries to meet their targets. For example, many Swiss municipal utilities have invested in renewable energy projects in France, Germany, Italy, and to a lesser extent, in Spain and Norway.
- **Sector focus:** Technologies with high capacity factors and low levelized energy costs are preferred, with the majority of capital allocated to onshore wind. Municipal utilities have invested in solar PV projects in the past two years due to declining costs. Other technologies are targeted on an opportunistic basis.
- **Use of leverage:** Moderate or no leverage.
Independent Power Producers (IPPs) develop, build and operate power plants. Power generated from these assets is typically sold into the network or, in some cases, directly to large users through PPAs. Unlike utilities, IPPs typically do not own transmission or distribution assets and do not sell electricity directly to retail or other small consumers. Broadly speaking, there are two different types of IPP:

1) **Traditional IPPs with fossil fuel backgrounds**

These companies started with a portfolio of fossil fuel power plants and added renewable energy assets to diversify their portfolio, to seek higher returns and to meet specific demands for green energy.

Traditional IPPs must cope with the different nature of operating renewable energy assets that are intermittent, often smaller scale, and in remote locations. This creates risks of asset underperformance and excessive operating costs, resulting in lower returns.

2) **Renewable energy project developers**

In many cases, renewable energy project developers do not divest their assets once fully permitted or constructed (a build-own-transfer-model). Instead, they keep all of the operating assets on balance sheet or divest minority stakes to financial investors. Many also build O&M capabilities. As such, these developers have become de facto IPPs.

For these IPPs, there are significant financing risks. Projects in development have an inherently higher risk profile than operating assets, resulting in a higher cost of capital. When revenues are lower than expected due to, for example, construction delays or low wind yields, cumulated debt service can quickly be put at risk. This requires careful asset liability management strategies.

The extent to which IPPs take development-stage risk determines the countries they are active in. For example, project developers currently find it very difficult to secure adequate returns in mature markets such as Germany. “We are not covering Germany as closely as we were previously, mainly because the best locations have already been developed,” explained Jerome Gautrais, Head of M&A at Theolia. “It is extremely difficult and complicated to find new opportunities. As a developer, constructor and operator, we are facing stiff competition in Germany from private equity funds and long-term institutional investors, which we can’t compete with. So in Germany, we are focusing on delivering our O&M expertise to underperforming assets.”

However, IPPs that build their portfolios through acquiring operating and construction-stage assets are still keen on mature markets due to their stable regulatory regimes. “We are active in Germany, Italy, and France,” confirmed Thomas Schnorrenberg, IR and PR Manager at Capital Stage. “We love these markets because they all have a feed in tariff and are politically stable, meaning we don’t expect retroactive changes like we saw in Spain. This is the worst thing an investor could imagine.”

**Investment strategies**

- **Return expectations:** Varied – some have a high-risk / high IRR strategy targeting emerging markets. Others only target assets in mature markets with a FiT or PPA in place.
- **Investment stage:** Primarily greenfield projects, although some acquire secondary projects at various stages of development. Some also buy operational assets and create value through operating synergies with other assets in the portfolio.
- **Level of engagement:** Typically seek controlling stakes. Some will divest stakes in projects once operational.

“The returns we target depend very much on the market,” explained Thomas Schnorrenberg, IR and PR Manager at Capital Stage. “Germany is the most risk-free market because we are very experienced there and it is a very stable market. Our portfolio, totaling 240 MW, has an average IRR of 10% after tax. For new projects in Germany the IRR is a little bit less, maybe 8%-9%. For Italy, where there is a slightly higher risk, we expect 12% IRRs.”
We are active in Germany, Italy, and France. We love these markets because they all have a feed in tariff and are politically stable, meaning we don’t expect retroactive changes like we saw in Spain. This is the worst thing an investor could imagine.

Thomas Schnorrenberg
IR and PR Manager
Capital Stage
Japanese trading houses, also known as sogo shoshas, are large businesses offering a wide range of products and services globally across multiple industries. This broad diversification makes their business model fairly unique to Japan. Driven by both financial and strategic reasons, Japanese trading houses began investing in Europe’s renewable energy sector in 2011.

According to deals tracked by Clean Energy Pipeline, Japanese trading houses were involved in acquisitions of European renewable assets valued at $1.1 billion in 2013, less than the $1.9 billion value of M&A deals in 2012, but more than the $507 million transacted in 2011.

Investing in European renewable energy assets enables trading houses to gain firsthand experience in operating renewable energy assets that can be applied to their domestic markets. Indeed, many have invested heavily in offshore wind generation and transmission assets in order to gain experience that can be applied to developing projects in Japan’s deep waters.

The most active trading houses are Marubeni, Mitsubishi Corp, Mitsui, Sumitomo Corp, Sojitz, and Toyota Tsus. As outlined in the table below, their investment strategies differ significantly, with some focusing on generation assets and others on transmission.

### Notable investments by Japanese trading houses in Europe’s renewable energy sector

<table>
<thead>
<tr>
<th>Investor/Acquirer</th>
<th>Stake</th>
<th>Target/Funding Recipient</th>
<th>Date announced</th>
<th>Enterprise value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marubeni Corp, UK Green Investment Bank</td>
<td>50%</td>
<td>210MW Westermost Rough offshore wind project – operational (UK)</td>
<td>Mar-14</td>
<td>€605 million</td>
</tr>
<tr>
<td>Mitsubishi Corp, Barclays Infrastructure Funds</td>
<td>100%</td>
<td>London Array phase one transmission project – operational (UK)</td>
<td>Sep-13</td>
<td>€553 million</td>
</tr>
<tr>
<td>Mitsubishi Corp</td>
<td>100%</td>
<td>56MW portfolio of operating solar PV capacity (France)</td>
<td>Aug-13</td>
<td>Undisclosed</td>
</tr>
<tr>
<td>Marubeni Corp</td>
<td>25%</td>
<td>Mainstream Renewable Power</td>
<td>Aug-13</td>
<td>€100 million</td>
</tr>
<tr>
<td>Marubeni Corp</td>
<td>50%</td>
<td>National Power (3.3GW of operating gas, coal and renewable energy capacity – Portugal)</td>
<td>Aug-13</td>
<td>Undisclosed</td>
</tr>
<tr>
<td>Sumitomo Corp</td>
<td>39% and 33%</td>
<td>165MW Belwind project (39% – operational) and 216MW Northwind wind farm (33% – construction stage) (Belgium)</td>
<td>Jul-13</td>
<td>€100 million</td>
</tr>
<tr>
<td>Mitsubishi Corp, Innovation Network of Japan (INeJ), Solar Ventures</td>
<td>Joint 85% stake</td>
<td>Solar Holding, owner of a 42MW portfolio of operational solar plants (Italy)</td>
<td>Mar-13</td>
<td>Undisclosed</td>
</tr>
<tr>
<td>Mitsubishi Corp</td>
<td>50%</td>
<td>55MW Tranche 1 of the Toul-Rosières solar project – operational (France)</td>
<td>Jan-13</td>
<td>Undisclosed</td>
</tr>
<tr>
<td>Mitsubishi Corp</td>
<td>50%</td>
<td>129MW Eneco Luchterduinen offshore wind farm – pre-construction (The Netherlands)</td>
<td>Jan-13</td>
<td>Undisclosed</td>
</tr>
</tbody>
</table>

Source: Clean Energy Pipeline
**Investment strategy**

**Return expectations:** 9%-12% p.a. after tax depending on technology, market, and project stage.

**Investment stage:** All asset stages, although investing at the development stage is preferred.

**Holding length:** Long term (10-20 years).

**Level of engagement:** Investments with partners or in joint ventures with strong industrial players; constructing and operating experience is preferred. This can include co-investment with other Japanese trading houses.

**Ticket size:** Varies significantly from small investments of €10-20 million to much larger investments in offshore wind.

**Geographic focus:** All of Europe, with a preference for stable regulatory regimes.

**Use of leverage:** Non-recourse debt is often used in countries where project finance is available. In some cases, debt is provided by Japanese banks.

**Original Equipment Manufacturers**

Wind and solar PV Original Equipment Manufacturers (OEMs) have become increasingly active investors in the European renewable energy market during the past five years. This has primarily been driven by the current overcapacity in the onshore wind and solar PV supply chain, which has forced manufacturers to take a more active role in development and financing in order to ensure sales of their equipment.

In the wind sector, Gamesa, Nordex, Siemens, Vensys and e.n.o are the most active OEMs engaged in project development. Gamesa and Nordex both have specific project development units, with Nordex being one of the most successful developers in France with around 300 MW of installed capacity. Meanwhile Siemens, through its subsidiary Siemens Project Ventures, has invested equity in a number of offshore wind projects, including Butendiek, Lincs and Gwynt y Môr.

Chinese wind OEMs are also active investors in European wind energy projects. In addition to investing equity, they have also been successful in sourcing debt from their Chinese commercial banking and export credit agency relationships. This has been particularly beneficial in enabling Chinese wind turbine manufacturers to expand into challenging markets in Eastern and Southern Europe.

Ming Yang Wind Power Group announced in November 2013 that it will supply turbines and provide EPC services for a 200 MW wind farm in Romania, representing the largest ever export of a Chinese wind turbine manufacturer. A month later, Xinjiang Goldwind Science & Technology secured an EPC contract to build a 50 MW wind farm in Romania as well.

**OEMs typically do not plan to be long-term holders of assets and seek an exit after commissioning, or one to two years into operations. To expedite the capital recycling process, they often start the sales process during the construction phase.**

New solar installations have declined significantly in the past two years, limiting opportunities for solar OEMs to invest in project development. This is a direct result of tariff cuts in Germany and ongoing challenges in Spain, Italy, Greece, and Portugal. Solar OEMs are therefore more focused on building and maintaining distribution channels than on project development. That said, companies such as Martifer Solar still follow a vertically integrated business model.

Although OEMs primarily invest equity in projects to secure sales for their equipment, projects must still be economically sound and meet certain return requirements based on technology and market. OEMs typically do not plan to be long-term holders of assets and seek an exit after commissioning, or one to two years into operations. To expedite the capital recycling process, they often start the sales process during the construction phase.

OEMs investing in offshore wind projects will often be required to hold their stake for a period of years if project debt finance has been utilised, since debt covenants normally prevent an early sale. Investment in offshore wind farms is thus limited to OEMs with large balance sheets.
The capital needs of the renewable energy market lend themselves to the investment rationale of infrastructure funds and private equity funds. Although the majority of active infrastructure and private equity funds are funded by the same types of investors, namely pension and insurance funds, family offices, and high net worth individuals, they have very different investment strategies. Infrastructure funds are predominantly focused on operational renewable assets providing long-term, low risk and stable yields, while private equity funds target earlier stage assets with development and construction risk that offer higher returns. These investment strategies are outlined below.

**Infrastructure funds**

- **Return expectations:** 6%-15% p.a. depending on technology and market.
- **Investment stage:** Assets at late construction or operational stage. Comprehensive risk mitigation is required when investing at the development or early construction stage.
- **Holding length:** Typically hold-to-maturity approach, meaning investments can be held for 20-25 years. Assets are sometimes divested earlier if yield expectations are not met or if the strategic focus of the fund changes.
- **Level of engagement:** Passive investors, typically investing in partnerships with experienced operators, such as utilities.
- **Ticket size:** €10-€30 million, although ticket sizes have increased in recent years as fund sizes increased.
- **Geographic focus:** Mature markets with stable regulatory regimes (Germany, France, Scandinavia, the UK, and Ireland).

“We want well-governed, well-regulated markets,” explained Peter Dixon, Founding Partner and Technical Director at Glennmont Partners. “We don’t want to take sovereign risk, which gives us a bias towards the better governed regulatory regimes of western Europe. We are pretty focused in terms of technology. We will only invest in proven technologies. By proven, we mean that there must already be many fully operational applications in place that have achieved project finance where the OEM is in a position to offer very robust performance guarantees against the technology. This puts things such as innovative thermal technologies for the conversion of biomass and offshore wind off the radar. Our investments are typically leveraged. We made 14 investments from the first fund, and all but three were leveraged.”

**Pension funds and life insurance companies, the typical investors in these funds, are building up their renewable energy investment expertise and are therefore increasingly focusing on direct investments.**

**Investment trends**

With their ability to invest large sums into illiquid assets over the long term with relatively moderate return expectations, infrastructure funds for many years have been the most active investor group in renewable energy assets. However, the business models of infrastructure funds and private equity funds are under pressure. Pension funds and life insurance companies, the typical investors in these funds, are building up their renewable energy investment expertise and are therefore increasingly focusing on direct investments.

A plethora of strict regulatory requirements for funds and fund investors has also created significant obstacles to continued participation in this sector, including the implementation of the Alternative Investment Fund Manager (AIFM) EU guidelines into national laws, as well as Basel III and Solvency II requirements. As
Private equity funds have been first to expand internationally, which has been accelerated by acquiring project developers with large development pipelines. Notable examples include Denham Capital, which has invested in a number of renewable energy project developers with development pipelines across Europe, Africa, the Americas, and Asia. Notable acquisitions include solar developer Fotovatio Ventures, Australian wind farm developer OneWind Australia, and South African renewable developer Biotherm. Another noteworthy example is Axa Private Equity’s acquisitions of French wind farm operator Kalista. Investment funds have also broadened their investor circle to include retail investors through the creation of stock-listed vehicles. See YieldCo section on page 16.

**Private equity funds**

**Return expectations:** 15%-25% (post-tax leverage basis), deriving value from the yield of the asset and the exit.

**Investment stage:** Assets at development and late construction stage.

**Hold length:** Three to seven years.

**Level of engagement:** Hands-on investors, providing financial, engineering, and contract negotiation expertise.

**Ticket size:** Prefer investments in assets 50 MW or larger, as these enable funds to scale their management and financial structuring expertise. Larger projects also match the investment requirements of pension funds and insurance companies, which are the most likely acquirers of these assets.

**Geographic focus:** Broad geographic scope, often investing across the EU, including Eastern and Southern Europe. Also willing to invest in distressed projects and venture into new markets outside Europe.

**Use of leverage:** Leverage is typically used on a non-recourse basis, although leverage may not be used in less mature markets or when it is envisaged that a profitable exit can be achieved in the short term.
Over the past five years, institutional investors such as pension funds and insurance companies have significantly expanded their investment activities in the European renewable energy sector, primarily through direct or co-investments. This is a direct result of the low yield bond environment and highly volatile equity markets. In this context, renewable energy infrastructure assets, which offer long-term predictable and stable cash flows with a low correlation to traditional debt and equity markets, are quite compelling.

**Pension funds typically seek to invest a minimum of €100-250 million per deal. Only large offshore wind farms and secondary transactions involving portfolios of renewable energy assets offer this transaction size.**

Pension funds and insurance companies have similar investment rationales and return expectations, but their investment strategies can differ quite significantly. With their expertise in insuring renewable energy projects, many insurance companies have for many years invested directly in assets. For example, Allianz acquired its first wind farm in 2005 and has since invested €1.75 billion project equity into 43 wind projects and seven solar projects totalling over 1 GW.

On the flipside, pension funds have favoured investments through intermediaries such as funds and pooled investments. However, in recent years, pension funds in Denmark, the Netherlands, Sweden, and the UK have shifted to investing directly. One of the first examples of direct investment was Ampere Equity Fund and Dutch Pension Fund PGGM’s acquisition of a substantial minority stake in the Walney offshore wind farm from DONG Energy in 2010.

Pension funds and insurance companies can invest equity and debt in projects, although the majority prefer equity as it generates higher returns. However, some institutional investors have also provided debt as it enables more funds to be deployed in the sector and adds capital diversification. Institutional investors prefer investments in mature renewable technologies including hydro, onshore wind and solar PV, but began investing in offshore wind in recent years due to the higher return profile and ability to invest large sums at once.

While institutional investors have aggressively ramped up their renewable energy investment activities during the past five years, they face a number of obstacles that have prevented them from investing more. These include:

- **Ticket size:** Pension funds typically seek to invest a minimum of €100-250 million per deal. Only large offshore wind farms and secondary transactions involving portfolios of renewable energy assets offer this transaction size. The majority of renewable energy assets are significantly smaller, thus limiting opportunities for institutional investors.

- **High acquisition costs:** The lack of standardisation in the acquisition process in relation to identification, valuation and due diligence, leads to relatively high acquisition costs. Investors seeking to invest directly must therefore build up internal teams to undertake these processes. However, the cost of these teams can be high relative to the investment opportunity.
• **Regulatory requirements:** Institutional investors are faced with many regulations such as Solvency II that penalise alternative and illiquid assets through higher equity requirements. Other regulations that act as a hurdle are European unbundling rules for power generators and distributors, limiting investors to one of the two roles.

• **Uncertain subsidy frameworks:** Institutional investors are concerned about the underlying political risk associated with renewable energy projects, especially in the context of retroactive cuts made to renewable energy subsidies in Spain and some Eastern European countries. These concerns are paramount to institutional investors given their long-term, low-risk investment strategy.

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### Landmark European renewable energy investments by pension funds and insurance companies

<table>
<thead>
<tr>
<th>Investor(s)</th>
<th>Stake acquired</th>
<th>Target</th>
<th>Deal size</th>
<th>Date announced</th>
</tr>
</thead>
<tbody>
<tr>
<td>PensionDanmark, through infrastructure fund manager Copenhagen Infrastructure Partners</td>
<td>67%</td>
<td>900 MW DolWin3 offshore wind grid connection</td>
<td>€384 million</td>
<td>Feb-14</td>
</tr>
<tr>
<td>Gothaer Versicherung</td>
<td>Undisclosed</td>
<td>Juwi Renewable IPP, owner of a 450 MW portfolio of solar PV and onshore wind capacity</td>
<td>€150 million</td>
<td>Jan-14</td>
</tr>
<tr>
<td>Predica (subsidiary of Crédit Agricole Assurances)</td>
<td>50%</td>
<td>Futures Energies Investissement Holding (subsidiary of GDF Suez), which operates 440 MW of installed onshore wind capacity</td>
<td>Undisclosed, although will enable GDF SUEZ to reduce its net debt by some €400 million</td>
<td>Dec-13</td>
</tr>
<tr>
<td>Allianz Capital Partners (alternative asset investment platform for Allianz)</td>
<td>100%</td>
<td>100 MW portfolio of three onshore wind farms, including a 76.5 MW project in Germany and two projects in France totalling 23.5 MW</td>
<td>Undisclosed</td>
<td>Jun-13</td>
</tr>
<tr>
<td>MEAG (asset management arm of Munich Re), General Electric, EDF Energies Nouvelles</td>
<td>100%</td>
<td>Iberdrola Renovables France (operating 32 onshore wind farms in France totalling 321 MW)</td>
<td>€400 million</td>
<td>Dec-12</td>
</tr>
<tr>
<td>Aviva Investors (asset management arm of Aviva)</td>
<td>100%</td>
<td>23 MW portfolio of over 7,000 UK residential solar PV assets</td>
<td>€126 million</td>
<td>Aug-12</td>
</tr>
<tr>
<td>Irish Infrastructure Fund, asset management arm of Irish Life &amp; Permanent PLC</td>
<td>75%</td>
<td>104 MW portfolio of ten onshore wind farms in the Republic of Ireland and Northern Ireland</td>
<td>€200 million</td>
<td>Jun-12</td>
</tr>
<tr>
<td>PensionDanmark A/S, PKA A/S</td>
<td>50%</td>
<td>400 MW Anholt offshore wind farm</td>
<td>€900 million</td>
<td>Mar-11</td>
</tr>
</tbody>
</table>

Source: Clean Energy Pipeline
Quoted investment vehicles

Quoted funds are not a novelty in private equity or venture capital, but are relatively new to the renewable energy sector. Broadly speaking, quoted investment vehicles fall into two camps – YieldCos and closed-end funds.

Since the beginning of 2013 six YieldCos dedicated to renewable energy investments have raised £1.3 billion through IPOs and secondary offerings on the London Stock Exchange. No similar vehicles exclusively targeting the renewable energy sector raised capital in the previous year.

I don’t think there is sufficient investment capacity for a lot more YieldCos. These funds took almost £1 billion out of the market last year.

YieldCos are attractive to investors as they offer an inflation-linked yield that, in the current low-interest environment, is more attractive than mainstream fixed income instruments such as bonds. Most YieldCos offer initial yields of 6% that increase in line with inflation.

The investment strategies of the six largest YieldCos currently operating in Europe – Greencoat UK Wind, TRIG, Foresight Solar Fund, Bluefield Solar Income Fund, John Laing Environmental Assets Group and NextEnergy Solar Fund - are outlined in the table below:

What are YieldCos and Closed-end funds?

YieldCos are formed when an asset owner bundles a portfolio of generating assets in a separate holding, which is then floated on an exchange. If these assets have little or no leverage, the holding company can offer a very attractive dividend yield, similar to an annuity.

Closed-end funds raise public money in a fund structure. Strategies can include acquiring development or construction stage assets, in order to achieve a specified return over three or more years of operation. Profits are then recycled into new assets. Alternatively, closed-end funds acquire operational assets under a buy-and-hold strategy to achieve a particular yield from year to year.

What investment strategies do listed vehicles pursue?

• Strong focus on yield, leading to little or no leverage
• Careful adherence to the investment mandate / prospectus
• Investors require lower returns than other investors, leading to higher prices paid to acquire assets
• Investments have low risk tolerance

UK YieldCos

<table>
<thead>
<tr>
<th>Description</th>
<th>Asset portfolio</th>
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Greencoat UK Wind raised £260 million through an IPO on the London Stock Exchange in March 2013, and a further £85 million through secondary offerings in December 2013 and January 2014. Greencoat UK Wind mainly invests in operating onshore and offshore wind farms in the UK with a capacity of over 10 MW. No more than 40% of its portfolio will comprise offshore wind, and no wind farm will be acquired if the acquisition price is over 25% of the total portfolio value. The company seeks to acquire 100%, majority or minority interests in wind farms.

Target dividend per share: 6%
### The Renewables Infrastructure Group (TRIG)

<table>
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<th>Description</th>
<th>Asset portfolio</th>
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</table>
| TRIG invests in operational renewable energy projects in the UK and Northern European countries. In July 2013, the company raised £380 million through an IPO on the London Stock Exchange. The fund primarily invests in onshore wind and solar PV projects, and limits investment in other forms of energy technology, such as biomass and offshore wind, to 10% of portfolio value. No more than 50% of the fund will be invested in projects outside the UK, and no single asset will account for more than 20% of the portfolio. TRIG will typically acquire majority stakes. | UK: 195.5 MW onshore wind farm portfolio  
UK: 57.5 MW solar PV portfolio  
Republic of Ireland: 9.9 MW onshore wind portfolio  
(Milane Hill - 5.9 MW, Beenogaheen - 4 MW)  
France: 73.2 MW onshore wind farm portfolio  
(Haut Languedoc - 29.9 MW, Haut Cabardes - 20.8 MW, Cuxac Cabardes - 12 MW, Roussans-Cabanes - 10.3 MW)  
France: Puits Castan solar PV project - 5 MW |

**Total funds raised:** £376 million

**Target dividend per share:** 6%

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### Foresight Solar Fund

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<th>Description</th>
<th>Asset portfolio</th>
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| Foresight Solar Fund raised £150 million through an IPO in October 2013. The company typically invests in operational solar power plants in the UK. The company will limit investments in non-UK projects and construction-stage assets to a maximum of 25% of the fund’s gross asset value. The fund will acquire both majority and minority stakes in projects. No single investment will comprise more than 30% of the portfolio value. | UK: 174.1 MW solar PV portfolio  
(Wymeswold - 32.2 MW, Castle Eaton - 17.8 MW, Highfields - 12.2 MW, Hunters Raze - 10.7 MW, High Penn - 9.6 MW, Spring Farm - 12 MW, Pitworthy - 16 MW, Kencot - 37 MW, Bournemouth - 37.3 MW) |

**Total funds raised:** £150 million

**Target dividend per share:** 6%

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### Bluefield Solar Income Fund

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<tr>
<th>Description</th>
<th>Asset portfolio</th>
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| Bluefield Solar Income Fund raised £130 million through an IPO in July 2013. It invests in solar PV projects in the UK. The company primarily acquires majority stakes, but will also make minority investments. The company may leverage short-term debt finance to facilitate acquisitions, but short-term debt will not exceed 50% of the gross asset value. No single investment will represent more than 25% of the fund’s net asset value. | UK: 128.5 MW solar PV portfolio  
(Swindon - 32.2 MW, Hill Farm - 24.6 MW, Hardingham - 18.4 MW, Kent - 11 MW, Gosseswell - 10.8 MW, North Beer - 8.87 MW, Hampshire, Norfolk, Glamorgan – 33 MW, Hertfordshire - 17.5 MW) |

**Total funds raised:** £143 million

**Target dividend per share:** 7%

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### John Laing Environmental Assets Group

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<tr>
<th>Description</th>
<th>Asset portfolio</th>
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| John Laing Environmental Assets Group (JLEN) raised £160 million through an IPO on the London Stock Exchange in March 2014. Upon completion of the IPO, it completed the acquisition of seven environmental infrastructure assets, six from the John Laing Group. John Laing Investments Ltd holds 39.7% of the voting rights attached to the share capital of the company. Unlike other YieldCos, JLEN will invest in waste and waste water PFI assets alongside renewable energy. | UK: 44.4 MW onshore wind farm portfolio  
(Hall Farm - 24.6 MW, Bilshorpe - 10.2 MW, Castle Pill and Fernsdale - 9.6 MW)  
UK: 24.5 MW solar PV portfolio  
UK: Waste Treatment Portfolio  
(D&W Waste, ELWA Waste) |

**Total funds raised:** £160 million

**Target dividend per share:** 6%

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### NextEnergy Solar Fund

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<th>Description</th>
<th>Asset portfolio</th>
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| NextEnergy Solar Fund raised £85.6 million through an IPO on the London Stock Exchange in April 2014. It will primarily target UK solar PV assets. According to Director Michael Bonte-Friedheim, the first £85.6 million will be used to acquire eight UK solar projects. | UK: 21.8 MW solar PV portfolio  
(Higher Hatherleigh - 6.1 MW, Shacks Barn – 6.3 MW, Gover Farm – 9.4 MW) |

**Total funds raised:** £85.6 million

**Target dividend per share:** 6.25% (5.25% for the year ending 31/03/2015)

Source: Clean Energy Pipeline
The majority of YieldCos pursue similar investment strategies in funding acquisitions through the bank debt markets before refinancing in the public equity markets. However, as shown in the table above, there are some minor differences. For example TRIG is the only YieldCo to have Euro exposure. In addition, Bluefield offers a higher yield of 7%, but does not reinvest to grow the net asset value of its portfolio.

Recent YieldCo fundraisings indicate that investor appetite for these structures may be diminishing. For example, the £85.6 million raised by NextEnergy SolarFund in April 2014 was the minimum of its range for the offering, which had targeted up to £150 million when it was announced in January. In addition, the £150 million raised by Foresight Solar Fund through its IPO in October 2013 was £50 million less than the £200 million initially targeted.

“I don’t think there is sufficient investment capacity for a lot more YieldCos,” explained Stephen Lilley, Partner at Greencoat Capital. “YieldCos took almost £1 billion out of the market last year, and Foresight Group really struggled to get listed. There is just not that equity in the UK. Someone will fail. There are four or five funds in the PFI sector, and these took four years to get established; in this case four YieldCos listed in eight months.”
Renewable energy is underpinned by the German Renewable Energy Act, which provides 20-year fixed feed-in-tariffs and grid priority. The cost of this support program is borne by the end consumer, with a mandatory premium added on each kWh used, the so-called EEG-levy. In parallel, cheap and reliable debt financing has been readily available through the politically supported KfW 270 and 274 programs.

Solar PV, onshore wind and offshore wind have been major contributors to Germany’s new energy mix, each of which has developed in a unique way:

**Market Status**

On the face of it, Germany should not be Europe’s largest renewable energy market given its inferior renewable energy resources. It has neither the solar irradiation of Southern Europe nor the wind yields of Scandinavia and Eastern Europe, which benefit from wind speeds often in excess of 6.5m/s.

However, a series of market incentives crafted to stimulate an energy turnaround (Energiewende), has resulted in Germany accelerating ahead of its neighboring countries to become Europe’s largest renewable energy market. At of end 2013, 34.3 GW and 35.7 GW of wind and solar PV capacity respectively had been installed in Germany. This contributed to renewable energy accounting for 23% of total electricity generation in 2013.

**Solar PV**

Generous feed-in tariffs and preferential tax treatment have enabled equity returns on solar PV assets of 9-15%, which has attracted the attentions of many homeowners and private equity funds. A series of EEG revisions over time have steadily reduced the feed-in tariff rate, but this has been countered by rapidly declining panel prices and EPC margins. This has resulted in installation costs falling from over €4,000/KWp in 2006 to €900/KWp today.
However in recent years solar PV has been subjected to criticism from homeowners and industry as it now accounts for a significant proportion of the EEG levy.

**Onshore wind**

A combination of significant federal and regional support has resulted in Germany becoming the world’s third largest onshore wind market by installed capacity, behind only China (91 GW installed at the end of 2013), and the USA (61 GW). Between 2006 and 2010, construction of wind farms was financed by large utilities and financial investors, with projects of over 50 MW being the norm. However, today large utilities and infrastructure funds are focused on divesting onshore wind farm portfolios in order to bolster their balance sheets and to recycle capital into new investments (for more information on utilities’ renewable energy investment strategy see page 4 of this report). Instead, financing for new wind farms is now often provided by German and Swiss municipal utilities.

**Offshore wind**

Some 580 MW of offshore wind capacity is currently operating in the German Baltic and Northern Sea. A further 31 projects are permitted and are at different stages of development. Due to the large volumes of capital required, the market is dominated by utilities and IPPs. These actors frequently bring in financial co-investors to share the equity burden, with the utility fulfilling the role of operating the asset. International infrastructure funds and pension funds have been the most active equity co-investors thus far, not least as it enables them to invest large sums of €50-€150 million.

**Opportunities & Challenges**

With a range of experienced EPCs, standardized permitting processes and secure financing options, Germany is one of the most mature renewable energy markets globally. These attractive conditions have resulted in an influx of investment from the likes of international pension funds and Swiss utilities, which has put downward pressure on yields. In fact, German renewable energy assets are now probably the lowest yielding renewable energy assets globally.

Since 2012, the sector has also been subjected to increasing political challenges due to rising consumer electricity prices. The industry has also received pushback due to visual pollution of wind turbines. This has created complexity in the permitting process and added legal risks for developers and investors. To counter this, developers have attempted to foster local support through initiatives such as raising equity capital through citizen participation models. However, such financial models can often deter institutional investors.

Off-take prices for operating renewable energy projects are currently fixed through the EEG. However, in September 2013 the newly formed CDU and SPD coalition government commenced a process to reform the EEG, in which it will likely introduce an element of market and pricing risk. This is a direct result of the massive growth in wind and solar capacity in the past five years, which has resulted in negative pricing during times of high wind speeds and solar irradiation.

“Investing in onshore wind under the new EEG will be more complicated as a tender process will be introduced from 2017,” explained Kay Dahlke, Managing Director at Thuega. “This may create opportunities for companies like us that have a utility background. It may also dissuade some of the financial investors. So in the mid-term we think we will be able to get some good projects.”

**Debt Financing**

The low interest rate environment and sufficient banking liquidity combined with the ongoing 270 and 174 programs of State-owned KfW mean that bringing debt financing into German renewable energy projects is not an issue of concern. Non-recourse debt project finance of 16-17 year tenors with up to 70% leverage is readily available, typically with risk margins in the range of 100-150 bps over refinancing costs.

**Equity Sponsors**

Germany’s market is one of the most mature in Europe and as such is attractive to all investor groups discussed in this report. Unlike other markets, the only reason why Germany may not be attractive to certain investor groups with high return requirements is the low yields on offer. Solar PV equity yields are currently in the 4.8%-6.0% per annum range (20 years, P50 irradiation), while returns of 7.5%-8.5% per annum are available for offshore wind (25 years, P50 wind resource). Offshore wind equity returns are currently in the 7%-11% range, depending on the development phase.

“There has been a massive decrease in absolute returns for German onshore wind assets since 2011, maybe in the order of 1%-2%,” confirmed Felix Meier, CEO of Swisspower. “This is due to the strong level of competition for assets amongst institutional investors such as insurances companies and pension funds. These kinds of investors are on the market and they seem to accept lower returns, which spoils the market for us.”

“In the German onshore wind market, IRRs are between 6.0% and 7.0% and between 3.7% and 4.2% on an unleveraged basis,” explained Kay Dahlke, Managing Director at Thuega. “For us this return is too low. There is uncertainty regarding the EEG, meaning financial investors are looking for investments now. They can pay higher prices than us. You see lots of transactions in the German wind market at the moment but 80% of these involve financial investors.”

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**Equity IRR vs Market Maturity**

![Equity IRR vs Market Maturity](image)
UK

With 10.5 GW of onshore wind and 3.7 GW of offshore wind installed at the beginning of 2014, the UK is one of Europe’s largest wind energy markets. Annual onshore wind installations are expected to total 2 GW, and offshore installations 1-1.5 GW, each year, and continuing through 2020. On the other hand, the UK’s solar industry is less developed since a feed-in tariff for solar PV was only introduced in 2011, long after many other European countries. Only 3.1 GW of solar PV capacity was operational at the beginning of 2014, representing merely 15% of the government’s target of 20 GW installed capacity by 2020.

Market Status

In contrast to most continental European markets, the UK has opted for a two-pronged subsidy mechanism: A feed-in tariff for small-scale solar PV projects and the Renewables Obligation Certificate (ROC) scheme. Under the ROC scheme, electricity producers approach the merchant market for selling electricity and certificates, or hedge price risk by PPAs for larger solar PV, wind, and biomass projects.

The subsidy mechanism is expected to change starting July 2014, when projects will be subsidised by a contract for difference FiT. A tender mechanism will also be introduced, where projects will have to compete for subsidies through a reverse auction process for contracts. The new subsidy scheme is being introduced as part of the government’s Electricity Market Reform (EMR) process. Between 2014 and 2017, developers will have the choice of accessing the new CFD or using the existing ROC subsidy.

Debt Financing

With a mature domestic banking sector and stable regulatory framework attracting foreign lenders, there should, in theory, be no shortage of liquidity for renewable energy projects. However, a strict banking regulatory framework, coupled with PPA tenors often shorter than PPA periods, mean that conventional banks are typically only able to offer mini-perm structures. Since these create refinancing risk, borrowers, particularly in the solar PV sector, have resorted to two UK-specific debt structures, mini-bonds and project bonds.

Mini-bonds are unlisted instruments targeting the retail sector with little transparency or standardisation. With nominal yields of 6%-7.25% p.a. in 2013, they offer a superior return against UK saving account rates of 0%-2% p.a. to investors, but are typically not linked to any specific collateral. To increase their appeal to the retail market, issuers have offered additional perks. Good Energy’s mini-bond offers a 0.25% p.a. coupon increase for investors that are also customers.

Project bonds that are collateralised through an underlying cash-flow have also been utilised to target institutional investors. With a floating, inflation-linked coupon, project bonds closely resemble traditional bank debt. Three solar PV project bonds have been issued thus far. Details are outlined in the table opposite.
Equity Sponsors

For many years, the UK renewable energy equity investment landscape was broadly similar to continental Europe. However, the emergence of YieldCo vehicles since 2012 has created a new equity investor group that is not active in the rest of Europe (Please see YieldCo investor section for more details).

YieldCos accounted for 23% of the total value of acquisitions of UK renewable energy assets since the beginning of 2013.

Offering various tax benefits and a direct route to retail money, the small investment schemes, particularly the Enterprise Investment Scheme (EIS), raise capital through public markets, with expected yields to the investor of 6%-8% p.a. Five EIS have collected a disclosed £170 million in 2013-2014 alone and existing ones have offered new shares. The necessity to invest the capital raised, as well as low return expectations due to embedded tax benefits, render these funds currently the most active investors in the UK market, with premiums paid on assets of 10% over the rest of the market. The first EIS funds are already looking at assets in foreign markets such as France and Scandinavia.

Publicly listed YieldCos such as Greencoat UK Wind, TRIG, and Foresight Solar Fund have also been active acquirers of operating renewable energy assets. According to data tracked by Clean Energy Pipeline, YieldCos accounted for 23% of the total value and 28% of the total number of acquisitions of UK renewable energy assets since the beginning of 2013.

The offshore market is in contrast still dominated by DONG and the UK’s Big Six utilities. Of those, only DONG is still committed to offshore development, with domestic utilities pulling out of new development due to frustrations regarding the market’s uncertainties. It remains to be seen whether the offshore build-out target of 8-15 GW by 2020 can be achieved on this basis.

London-based private equity funds have also been very active in funding the construction of large-scale renewable energy portfolios across Europe (see infrastructure and private equity fund section for more information).
Sweden

Sweden introduced a support scheme for renewable energy in 2003, making it the first Scandinavian country to do so. Driven by innovation in turbine structures, such as higher hub heights and larger rotor diameters, wind projects have become significantly more economically viable to the extent that 4,470 MW of onshore wind capacity was installed at the end of 2013, making it Europe’s eighth largest, and Scandinavia’s largest, onshore wind market.

However, decreasing electricity and certificate prices resulted in a 15% decrease in installed wind capacity to 724 MW in 2013. Nonetheless, the volume of wind capacity installed in 2013 was the fourth largest in Europe, behind Germany, the UK and Poland, demonstrating that investors have long term faith in Sweden’s wind market. This optimism is partly driven by the expectation that electricity prices in Scandinavia will increase to price levels of continental Europe over the next decade.

Norway

Norway adopted a green certificate mechanism in 2012, at which point 537 MW of onshore wind was installed. That same year, 166 MW was newly installed, indicating it is unlikely Norway will achieve its 2020 EU Directive. Norway and Sweden have a joint goal to produce 26.4 TWh of renewable electricity by 2020, with each country producing 13.2 TWh.

Most projects in Norway have been developed by Statkraft or municipal utilities. Municipal utilities own significant project pipelines, but do not have the necessary capital for deployment. They are also not accustomed to partnering with co-investors that are not other utilities and are less flexible when it comes to financing structures. In addition, most projects are relatively large (>75MW), which thus excludes small and mid-sized investors.

Finland

Finland introduced a market premium renewable energy support scheme in 2011, which provides price and market certainty in a similar way to a feed-in tariff. The subsidy mechanism is capped at 2,500 MW, although the government is currently discussing increasing this. Only 2 MW of wind capacity had been installed when the subsidy was introduced. Some 550 MW is expected to be operational by the end of 2014. Most projects are under 30 MW in size due to permitting requirements for larger projects.

Most projects in Norway have been developed by Statkraft or municipal utilities. Municipal utilities own significant project pipelines, but do not have the necessary capital for deployment.
Challenges

Norway and Sweden have a joint electricity market and subsidy mechanism and are therefore competing directly for investors. However, Norwegian projects are at a disadvantage due to higher corporate taxation and capex, less favourable depreciation, and more complex grid connection compared with Sweden. This means that only Norwegian projects with a very good wind resource and ultra-low capex can compete with projects in Sweden.

Depressed electricity and certificate prices also make new wind energy investment challenging, although this impacts project economics in both countries. In February 2014, an expert panel (Kontrollstation) that monitors and reviews the market every three years, released a report stating that low certificate prices are a direct result of a temporary oversupply. To remedy this situation, the panel recommended increasing the quota obligation. This resulted in a 15% increase in certificate prices overnight.

Financial investors, such as pension funds and infrastructure funds, have little appetite to invest in renewables in Sweden and Norway due to the limited opportunities to secure long-term offtake agreements for the produced electricity and certificates. The Nord Pool exchange only offers 3-5 year forwards, but financial investors seek long-term predictable cash flows for 10-15 years. A market for bilateral PPAs is being established, with Google a prominent player, but this market is still in the very early stages of development.

The Finnish market has a different set of advantages and disadvantages compared to Sweden and Norway. On the positive side, projects in Finland benefit from a 12-year market premium model that eliminates price and offtake risk. However, the project development phase is long and arduous, with grid access, regional planning, and radar installation taking more time than in other European countries.

Debt Financing

The majority of wind projects in Scandinavia have been financed on balance sheet as the majority of sponsors have been strategic investors such as utilities or energy intensive corporates. However, with more financial investors entering the market, the appetite for project debt finance has increased.

Most Nordic and German banks are active lenders to wind projects in Scandinavia. In Norway and Sweden, gearing is typically 60-65%, which is slightly lower than in Finland and the rest of Europe. Debt tenors are 5-9 years in Norway and Sweden, which is shorter than in Finland, where 8-10 year tenors are the norm.
Local utilities have thus far dominated the Scandinavian renewable energy market. In addition, a handful of foreign utilities such as E.ON, Alpiq, Stadtwerke Munich, and ewz have also been active. A few financial investors with higher risk-return appetite have entered the market since 2010. For example HG Capital invested in the Venus Vind portfolio in early 2010, while Platina Partners acquired 50% of the 200 MW Jdraas wind project in Sweden in late 2011.

Recently, more risk adverse investors have entered the market, including Allianz, Goodyield Capital, and WHEB. These investors seek de-risked projects, ideally with a long-term PPA and an EPC-wrap. Project returns of 8% after tax are currently available in Scandinavia.

Notable renewable energy investments in Scandinavia by foreign investors are outlined below.

- In December 2013, Renewable Energy Infrastructure Fund, a fund managed by GCG Renewable Energy Management (which belongs to Goodyields Capital), acquired the 16 MW Mässingberget wind farm, located in Dalarna, Sweden. The project was developed by O2.
- In September 2013, Impax Asset Management announced the acquisition of the Kuolavaara-Keulakopää and Joukhaiselkä pre-construction stage wind power projects totaling 78 MW in Lapland, Finland, from Fortum and Metsähallitus.
- In June 2013, Allianz Capital Partners signed an agreement to acquire the 72 MW Maevaara wind farm in Northern Sweden from developer O2. Allianz will provide a loan facility to fund construction during 2013 and 2014, and acquire the project upon its completion. For ten years, the electricity produced will be sold to Google under a ten-year PPA. Google will use the electricity to power its datacenter in Finland.
- In April 2013, German municipal utility Stadtwerke München announced the acquisition of the construction-ready 144 MW Sidensjö wind farm in Västernorrland County, Sweden. The project is expected to be fully operational in spring of 2015.
Global Capital Finance is an international investment banking and financial services firm, providing innovative advice to public and private sector clients worldwide, with a strategic focus on the renewable energy sector. We advise developers who are seeking equity and debt, sellers during the divestiture process, and investors during the acquisition process. Global Capital Finance also provides general advice to firms seeking investment opportunities in this sector. For investors who need continued support, we provide asset management services regarding their investments. Global Capital Finance is also active in other industries, such as energy, transportation, public finance, infrastructure, and real estate.

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