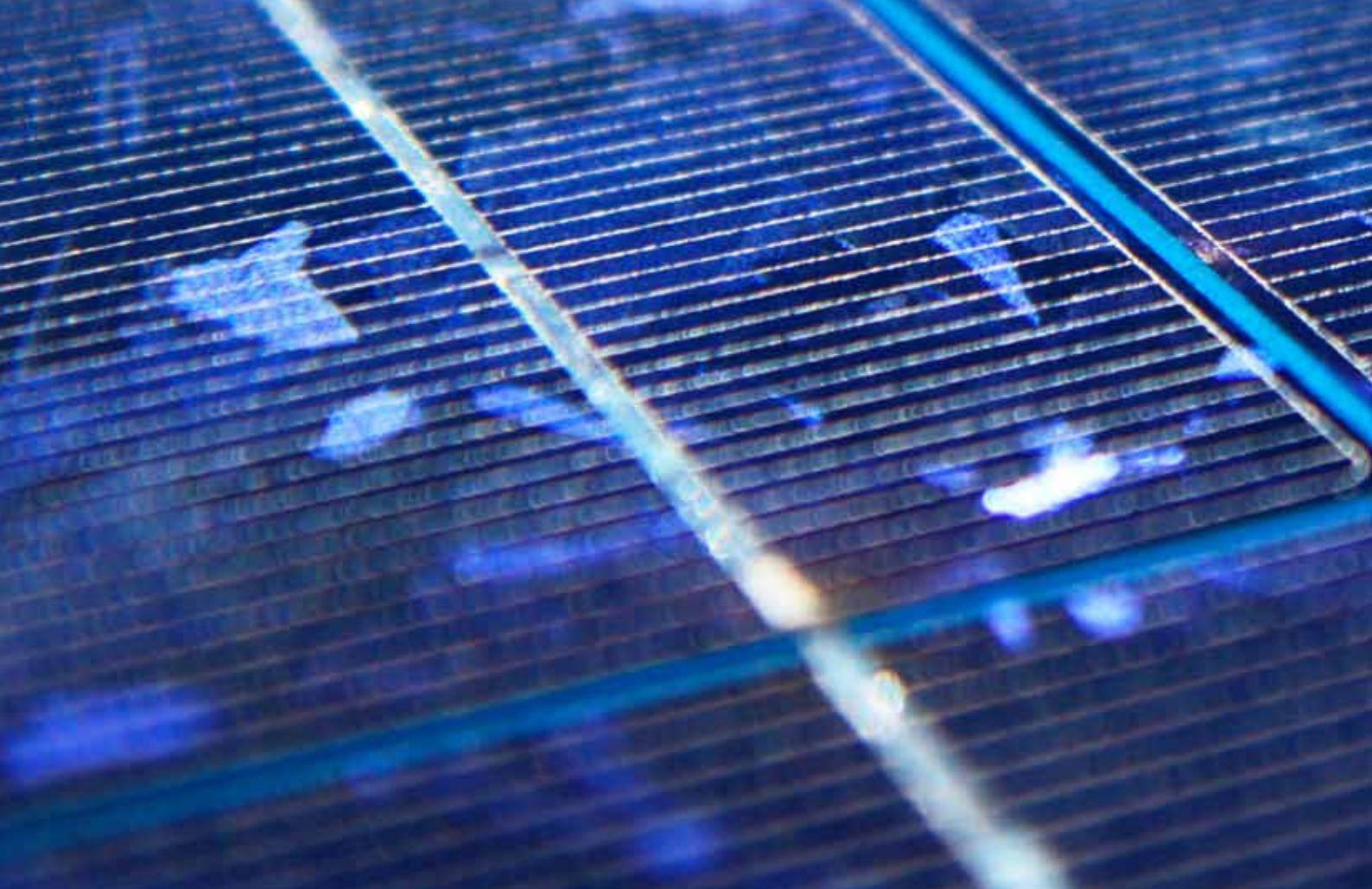
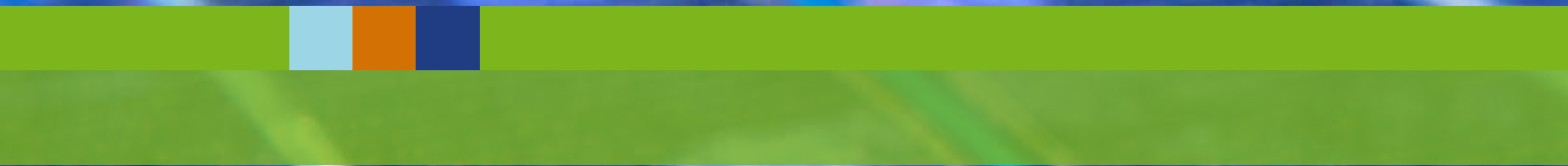


The renewable energy sector depends on natural resources such as the sun and the wind. Due to the unpredictable nature of these resources, it is often difficult for the renewable energy sector to insure against the risk of not reaching the minimum production levels. Applying Alternative Risk Transfer (ART) by means of Insurance-linked Securities (ILS) is a way to bring this risk to the capital markets. By the end of 2007, the ILS market in the US reached a peak of US\$15bn. In Europe, the ILS market is still in its infancy and offers abundant opportunities for innovative corporate finance boutiques and insurance companies.

The Art of Alternative Risk Transfer



Renewable energy is a hot topic, both in the political arena and in financial markets. Ambitious goals have been set to reduce CO2 emissions in Kyoto and following climate conferences. This has resulted in numerous programmes being set up by governments to promote the generation of renewable energy. These programmes often constitute immunization to energy-price fluctuations in order to lower the risk for the entrepreneur. As it is insensitive to the price component of turnover, energy production risk (volume) is frequently the single most important business risk.

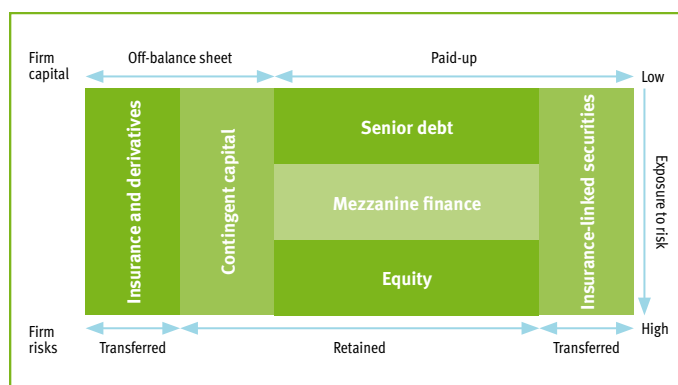
In the renewable energy sector, business risk is heavily dependant on natural circumstances such as wind production and solar hours/intensity. Shortfall risk of energy production can often be quantified by geological models. By using statistical models, minimum production levels can be estimated with various levels of confidence.

Hurricane Andrew

When in 1992 hurricane Andrew struck the south-eastern part of the US, it struck hard. It caused 65 casualties in Florida and Louisiana and ravaged small villages as well as cities such as Miami. Property damage amounted to US\$4obn, which was the highest damage value by a hurricane ever, only to be surpassed by Katrina in 2005. The damage grossly surpassed not only the actual insured value of the property, but also the potential value that it could have been insured for.

Following Andrew, a group of independent researchers and professors at the Wharton School of Economics conceived the idea of expanding the risk-bearing capacity of the catastrophe re-insurance market by means of

models aim to optimize the structure of paid-up capital to manage on-balance risk by determining the most appropriate debt-equity mix. Derivatives and insurance are used to relieve the debt and equity investors from risks better borne by third parties such as insurers. Shimpi argues that these shouldn't be separate decisions, but should be incorporated in a total risk framework and that the decision as to which risks should be brought off-balance precedes the decision about the capital mix to be used. The following graphical representation is used for the Insurative Model:



After deciding which risks are better borne by other parties, a second decision can be made: which of the remaining risks should the firm's investors take, and which risks should be transferred to capital markets in a securitized form? Risk transfer to capital markets is referred to as alterna-

securitization in the mid-nineties. Being un-correlated with returns on traditional financial markets, returns could be structured in a way that they depend mainly on the (non)-occurrence of certain geological events. This fits in well with the strategic asset allocation of institutional investors.

The insurance market faced a general "capacity-crisis" from the 1970s until the mid-nineties. Seeking additional insurance capacity, insurers looked mostly to capital markets to create additional capacity. This is how ART came into being. Products that transferred insurance risk to capital markets were baptized insurance-linked securities. Applying ART by means of catastrophe (CAT)-bonds can be a way to bring this risk to capital markets. Insuring a minimum performance level can lower a project's total cost of capital because the risk is borne by the optimal party – in other words, the institutional investor that benefits from the diversification effect of an uncorrelated asset.

The Insurative Model

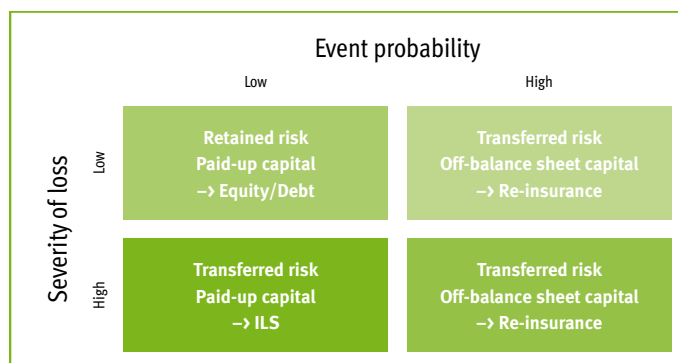
In 2001, Prakash Shimpi published his paper on the Insurative Model. The Insurative Model aims to include all risks a company faces to capital budgeting and insurance decisions. The traditional corporate finance

“The ILS/CAT-bond market is still growing in the US and underdeveloped in Europe.”

tive risk transfer, or ART, and has been an increasingly important way for (re-)insurance companies to transfer non-core risk or risk that is impossible or unattractive to re-insure. It is a way to actively manage the total company's risk spectrum.

Risk typology

Typically, insurance risk is measured along two axes: probability of an event and severity of loss. Following the model of Shimpi, it is possible to determine which risk can best be borne, re-insured or ceded to other markets with risk capacity, using the following framework (insurer's point-of-view):



Low severity of loss and low event probability means risk can be absorbed in the insurance of the company's balance sheet via its equity buffer. With high probability but low severity, the usual choice is to reinsure. Alternatively, this risk could be kept on-balance and covered by premia/equity. >>

“Risk transfer to capital markets has been an increasingly important way to transfer non-core risk or risk that is impossible or unattractive to re-insure.”

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Because risks with low probability but high severity are often unsuited for the re-insurance market, transfer to capital markets can be an interesting option.

Sidecars and CAT-bonds

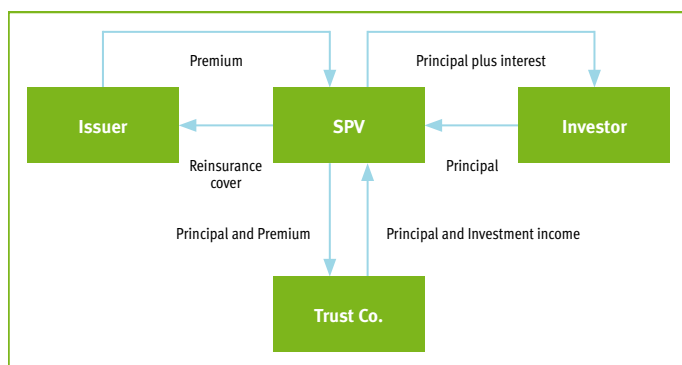
The two most notable ILS products are sidecars and catastrophe bonds, or CAT-bonds¹. Sidecars are special purpose vehicles (SPVs) created to supply additional (re-)insurance capacity for its sponsor. These mostly fully-funded structures are typically created just after a huge catastrophe when overall insurance capacity in the re-insurance market is low. Capital is infused primarily by private equity investors and/or hedge funds. After insurance premia drop following a period with few major catastrophes, sidecars are typically dissolved or consolidated with their sponsor. In recent years sidecars have served their purpose of risk-transfer from (re-)insurance

which reflects the risk. When the CAT-event occurs the notional will be passed by the TrustCo to the (re-)insurer. The structure is usually rated by a rating agency so that the investor can benchmark the return to other investment opportunities and for pricing purposes.

The return offered to the investor is usually in line with the applicable total risk/return ratio. What really makes the CAT-bond attractive to investors, is the almost complete lack of correlation between the CAT-Bonds and returns on traditional securities such as normal bonds and equities. The systematic risk is therefore low compared to the return offered. This creates an attractive gap between the return on the CAT-bond and the investors' required return, which should be based on systematic risk only. Compared to sidecars, CAT-bonds offer a more structural capacity source because of longer tenors and investor commitment.

market to capital markets when it is needed most in an efficient way. They are, however, tactical instruments for which the market is not always accessible.

A CAT-bond is a bond that is used to transfer event risk to capital markets. By using a bond structure, a collateral is created to reduce credit risk. This also makes the CAT-bond an investable asset. In the following figure, the general structure for the CAT-bond is shown:



The principal invested by the investor, is passed through the SPV to the TrustCo. To serve well as collateral it is invested in liquid high-quality credits. The insurer that wants to re-insure or lower its exposure to a certain event-risk, pays a premium to the SPV. The investor receives an interest payment based on the investment return of the TrustCo and the premium

Opportunities

At present we are seeing the shape of the ILS market change rapidly. Investment banks are switching to more traditional banking models. This causes insurance companies to look for new reliable partners with the right mix of structured finance and quantitative skills to conceive fresh ideas and the power to bring them to the market. It will be interesting to see the results of these partnerships in the future. <



▶ THE ILS/CAT-BOND MARKET IS STILL GROWING IN THE US AND UNDERDEVELOPED IN EUROPE. USING THE CHARACTERISTICS OF THESE PRODUCTS TO THE FAST-GROWING RENEWABLE ENERGY MARKET BY DEVISING INNOVATIVE APPLICATION CAN REALLY CREATE AN EXCELLENT BUSINESS CASE.
WOULD YOU LIKE TO KNOW MORE ABOUT THE OPPORTUNITIES? FEEL FREE

TO CONTACT JOOST BERKVEN'S ON +31 (0)35 692 89 89.

¹ A third one, called "Triple X securitizations" or the related "Triple X bonds" were created to deal with an accounting issue for life-insurance products.