Renewable energy assets
An interesting investment proposition for European insurers
Contents

03 An introduction to the illiquid asset opportunity and renewable energy assets
05 Background: European renewable energy asset market
07 The potential investment opportunity for European insurers
09 Investment considerations for European insurers
11 Concluding thoughts
Renewable energy assets provide a new and alternative opportunity for investment at a time when European insurers are looking to optimize their balance sheets. As insurers search for yield, these illiquid assets offer a wide range of risk-return characteristics and benefits to help reduce capital requirements for Solvency II, as well as the potential to generate additional income.

In exploring this asset class, we look at current market and historic performance, and some meaningful global investments that insurers are making in renewable energy. We discuss capital considerations for credit risk and modeling, investment risks that are unique to this market and ways that new technology may change the landscape for new entrants.

The illiquid asset opportunity

Current market conditions have helped drive institutional investors toward new and alternative opportunities that offer higher risk-adjusted yields. The current environment has also made organic growth more difficult for insurers. As a result, many are considering other ways of adding value. One approach is to sell high-quality liquid assets and invest in illiquid assets, which has led to an increasing interest in less liquid and alternative assets over the past year.

Increased exposure to higher-yielding illiquid assets is not the only consideration for insurers looking to optimize their balance sheets. Most insurers are faced with the challenge of balancing an appetite for greater returns against compliance with new regulations. Therefore, both economic and regulatory factors must be considered to determine whether new investment opportunities are attractive.

Among non-traditional asset classes, insurers have started investing in renewable energy generation assets. As noted on page 4, Allianz, Munich Re and Aviva have directly invested a total of €2.4b, while PIC made a £40m solar bond investment in 2012 – hot on the heels of a £50m social housing bond issue.¹

There are a number of things for insurers to consider when investing in renewable energy assets – for example, how to calibrate and mitigate the different types of risks that these assets pose compared with traditional assets. These considerations are in the face of a changing regulatory environment.

The considerations for an insurer making an investment in renewable energy are covered later in this paper.

An introduction to the illiquid asset opportunity and renewable energy assets

There is huge political will within the European Union (EU), and beyond, to meet renewable energy targets. The EU’s “20-20-20” target is so-called because it aims to obtain 20% of its energy from renewable sources by 2020. The United Nations also has a longer-term objective to double both the rate of global energy efficiency and the current contribution of renewable energy to the global energy mix.

¹ Currently, €1.00 = US$1.36; £1.00 = US$1.66.
In an attempt to meet these targets, governments of many EU countries have been providing support for firms generating renewable energy, normally in the form of revenue-based subsidies. Any explicit government backing should serve to reduce the credit risk associated with the investment. As in other types of infrastructure investment, it is possible to invest in renewable energy in three ways:

1. Directly
   - Allianz has invested €1.3b since 2005, most notably in purchases of German and French wind farms.
   - By mid-2013, Munich Re's latest purchases of wind farms and solar plants allowed it to reach €1b of its €2.5b renewable energy investment target.
   - Also in 2012, Aviva purchased a portfolio of feed-in-tariff solar assets for £100m.

2. Indirectly
   - Pension Insurance Corporation purchased the first-ever UK publicly listed solar finance bond in November 2012. It invested £40m as the sole buyer in a Solar Power Generation Ltd. (SPGL) bond, which matures in 2036.

3. Publicly traded assets
   - Investment is being made in publicly held companies which are generating energy from renewable technology – for example, Greencoat UK Wind, Bluefield Solar, Aleo Solar and Iberdrola Renewables.

Relative to other markets (e.g., the US and China), the European market for renewable energy bond finance is less mature and continues to be dominated by direct investment. Insurers tend to invest in perceived high-grade assets, seeking a consistent yield and long-term predictable cash flows. This will be particularly important when constructing asset portfolios backing long-term liabilities, such as books of annuities. Insurers are likely to invest after the development and construction phases, because they are likely to have a limited appetite for construction risk.
The current market and historic performance

Although we have been harnessing renewable energy for the past 4,000 years in the form of wind used to propel boats, figure 1 shows that we have only recently started to see a meaningful increase in global investment in renewable energy.

In 2012, global investment in new renewable power and fuels totalled US$244b, three quarters of which was contributed by Europe, China and the US. Although the gap between renewable energy and fossil fuel investment is closing, this figure is down 12% from 2011’s record of US$279b. There were two main reasons for this decline:

1. Uncertain political support in developed markets

As a result of the increasing popularity and falling cost of renewable energy, policy makers have been undergoing a learning process when it comes to setting tariffs. Initially, policy makers in developed markets designed overgenerous and inflexible subsidy schemes. These schemes were unable to respond to the falling costs of installing renewable energy technology, causing installation booms in some European countries.

In the US and Europe, there was uncertainty as to whether policy makers would extend the lifespan of subsidies beyond their current expiration dates. This uncertainty was potentially fuelled by retroactive cuts in some EU countries. For example, in Spain, there were cuts in tariff support for photovoltaic (PV) solar projects and a tax introduced on the revenues of renewable power plants. On a positive note, further clarification on support policies was provided by governments in the US (production tax credit for energy created from wind) and UK (renewable obligation certificates) late in 2012. In September 2013, the outcome of the German election was positive for the future of renewable energy in one of Europe’s most influential nations.

2. The falling cost of renewable energy investment

As technology advances are made, the cost of generating renewable energy continues to fall. For example, in the last five years, we have observed an 80% reduction in the price of PV technology.

Figure 1. Global investment in renewable energy from 2004–2012

*Asset finance volume adjusts for re-invested equity. Total values include estimates for undisclosed deals.
1. Source: UNEP, Bloomberg New Energy Finance
A fall in the monetary amount of renewable energy investment may cause one to assume that less renewable energy is being produced. Certainly in terms of both wind and solar power, the number of megawatts installed in 2012 was greater than in 2011. Therefore, we need to consider the falling cost of generating renewable energy in tandem with the amounts invested. We should note at this stage that some of this disparity may be due to timing: some projects financed in 2011 did not start producing energy until 2012.

Renewable energy indices

The WilderHill New Energy Global Innovation Index (NEX) is made up of approximately 100 companies whose main goal is the production, use and increased efficiency of renewable energy. As noted in figure 2, the NEX bottomed out in July 2012, due in part to global political uncertainty in relation to subsidies. Since clarity has increased, the NEX has climbed 70%.

Investors seeking a more diversified portfolio will observe that there is relatively no correlation between the NEX and the S&P 500 index. More specifically, insurers might find that this lack of correlation offers a larger degree of diversification than traditional equity investment. As such, this can have positive capital consequences that we will discuss.

Figure 2. S&P 500 (gray) vs. NEX (yellow), indexed to 100 as of 29 December 2000

NEX hit its indexed peak of 278.5 on 8 November 2007

NEX's decline meets the S&P 500's slow-and-steady rise on 20 September 2011 when the S&P's indexed value surpasses NEX's and never looks back.

Indexed values as of 18 December 2013

Source: ThomsonONE; EYK analysis
Why would European insurers invest in renewables?

Difficult market conditions, a low-yield environment, increasing requirements for banks to hold high-quality liquid assets, and insurers’ increased appetite for capital optimization of asset portfolios have created the perfect storm for increased investment in illiquid assets.

Two recent surveys have cited the low-yield environment as the key driver of change affecting the insurance industry. This issue is exacerbated as higher-yielding bonds mature and are replaced with lower-yielding issues.

As a result, insurers are exploring opportunities to generate additional income, reduce capital and/or increase IFRS earnings. Illiquid assets are becoming more appealing investments, providing insurers with what are perceived as predictable and stable cash flows over the long term.

Long-term government support

In an environment where the EU has made significant commitments to achieving renewable energy targets, the renewable energy industry is receiving explicit financial support from national governments. For example, in the UK, contracts for difference (CFD) are being introduced. These are long-term contracts designed to provide stable and predictable incentives for companies to invest in low-carbon generation.

As the sponsor is a stable government or government-backed agency, the credit risk may compare favorably with traditional corporate bonds.

Liquidity premium

The long-term revenue stream can offer a cash flow profile similar to that of certain insurance products, e.g., annuities in the UK and Spain. As annuities cannot be commuted, these assets may be used to build a matched asset portfolio that can be held to maturity. Other institutional investors with long-term liabilities (e.g., participating business, general insurers with long-tailed liabilities and pension funds) will similarly require a long-term investment horizon. Insurers have traditionally tended to be holders of liquid assets (gilts, cash and highly rated corporate bonds). However, the illiquid nature of their liabilities means that they can invest in less liquid assets. The highly collateralized nature of certain illiquid assets, compared with the liquid equivalent, may imply lower credit risk and, therefore, a potentially favorable capital treatment.

For example, comparing the estimated credit spread stress of an A-rated corporate bond with that of an offshore energy arrangement asset demonstrated that although their total spread stress was similar, the credit stress for the offshore energy arrangement was around 180 basis points lower than for the corporate bond. This figure was over 200 basis points lower when compared with a BBB-corporate bond.

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Based on recent data, there are two key reasons for this:

- **Probability of default:** In the operational phase of an infrastructure project, the probability of default is significantly lower than those observed for a BBB corporate asset.

- **Loss given default:** The loss on corporate assets following a default event of approximately 65% is between three and six times higher than losses observed using data for infrastructure loans.

**Diversification benefits**

Figure 2 compared the performance of the NEX index with the S&P 500 and suggests that there is not a strong correlation between renewable energy assets and traditional equity returns. In a Solvency II context, this could increase the diversification benefit within the market risk module, further improving the capital position.

However, to date, European insurer investment in renewable energy has been relatively limited, particularly in regard to renewable energy bond issuance. We expect this to increase as insurers continue their search for yield.
Renewable energy assets

Capital considerations

Credit risk and modeling: For insurers, isolating the individual spread components is one of the most complex elements of investing in illiquid assets. As renewable energy investment is a relatively new area, default data is sparse. As such, it can be difficult to calibrate.

One method of calculating the average credit spread of an infrastructure portfolio (e.g., an offshore transmission owner, or OFTO, entity) is by triangulating the measures required using multiple approaches. These include statistical low default portfolio modeling (LDP) techniques, stress test analysis and regulatory and economic capital benchmarking to supplement default data that already exists (e.g., S&P’s infrastructure debt study).

Data can be sourced from a wide range of available market sources to construct a model using quantitative techniques. A robust suite of stress and scenario tests will act as further validation of such calibration. The average liquidity spread for the portfolio can then be derived as a balancing figure, though this can be tested using data on similar but traded assets.

A key potential source of loss is through government or government agency default. For example, the expected loss from feed-in-tariff schemes is zero in all circumstances except for a situation in which the government defaults. As mentioned above, the maximum loss given default (LGD) may be significantly lower in the case of an OFTO than for a corporate asset. In this example, both an event causing an interruption to the power line and a National Grid default are required for losses to occur.

Given that we have already seen retroactive cuts in support in some European countries, withdrawal of government support is a key risk of renewable energy investment. The design of subsidies has become more sophisticated and there is a greater risk of withdrawal or reduction of support.

Admissibility of assets: Most types of renewable energy assets are unsecured. However, a degree of security is provided by “step in” rights, i.e., the insurer can step in and control the entity rather than having a charge on the infrastructure.

Matching adjustment: Companies that wish to benefit from the matching adjustment need to ensure the assets in which they are invested are, inter alia, of sufficient quality, appropriate duration and limited scope for early repayment to meet the criteria presented in the Solvency II framework.
Risks unique to renewable energy investment

There are some specific risks to investing in this sector that are worth considering.

**Technology risk:** Equipment may become obsolete as new technologies arrive. For example, consider an aesthetic improvement to household solar paneling such that it can blend in with the look of the property to which it is attached: this will render old technology obsolete. To combat this, insurers may wish to invest in wholesale solar farms, where aesthetics are less important than in the retail market – although even here new technology could change the economics for new entrants.

**Geophysical risks:** There is the risk that unpredictable weather patterns will lead to volatility in energy generation and revenue streams. Although it may be possible to purchase weather derivatives to hedge this risk, there has been little uptake in this type of instrument among renewable energy producers. Therefore, insurers investing in renewables should consider the type of energy in which they are investing and its location. For example, UK solar patterns fluctuate very little relative to wind, so long-term solar energy yields should be more easily predicted.

**Other general investment considerations**

- **Origination of assets:** Identify the source of appropriate investments or explain where the assets originated in a relationship with a third-party asset manager.

- **Evaluating relative attractiveness:** Firms need to evaluate the attractiveness of such investments and determine an appropriate metric to use for evaluation.

- **Valuation:** A market value approach may not be appropriate given there are usually limited sales of such portfolios and limited disclosure. As such, a different methodology must be chosen, e.g., an expected cashflow or origination spread approach.

- **Ongoing portfolio maintenance:** As well as at outset, firms will typically need to invest in new infrastructure (systems and tools) as well as processes (challenge mechanisms and decision mechanisms) to regularly monitor the assets.

- **Managing liquidity:** Liquidity requirements for insurers are increasing, so while there is opportunity in “selling” liquidity to the market, a company needs to understand its liquidity position before embarking on such a strategy.

- **Diversification:** Firms may need to reassess their industry classifications, as investments in renewables may not fit within their traditional “energy firm” classification.
Concluding thoughts

Investment in renewable energy assets could provide insurers with a number of benefits depending on their individual asset portfolios and strategic investment criteria. As higher-yielding bonds mature and are replaced with lower-yielding issues, insurers may take advantage of renewable energy assets to generate additional income.

Moreover, they could also use these assets to reduce capital requirements:

- Owing to explicit backing from a stable government or government-backed agency, the credit risk may compare favorably with traditional corporate bonds.
- Given there is evidence to show that there is a relatively low level of correlation between renewable energy assets and traditional equities, this could increase the diversification benefit within the market risk module in a Solvency II context.

In conclusion, renewable energy assets are an interesting asset class that could offer a wide spectrum of risk-return characteristics and may benefit insurers across a range of long-term insurance products.
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