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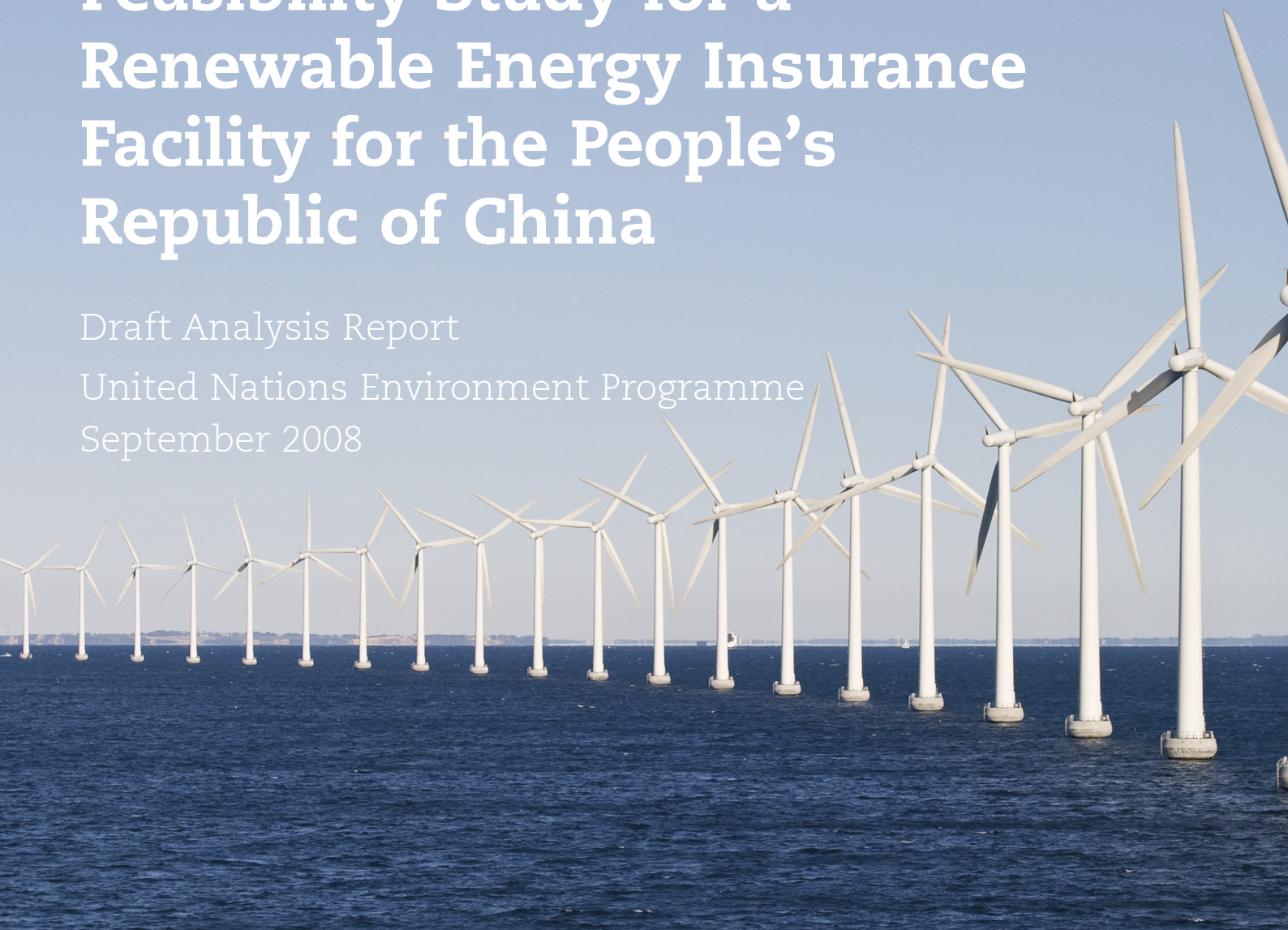
Energy Practice

Feasibility Study for a Renewable Energy Insurance Facility for the People's Republic of China

Draft Analysis Report

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1. Executive Summary



Marsh and Ascot Renewco performed a feasibility study into the implementation of a renewable energy reinsurance facility and/or development of a “Special Purpose Underwriting Vehicle (SPUV) for the People’s Republic of China with direct focus on projects related to wind energy. The development of a Specialist Reinsurance facility or Wind Energy SPUV would represent a convergence of multiple factors for renewable energy investment :

- benefit from investment grade credit rating if the reinsurance facility were structured within a Lloyd’s syndicate umbrella framework;
- attract alternative risk capital to support new risk management market structures in the emerging carbon trading market;
- attract multi-lateral lenders or guarantors within a “public-private-partnership” framework minimizing the need for them to extend risk;
- capital allocating to them a role of “re-insurer of last resort”; or
- draw specialist engineering consultancy services to a wind energy financial risk management platform on a portfolio versus project basis.

Structured interviews were held with more than 25 stakeholders covering both domestic and international insurers, domestic and international wind energy developers and domestic and foreign original equipment manufacturers. The interviews revealed that wind energy insurance is broadly available with domestic markets in China but suffers due to intense competition leading to price cutting and consequent poor underwriting results. Most importantly, the domestic insurance industry has limited underwriting experience and expertise in respect of revenue stream protection during both construction and operational phases inhibiting developers’ access to debt financing. It was concluded that the facility would be a feasible venture provided that local capacity building, focused marketing, wider product offering and marketing differentiation were made key elements of its operation. An implementation approach was described including the potential structure of a facility and the roles of stakeholders. Next steps for implementation include a Pilot Study using a renewable energy project as a test case and the marketing of the feasibility study’s results to domestic cedents and principals.

2. Introduction



2.1. Renewable Energy in China

The People’s Republic of China (“PRC”) is the second biggest energy consumer globally requiring approximately 2.8 trillion kWh in 2006. Electricity generation in China is currently dominated by coal as a fuel source (~66%) and as such China is facing increasing pressure from the international community to curb the predicted surge in greenhouse gas emissions. China accounts for some of the world’s largest projected increases in national electricity demand to the year 2030. Renewable energy therefore must be a serious consideration if China is to play a role in countering climate change.

The Chinese government passed The Renewable Energy Law in 2005 which committed the country to supplying 10% of its energy requirement through renewable means by 2020. This law has required power grid operators to purchase resources from registered renewable energy producers. Measures such as these have offered significant potential for PRC to become a global leader in renewable energy technologies including wind power. China is now the fifth largest wind-power market globally in terms of installed capacity behind Germany, U.S, Spain and India. Wind power industry statistics show that by the end of 2008, China’s total installed base of wind power production will reach 10GW, and estimates suggest that by 2010 the total installed capacity for wind power generation in China will reach 20GW.

However, this growth potential could be significantly undermined by insufficient insurance cover to provide bespoke levels of protection typically expected and in some cases required by international project developers, contractors, investors and most importantly financiers. Both anecdotal evidence and the Marsh survey suggest that the provision of debt financing is slowed by the concern of both domestic and international lenders as to the inadequacy of adequate debt service (e.g.) revenue stream protection. Recently, there is emergence of pure financial investors in the China wind investment markets which signifies an important change in trend of wind farms asset investment. Also, the recent tragic earthquake in China’s Sichuan Province only highlights the importance of protecting assets with sound and tested insurance policies. Sophisticated equity investors and a heightened awareness of asset protection should, but not necessarily drive new procurement approaches in the PRC wind sectors.

The need for financial risk management instruments to meet evolving trends needs to be addressed.

This report assesses the feasibility of developing a Renewable Energy Reinsurance Facility. The focus of the report is on wind farms in the Peoples Republic of China (PRC). However, the structure of the facility may be suitable for expansion to other Asian developing countries and other renewable energy technologies. Finally, the ability of the facility to be adapted to new areas is also commented on.

2.2. Rationale for a New Insurance Vehicle

The UNEP working group 1 study has shown there can be significant risk mitigation and financing benefits on offer to projects which can demonstrate effective deployment of Financial Risk Management Instruments. Such instruments offer increasing scope to improve the financing conditions available for renewable energy projects in developing countries. Lenders have their own stringent requirements for insurance and in many cases wish to transfer as much risk as possible to the insurance market.

Insurance market deficiencies act as barriers inhibiting the deployment of certain insurance instruments, particularly in emerging markets and developing countries such as the PRC. Barriers may differ quite dramatically in other developing countries but the key point is that immature insurance markets typically display a more limited technical underwriting capability with high regulatory barriers to entry for foreign insurers.

Areas of insurance market deficiency for a jurisdiction such as PRC are likely to include market immaturity (insurance penetration is as low as 2.7% of GDP), a lack of technical underwriting expertise, regulatory barriers to entry and an inability to meet international financing insurance requirements.

A Reinsurance facility would aim to address these deficiencies via the development of a more mature and sustainable market which will bring benefits to the developers, financiers and the insurance markets as a whole. The presence of such insurance market deficiencies in China are explored in this report.

2.3. Facility Concept

The key objective of a facility is to overcome existing market deficiencies by providing renewable energy projects with access to better coverage and new products that would otherwise not be available in domestic markets. Over time the facility needs to encourage capacity building to enable local cedents to develop more competent and sustainable underwriting businesses. At the same time, the facility would also provide for capacity building or knowledge transfer for developers and the local cedents via formal training forums, conferences and “masterclasses”, alignment with institutional bodies and public-private educational initiatives.

The underlying strength of a facility should be the ability to leverage reinsurance markets to provide highly rated security, technical underwriting, broader coverage and specialist insurance products for renewable energy projects. In short the facility concept is designed to meet reinsurance requirements of domestic insurers in a more efficient and cost effective manner.

Instead of entering into multiple facultative reinsurance contracts or treaty reinsurance arrangements which may not be designed for renewable energy projects (and thus provide more limited protection) domestic insurers will have the option to enter into one dedicated reinsurance contract covering all their renewable energy reinsurance needs.

With the ability to offer superior coverage and new products to renewable energy customers, domestic insurers could use the facility as a competitive advantage. As reinsurance terms, conditions and wordings are pre-defined, domestic insurers could focus on growing their renewable energy book of business. As well as significantly reducing the amount of time and cost required to source and administer reinsurance, the facility could also help to ease the strain on surpluses during rapid premium growth.

By providing significant capacity to the facility, reinsurers would benefit from streamlined access to fast growing renewable energy industries. The facility would enable reinsurers to overcome many of the regulatory barriers to entry. As outlined in the Executive Summary, however, a formal reinsurance facility might also create conditions for alternative risk capital on multi-lateral lenders to participate excess of loss (XOL) capacity providers or, perhaps, in respect of the provision of an insurance-based carbon credit delivery guarantee.

2.4. Rationale for Wind Focus

China has an official target of 10,000 MW of installed wind capacity by 2010 and 30,000 MW by 2020. Wind turbines are being installed at an accelerating rate in China and offer a real opportunity for renewable energy growth.

Wind offers a number of technical underwriting challenges and as such proves a good target for a reinsurance vehicle. New turbine manufacturers are being developed continuously, especially in China where domestic manufacturers are producing hybrid turbines with international manufacturers’ existing technology. At the time of this report, there are about 50 international and domestic turbine manufacturers in China. It is anticipated that there will be rapid consolidation in this sector within the next few years resulting in the emergence of a limited number of Chinese “National Champions” in the turbines manufacturing sector, side-by-side with the large international turbines manufacturers.

International insurers have good knowledge of wind risks following the profitable rise of onshore and offshore turbines in Europe and onshore turbines in the USA. Many international insurers are treating wind energy as an individual book of business to be pursued on its own merits. However, there will (and are) specific underwriting concerns that international insurers will have concerning domestically manufactured or installed on or offshore turbines: therefore, the role of the reinsurance facility as a repository of data on wind projects across the country cannot be understated.

3. Feasibility Study



3.1. Scope of Project

The objective of this report is to conduct a feasibility study for the development of a Renewable Energy ReInsurance Facility for the People’s Republic of China.

The scope of this project includes:

- Identifying and measuring the potential existing and medium-term market demand for wind energy projects in China .
- Analysing the domestic and international drivers of demand for a wind energy ReInsurance Facility in China.

3.2. Approach

The approach taken to perform the feasibility study has been to interview key stakeholders necessary for the successful operation of a facility both domestic and international as follows:

1. Interviewing wind project developers, operators, contractors and manufacturers to:
 - Ascertain the scope of wind farm development by estimating the number of existing, approved and proposed projects in China
 - Determine the key drivers to project success and the key barriers to development
 - Determine the insurance needs of stakeholders and the insurance market’s response to wind energy developments and subsequent impact on the development of the wind industry locally.
2. Consulting with Marsh colleagues in China to:
 - Understand the regulatory and legislative environment in China and how an insurance facility can do business in a compliant, efficient and culturally sensitive manner.
3. Consult with the following insurance company markets:
 - Domestic insurers
 - Domestic reinsurance companies
 - Foreign owned licensed insurers
 - Foreign owned licensed reinsurers
 - The outcome of which we would expect to help to:
 - Understand existing insurance offerings for wind energy risks.
 - Determine any barriers to the successful provision of insurance coverage for wind energy projects.

4. Interview potential international insurance stakeholders in the operation of an insurance facility to:
 - Determine the appetite of international insurers for wind energy risks in China and any barriers to the successful provision of a reinsurance facility.

3.3. Participants to the Study

A broad range of wind farm developers, original equipment manufacturers, insurers and other interested parties were interviewed for their views on the operation of a reinsurance facility for China. The majority of interviews were held face-to-face with the relevant company representatives and guided by structured questionnaires (please refer to Appendix A). Feedback from participants was extremely constructive and there was a large amount of interest from interviewees in China both in terms of a reinsurance facility and to the involvement of UNEP as an advocate for the renewable energy industry. Many participants expressed the strong opinion to see the insurance industry more engaged in the renewable energy industry with the overriding objective to see projects financed in a more timely manner.

Figure 3.1 below demonstrates the number of participants approached for the study. These companies combine over 120 years of experience in the wind energy sector. The developers and manufacturers also combine the experience of over 80 existing or proposed wind farm projects in China and over 150 projects internationally.

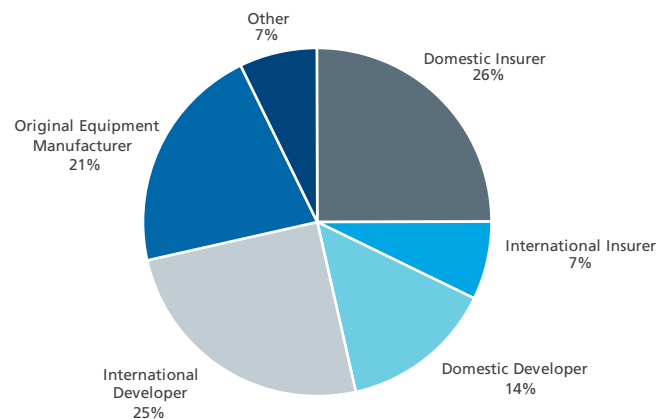


Fig 3.1 Number of participants approached for the study

3.4. Demand for Wind Energy Projects in China

3.4.1. The General Perspective

As can be seen from the experience of the interviewees alone, there are a significant number of projects due to be developed in China. Both China’s expansive land mass and lengthy coastline provide a rich resource of wind energy that can be commercially harnessed for power generation. The Solar and Wind Energy Resource Assessment (SWERA) evaluated the technically exploitable resource in PRC at 50m above ground to be 1,400 Gigawatts (GW). Current estimates of globally installed wind power stand at over 90 GW according to the Global Wind Energy Council. The developers interviewed are planning to build in the PRC what will be among the largest onshore wind farms in the world - 1 GW or more.

As cited, in 2006 the Renewable Energy Law took effect in China, a commitment to investing over US\$180 billion in order to supply 15% of China’s energy needs through renewable sources by 2020. The effect of this law has been to boost the development of renewable energy projects across the country.

The developers and manufacturers participating in this study have in excess of 25GW of wind projects planned globally over the next 5 years; 40% of these projects are scheduled to be developed in China. A significant pipeline of new business exists: however, interview feedback was consistent that the development process for wind energy projects in China is challenging

for a multitude of reasons including but not limited to regulatory risk, municipal and provincial, offtake risk, technology risk and the cultural and language requirements of the host country for foreign developers.

The developers and manufacturers participating in this study have in excess of 25GW of wind projects planned globally over the next 5 years; 40% of this is proposed in China. A significant pipeline of new business exists.

3.4.2. Geographic Distribution

Figure 3.2 demonstrates the spread of study participants’ interests in wind energy in China. Coastal areas and Inner Mongolia show the majority of activity; most noticeably offshore wind has the least current involvement or pipeline of project activity.

Grid connection approval and grid capacity is a key challenge for developers of wind projects; due to rapid growth only approximately 4 GW of China’s installed 6 GW is linked in to the power grid. Wind resource is not necessarily close to existing grid infrastructure or areas of greatest demand, especially in northern and western China. This situation is of particular concern for provinces like Inner Mongolia, Xinjiang and the Gansu Provinces in western China. And, though developers compete to develop their projects quickly in order to be the first-in-line to be connected to the grid infrastructure in those areas in which the grid capacity is limited, some wind farms have taken up to six months to be connected thereby extending the insurance coverage required for the construction period.

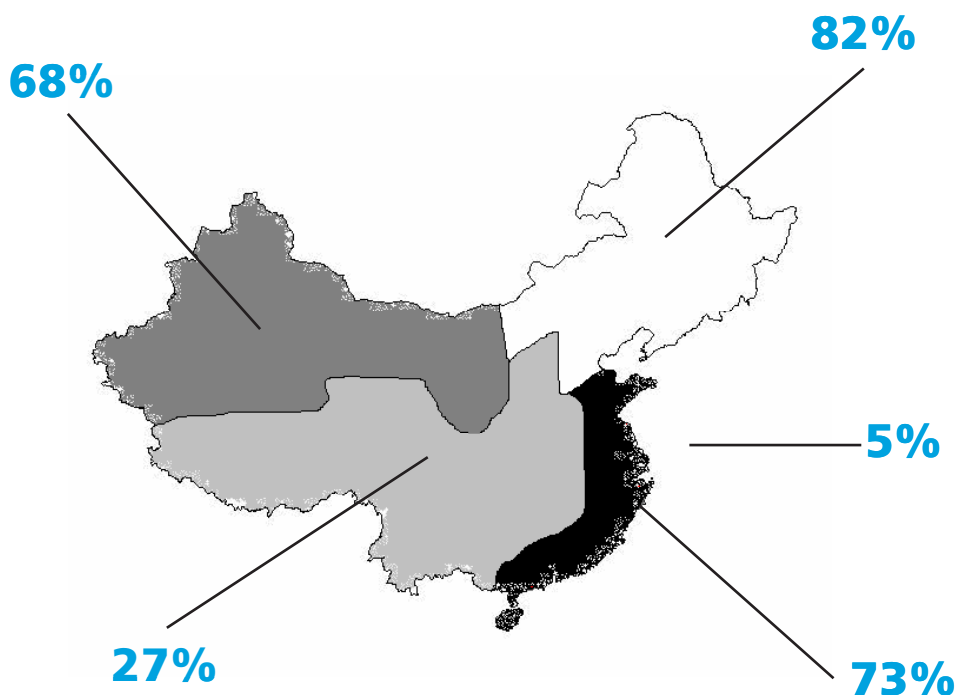


Fig 3.2 Spread of participants interest in wind energy

3.4.3. Offshore Wind Farms

The development of offshore wind farms has not been as prevalent as for onshore wind projects. One 1.5MW offshore turbine has been built by China National Offshore Oil Corporation in the Bohai Sea at the Suizhong 36-1 oil platform 70km off the coast as a ‘test case’ in order to gain the development experience in offshore wind farms project development. The only other offshore wind farm development currently approved and currently under development is the Shanghai East Ocean, a 100MW offshore wind farm development near the Shanghai East Bridge, jointly developed by a consortium of SOEs consisting of Datang Power International, China Power International, China Guangdong Nuclear Wind Power and Shanghai Green Energy Engineering As State-Owned Energy Companies (SOEs), they will not be expected to make a profit although lessons will certainly be learned from their development experience. The situation is made worse by the lower power tariff pricing for offshore wind farms in China as compared to those in Europe. It is estimated that the pricing of tariffs in China for an offshore wind farm is approximately 50% of that in Europe.

The potential of offshore wind resources and their viability in China has not been fully assessed. However, it is generally believed by one of the SOEs interviewed that development of offshore wind resources is more attractive in the southern provinces of Fujian and Guangdong, as compared to the northern coastal provinces such as Shandong. However, a developer

looking at offshore projects in this geography would have to contend with the exposure of typhoon; a frequent seasonal issue..

Offshore wind introduces increased technical challenges and risks in development as follows:

- Increased costs of construction, installation and maintenance. Direct competition with the oil and gas and construction markets for steel, engineers, vessels and other resources.
- Offshore wind generally utilises taller and higher wattage (and therefore heavier) turbines. Many types of turbines will be new to offshore and carry greater design risks.
- Inclusion of marine risks such as collision with ships and stormy seas – all clearly applicable in China with the threat of tsunamis and typhoons.
- Offshore cables that require sub-sea burial and that may remain at risk of ships’ anchor drag.

As discussed in more detail later, insurance for offshore wind traditionally lies in the marine market involving separate expertise to that of the property insurers currently insuring onshore wind farms.

3.4.4. Other Forms of Renewable Energy

Whilst the study focuses on companies principally involved in wind energy, Figure 3.3 demonstrates the interest in other forms of renewable energy. All insurers interviewed showed strong interest in all renewable disciplines, most noticeably in hydro-electric power.

Figure 3.3: Percentage of study participants involved in or planning to be involved in the following areas of renewable energy

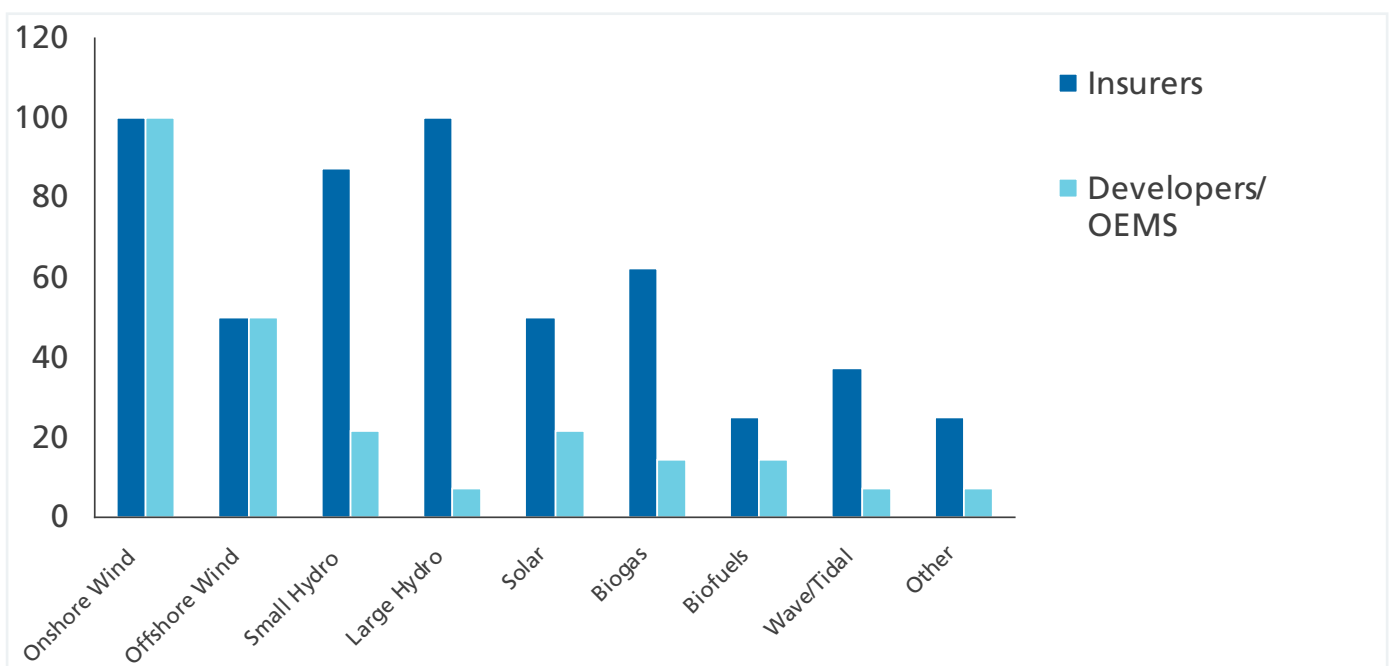


Fig 3.3

3.5. Developer & Manufacturer Insurance Requirements

3.5.1. Risk Ranking

The wind project developers and manufacturers interviewed were asked to rank the following risks in terms of importance to a wind farm project:

- **Construction/completion risk** (e.g. accidents/failures during construction that cause a delay to project completion)
- **Natural Hazards** (e.g. fire, lightning, flood, earthquake, wind storm etc)
- **Technology/engineering risks** (e.g. equipment failure, machinery breakdown)
- **Resource risk** (e.g. variability in wind speed)
- **Regulatory risk** (e.g. inability to obtain required planning/concession agreements from authorities)
- **Bankability risk** (e.g. inability to raise required finance for a project)
- **Contractor/O&M risk** (e.g. failure of contractors/O&M providers/offtakers to perform or meet contractual obligations.)

Risks were scored on a scale from 1 to 5, with 5 being the biggest concern, and 1 being the least. Figures 3.4 and 3.5 demonstrate respectively the average developer and manufacturer scores for each risk area.

For developers, the risk profile was relatively evenly spread across all categories with the exception of the

technology risk. There was general agreement that the risk of failure of the technology employed (wind turbines) would have the biggest impact on a project. International developers were particularly concerned with technology risk due to the difficulties in raising debt finance; many lenders will only invest in proven technology with high availability of output. With new turbine models being developed all the time in China, a key part of the technology risk is in gaining accurate test data regarding turbine performance and also getting the proper certification from organisations such as Germanischer Lloyd. An additional underlying risk issue appears to be the efficacy of wind turbines manufactured in the PRC with a slightly more nuanced view of the domestic OEMS. Concerns in respect of quality control / quality assurance are not new to the PRC manufacturing sector and it is not unnatural that in an emerging business sector this concern has taken root.

There was a wide range of opinion on other sources of risk to a project. One developer regarded the resource risk (wind speed) as having a low impact as the wind properties of a region could be measured and accounted for in project contingencies. Other developers rated resource risk highly due to the lack of available wind data and the impact wind availability would have on a project’s revenue.

Areas of concern for manufacturers were more heavily pronounced with bank, regulatory and technology risk clearly identified.

Figure 3.4: DEVELOPER RISK RANKING

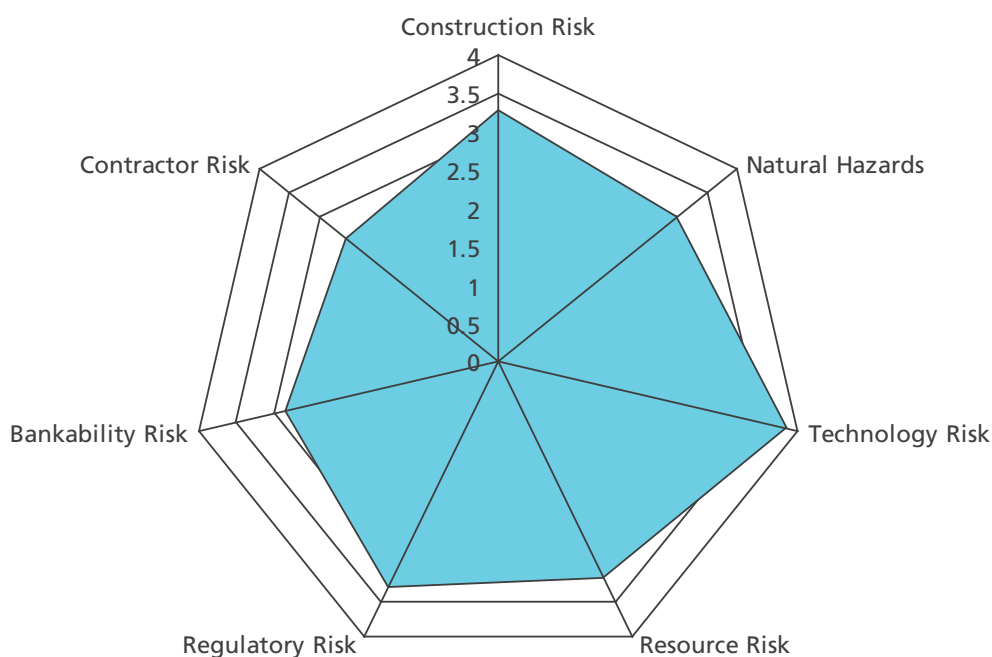


Fig 3.3

Figure 3.5: MANUFACTURER RISK RANKING

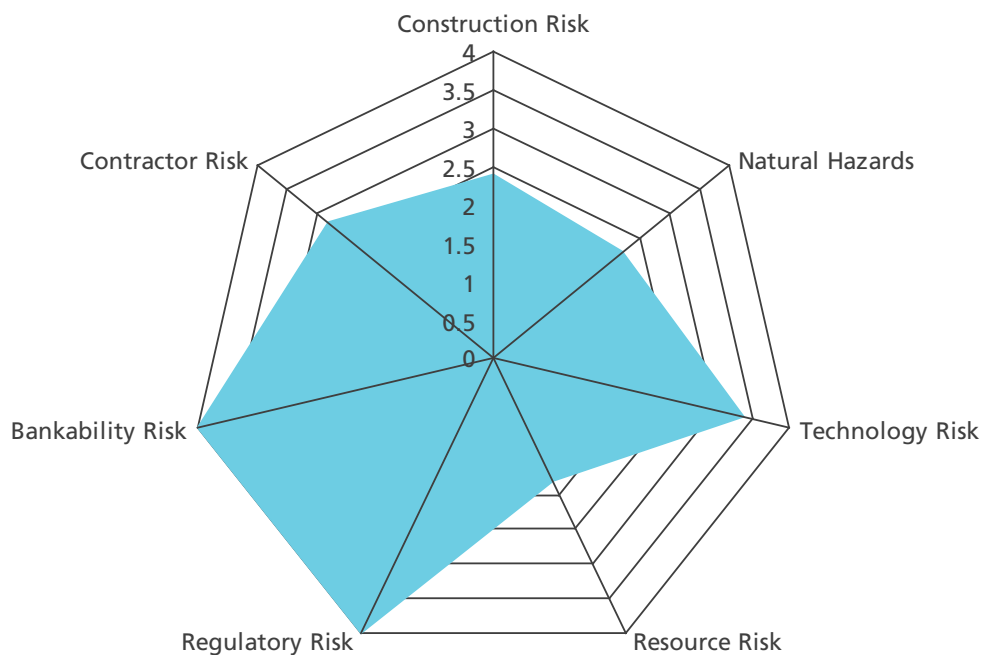


Fig 3.5

3.5.2. Insurance Philosophy

It is the philosophy of 100% of surveyed companies that insurance is purchased for wind projects that they are involved in. There is an awareness of the need for insurance and its importance; Figure 3.6 depicts the

main drivers for purchasing insurance. It is important to note that insurance procurement for physical asset protection is also driven by finance parties for the majority of developers.

FIGURE 3.6: MAIN DRIVERS FOR PURCHASING INSURANCE

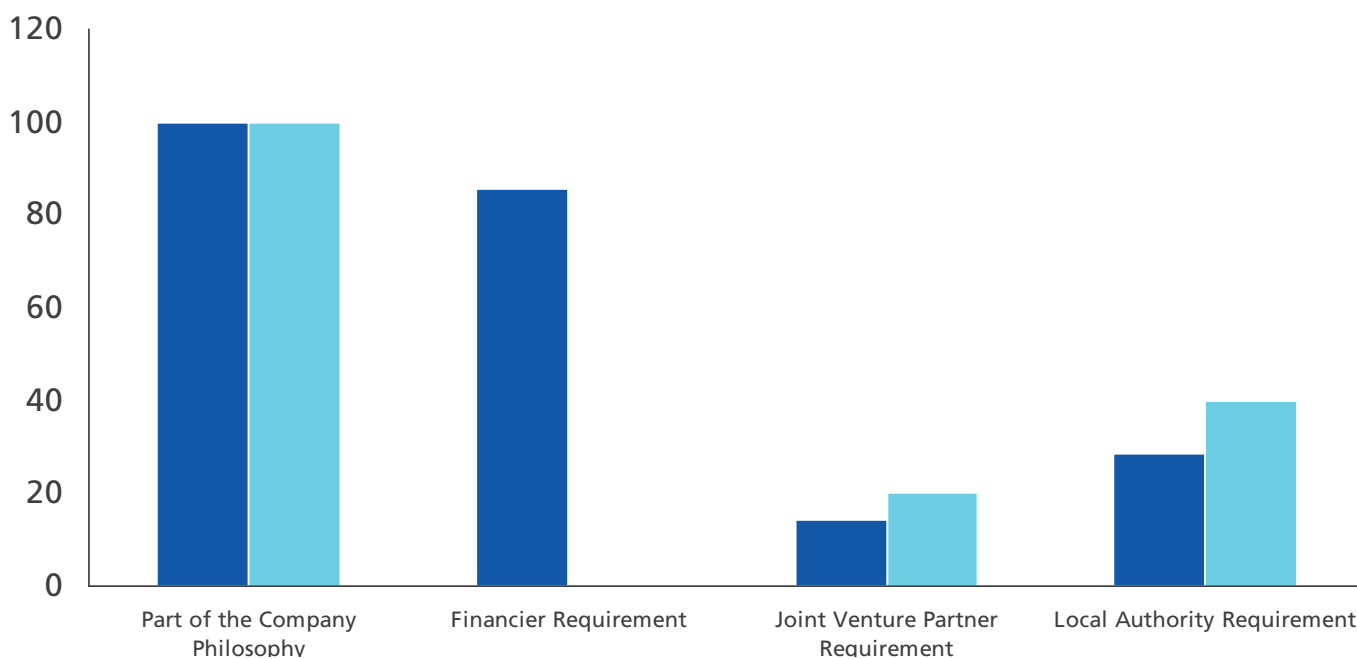


Fig 3.6

A variety of methods are used to procure insurance. International companies tend to employ international brokers to access global insurance markets – utilizing existing broker relationships and more comprehensive coverage.

For many domestic companies distribution channels are either through local agents, in-house brokers or direct with insurance companies. A direct relationship with insurers is the preferred route with SOEs; insurance “contracts” are procured similarly to other contracts through a tender process of the insurers. Figure 3.7 displays the routes for insurance procurement.

One domestic manufacturer commented that using a local broker was essential due to the perceived better and cheaper service; the close proximity in the country also allows the broker to be attentive to the local environment.

All developers purchased insurance on a project-by-project basis as opposed to including new projects into an existing company programme. It was evident that a wider portfolio basis strategy would be acceptable to some international developers if a synergy could be shown to be created in bulk purchase.

The key considerations in selection of insurance vary considerably. One of the most important considerations is the flexibility of the insurance product – principals require the insurance to be tailored to their exact project needs. Similarly the insurance product must have a wide breadth of cover to encompass key project risks such as coverage for testing and commissioning or risk of delay.

For international developers, the insurance procured should be of the highest standard – this will be influenced by the involvement of lenders and the relative level of sophistication of the international developers. This is especially so for international developers in China that require offshore financing arrangements.

Budgets for insurance varied wildly between developers; there was a relatively even spread of budgets between 0.1% to 10% of the project value. The wide range accounts for the difference between international and domestic pricing and the difference in underwriting approach within the domestic insurance markets.

All developers and manufacturers interviewed would use the services of an international reinsurance facility if an enhanced product could be offered from those currently available in China.

FIGURE 3.7: MAIN INSURANCE PROCUREMENT ROUTE

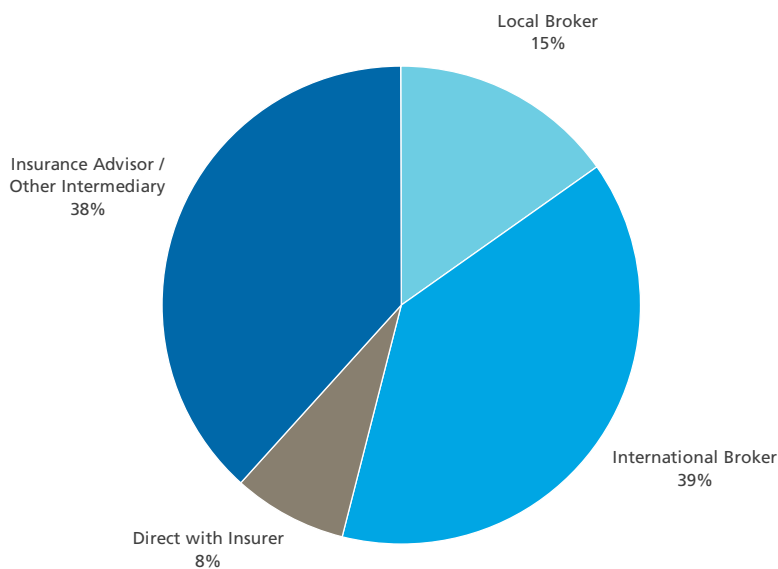


Fig 3.7

FIGURE 3.8: KEY CONSIDERATIONS IN INSURANCE PROCUREMENT

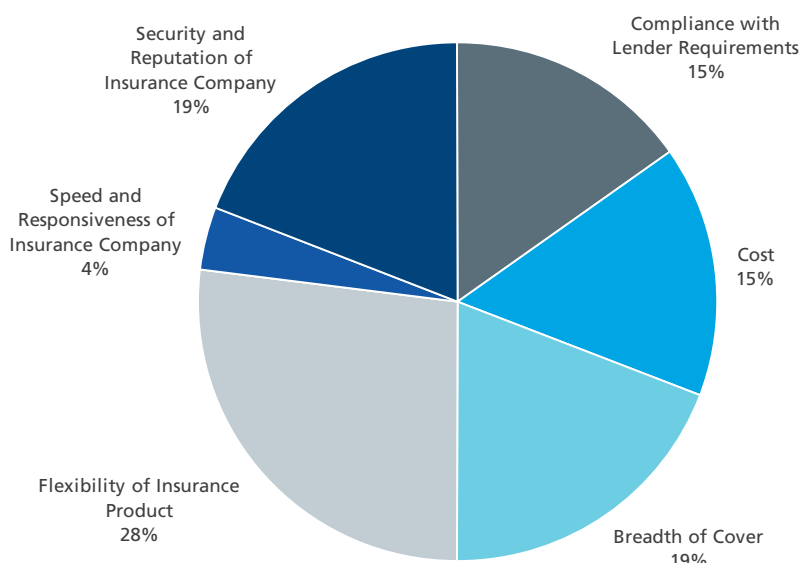


Fig 3.8

3.5.3. Insurance Coverage

Participants to the study were asked whether certain ‘traditional’ insurance products would be purchased for their wind projects. The products bought for the construction and operating phases are detailed in Figure 3.9. Excepting terrorism insurance, for which there was no appetite or perceived exposure, developers are purchasing a wide range of insurance products and Construction All Risks and Operating All Risks policies are bought as a minimum for all projects.

Delay in Start-Up and Business Interruption insurance is available though primarily, if not solely, via international insurers; however some developers have only purchased it when project finance is involved. Developers are interested in purchasing these products but the cost becomes more of a concern if the cover is not deemed essential. Another issue is that most local developers are not as sophisticated in risk management as compared to the international developers to fully appreciate the important benefits of Delay in Start-Up insurance.

The traditional insurance products are of greater concern to manufacturers during the construction phase when they are engaged on the project site.

The most frequently given reason for not insuring a risk exposure was that a company was willing to retain that risk for themselves. Availability or pricing of insurance was not given as a barrier to transferring risk. Some local developers indicated a lack of awareness of the available insurance products in the international market. However, it should be noted that in a few instances, international developers did not fully understand the role delay in start up and business interruption insurance can play in “securing” debt service obligations and enhancing project bankability.

In general terms, whilst the insurance products are known and available, their role as an instrument of security to project financiers may be poorly understood.

FIGURE 3.9: PERCENTAGE OF DEVELOPERS PURCHASING TRADITIONAL INSURANCE PRODUCTS

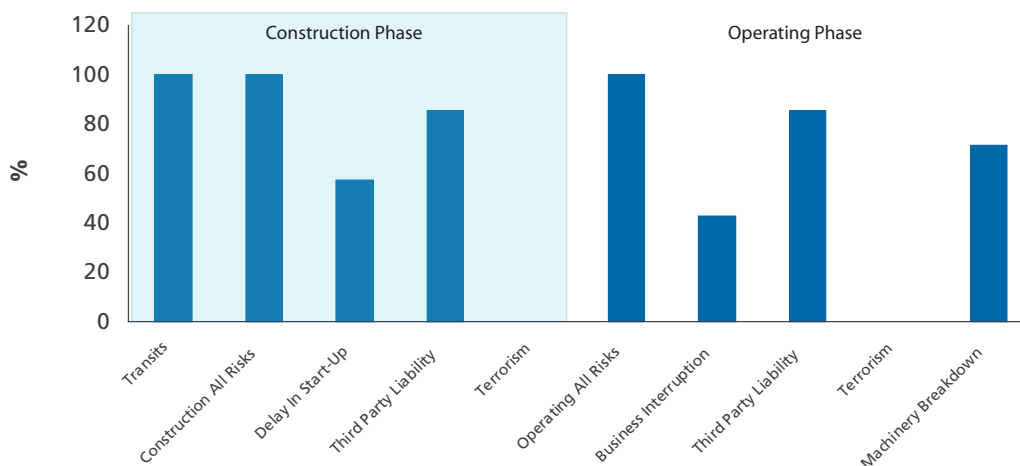


Fig 3.9

3.5.4. The Developers' Environment

The environment in which developers operate in China can be summarised from the interviews as follows:

- There are very few foreign developers in China, and the majority of wind farms are controlled by the Chinese State Owned Enterprises (SOEs - the largest top 5 energy companies) or local domestic developers.
- There is low power tariff pricing as compared to Europe and North America which results in a lower Internal Rate of Return (IRR) for onshore wind farms in China. Typically, an onshore wind farm in China is commanding an IRR of about 8% on a free cash-flow basis (taking into consideration potential CDM revenue) and between 12% to 14% on a dividend basis as compared to Europe or North America that is, based on feedback provided, closer to 20%
- Foreign developers face an entirely different business development process such as limited access to opportunity and the political skill to obtain project approvals (including grid access and land) – factors which will limit most foreign developers involvement. Unfamiliarity with the China market is one of the key obstacles for foreign developers. For example, the process of development in China is quite different from North America or Europe as the Power Purchase Agreement (PPA), a core document in all project financings, are not signed and agreed at the start of the project. In place of such arrangement, the China NDRC would issue an approval which in effect is similar to the PPA used in North America and Europe.
- The wind energy market is policy driven and there is a rush for projects in view of the very favourable policy support (pricing of the green-power, guaranteed purchase of power from wind farms from grid).
- Cost per kWh of wind farm produced power is much more expensive than coal-fired power.
- The domestic developers would do the Engineering Procurement Construction (EPC) themselves in the majority of projects, under the supervision of the Original Equipment Manufacturers (OEMs). So, this is not a "full" EPC contract.
- "Project Economics" are of much more importance to international developers (mostly relying on Project Finance). Local developers are less concerned; many wind farms have been built as they form the most expedient way to meet the renewable energy mix as mandated by the national Renewable Energy Law. In fact, many developers subsidise wind farm investment at a loss as they make-up only a small proportion of their power portfolio. SOEs cannot get approval for coal-based power plants (which is their central business) if the mandated renewable energy mix is not met within their portfolio.
- Very few projects have international project finance due to the difficulties of raising foreign currency financing. The situation is made worse with the tightening of credit at the writing of this report by the NDRC to contain inflation and hot money flowing into China to speculate on the appreciating of the Chinese currency.
- Domestic developers are eager to work in partnership with foreign developers with the interest primarily on transfer of technology, overseas development opportunities and international management expertise. This is a very young market in terms of development and operating experience. Similarly, foreign developers are equally keen to partner with the right domestic developers to benefit from the CDM revenue stream, access to onshore Chinese bank financing, access to the local relationship with the state-owned grid company and in obtaining the various approvals for projects.
- Certified Emission Reduction (CER) revenue stream is, most of the time, not taken into consideration (or viewed as a "bonus", over and above the sale of power) for the domestic developers. Some have their own development capability on Clean Development Mechanisms (CDMs) but others would rely on consultants in the market. However, this is an important consideration for foreign developers as CER revenue can be a significant contributor to project returns. The CDM Law in China mandates that the Chinese partner must command at least 51% majority in a Sino-foreign joint venture projects in order to qualify for the CDM.

3.5.5. The Manufacturers' Environment

- Due to the Chinese government requirement for local wind power equipment procurement of at least 70% as issued by the National Development and Reform Commission (NDRC) in 2006, overseas OEMs have set up their own entities in China to supply to the Chinese market. However, there has been a gradual reduction in market share for international OEMs ever since. The local OEMs are mostly joint ventures working under a licensing agreement from foreign OEMs and especially for the lower-rated wind turbines. Local OEMs have few barriers to research and development investment and are taking away market share from the larger foreign OEMs, many of whom focus on producing the higher wattage (>1MW) machines. All technologies essential for wind power generation remain in foreign hands and it has been commented by some manufacturers that China's strategy is to learn the technologies through purchasing foreign equipment.

- Local OEMs are far more competitive in pricing than foreign OEMs. However, the reliability of the technology and after-sales services/maintenance capability is in question. Generally the larger, more established domestic OEMs are perceived to be superior with the smaller size machines. Wind turbines above 1.5 MW by international manufacturers would still command a certain premium in pricing as compared to the domestically made smaller machines.
- There is a trend among the international and domestic OEMs to take equity interest in the operation of the wind farm themselves. Vertical integration is happening along the value chain with wind turbine manufacturers taking equity interests in key sub-component manufacturers and wind farm development.

3.5.6. Power Pricing Policy

Wind-power developers are regulated in two major ways in China: an NDRC-led concession program or approvals by provincial governments. The concession programme is dominated by SOEs whilst foreign developers have to deal with provincial governments and power tariff pricing policies that are perceived to be unpredictable or simply uncertain.

Many projects have been won by SOEs on loss-making power prices due to the bidding procedure of the first rounds – domestic developers interviewed in this study reported that many existing projects are operating at a loss. The latest concession project bidding recognised that the lowest price would be unsustainable - 950 MW of wind farms projects have since been awarded to bidders with the price in the mid-range of all bids submitted (\$0.06/kWh - \$0.072/kWh). If these projects can be seen to be commercially successful going forward then foreign investor interest may strengthen and SOEs may become more concerned with protecting their revenue streams with insurance products.

Power purchase prices for many new wind projects in the provinces are also increasing (\$0.074/kWh - \$0.088/kWh) – higher than awarded for the concession projects – giving much greater potential for profit making ventures.

In general, the power tariff pricing of China wind power market is on an upward trend. Although it started at a low base, the continuous lobbying and political influence applied by the SOEs and other international players in this sector have had a positive and healthy effect on the power tariffs. Although there is no PPA for a wind power tariff prior to the construction of the project, the pricing benchmark set by various projects has now given more certainty and confidence to international investors and developers in this sector.

3.6. Insurance Supplying Stakeholders

3.6.1. Available Insurance Products

Nine out of ten interviewed insurers had provided insurance or reinsurance products to a wind energy project in PRC.

Figure 3.10 demonstrates the number of insurers offering traditional insurance products to Chinese projects.

The most commonly requested cover from insurers is Construction All Risks. There is also a general awareness of the availability of Delay In-Start-Up cover due to marketing efforts of brokers; however demand for DSU is low unless project finance is engaged. Generally, domestic insurers will only be able to write DSU insurance when reinsurance support is available on a facultative basis (DSU is usually excluded from their treaty reinsurance). Another obstacle for procurement of the Delay In Start-Up cover is that projects that are financed by Chinese banks onshore do not demand it. Also, the unsophisticated nature of the Chinese insurance markets is such that this is not very well understood in terms of how this can be properly arranged. So, the project developers would need considerable guidance for implementation and education in order to see the benefits of the cover.

In contrast, demand for business interruption cover is far higher.

Inquiries for terrorism are very rare except for landmark buildings and it is not considered a significant exposure for wind farms in China by insurers and developers alike.

Domestic insurers would look to a reinsurance facility being able to provide new coverage elements to existing insurance product lines or new insurance products (e.g. Turbine Warranty protection and Carbon Delivery Guarantee) altogether. The domestic market for traditional products is hyper competitive presently (e.g. warranty protection).

FIGURE 3.10: PERCENTAGE OF INSURERS OFFERING TRADITIONAL INSURANCE PRODUCTS

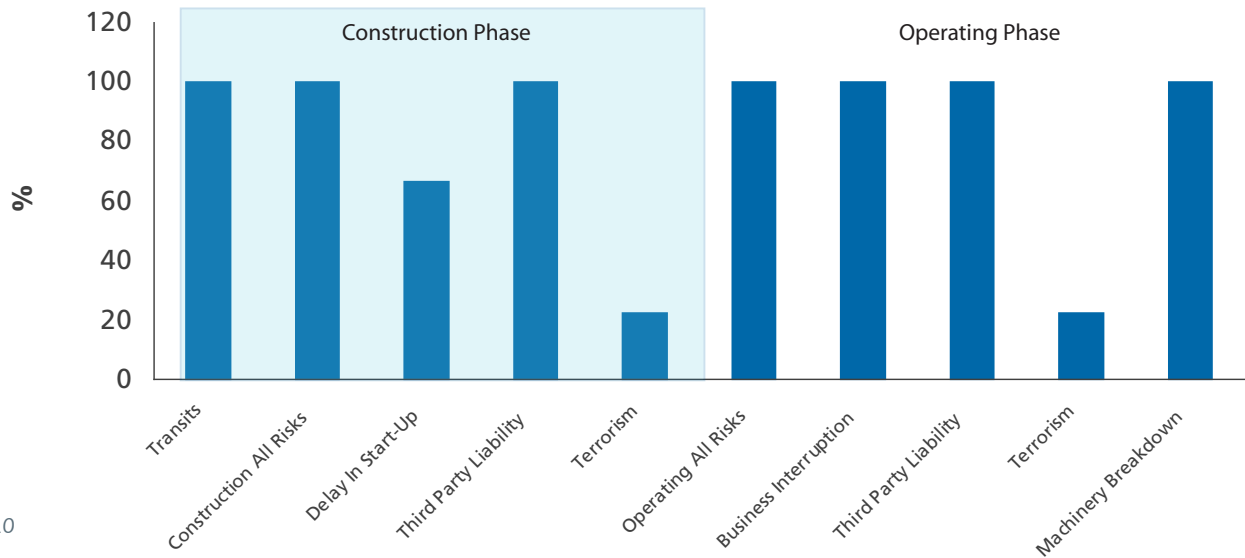


Fig 3.10

3.6.2. Insurance Pricing

The domestic insurance market is subject to severe and intense competition. When questioned, domestic insurers considered the pricing to be too low and unsustainable. A common reason given for the price competition is the lack of understanding by insureds over the difference in policy coverage offered between different insurers. The difference in premium rates on each project is large, and very much linked to competition during the insurance tender.

One insurer interviewed suggested that the CIRC (China Insurance Regulatory Committee) should work with the renewable energy sector and insurers to prevent unsustainable underwriting results through excessive market competition.

Domestic insurers take the view that there is very little pricing power for traditional insurance products unless they are wrapped into some new product lines (such as Warranty Insurance and Carbon Delivery Guarantee Insurance).

Internationally project financed wind farms are commanding much higher premium rates (in some cases up to 10 times higher) compared to non-project finance wind farms. Usually, project financed wind farms will have professional brokers involved with tailor-made bespoke policy wordings.

3.6.3. Losses

Most insurers that contributed to the survey reported that their loss ratio for renewable business was “quite bad”.

The difficulty many of the domestic insurers face is that the exact loss ratios for renewable business are not known. There is no systematic analysis as wind projects are written within a much larger property or casualty portfolio and have not been separated to manage the risk portfolio independently. This is a significant contributor to the current ‘price war’ as claims feedback is not influencing the tender process of new projects. It also indicates a lack of underwriting expertise specific to wind; many projects are rated on a similar basis to other physical assets.

Insurers have mainly suffered losses by action of typhoon and windstorm (especially in the southern provinces), machinery breakdown during turbine operation and lightning strike. One insurer expressed concern with sand storms and the impact of sand particles on blades and gear boxes.

3.6.4. Reinsurance Facility

Eight of the ten insurers interviewed were interested in a reinsurance vehicle facility and considered it feasible to implement. The commonly held view was that a facility would help to build up a stronger pool of projects through aggregation of risks.

Two large domestic insurers felt that the facility would not be feasible if based purely on offering additional insurance capacity. The domestic insurers surveyed could together provide over \$2billion of capacity (on a total sum insured basis) with their existing reinsurance

arrangements (an average of \$300 million per project on a net plus treaty basis). Other opinions offered by the domestic insurers were that the facility should also offer the following as a minimum:

- Many domestic underwriters do not have the technical knowledge to write wind business – domestic insurers would want international insurance involvement for their knowledge of the industry, risk assessment, loss data and areas of coverage. They would also expect transfer of such knowledge to the domestic market; many existing reinsurance arrangements are not assisting the domestic market to improve its own underwriting expertise.

- The facility should offer new policy coverage or product lines to create differentiation from the existing competitive domestic market and to exceed the limitations of existing treaty arrangements thus enabling the facility to be used.

Figure 3.11 shows the main barriers to the operation of a reinsurance facility. Clearly many domestic insurers feel that their clients are receiving adequate insurance provision from domestic markets. Existing treaty arrangements will also be a key barrier to a new facility; some domestic insurers will be bound to reinsure through existing mechanisms. No insurer highlighted any issue with regulatory or legislative restrictions to implementation of a facility.

FIGURE 3.11: Barriers to Operation of an International Reinsurance Facility

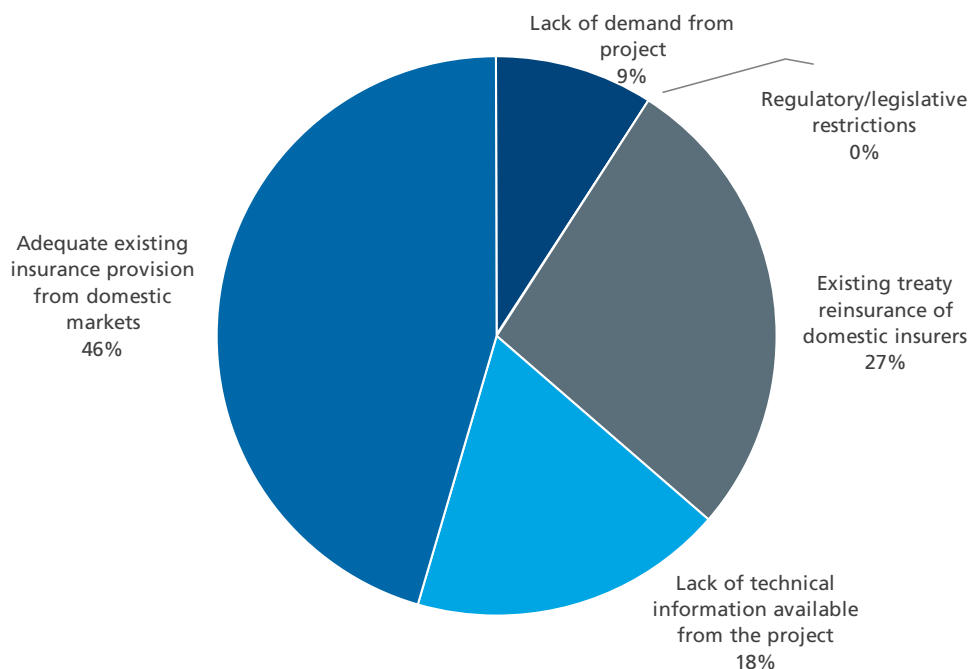


Fig 3.11

3.6.5. Offshore Wind and Other Renewable Involvement

Offshore wind power in China is only recently being explored by way of prototypical projects – effectively test sites for the technology. One turbine in Liaodong Bay in the Bohai Sea is fixed to a jacket platform structure linking in with the central platform for the China National Offshore Oil Corporation oil field.

International insurers have built up expertise in offshore wind through the prevalence of projects in Europe (amounting to greater than 2 GW). In contrast, domestic insurers have limited knowledge of the offshore discipline. International insurers could therefore lend significant technical support to domestic underwriters

as the number of offshore projects increases in China. Similar comments can apply to other forms of renewable energy. Insurers have shown more interest than in just writing wind energy and the same principles for a facility could apply to other areas.

Insurers have indicated that current reinsurance treaties would exclude offshore wind which would therefore give a reinsurance facility that has experience with offshore risks a strong opportunity.

3.6.6. Legislative and Regulatory issues

There are few barriers to the operation of a reinsurance facility in China. Foreign reinsurers are free to write reinsurance of domestic companies licensed by the China Insurance Regulatory Commission (CIRC). Reinsurers should consider becoming licensed in China however a licensed domestic insurer is allowed to cede reinsurance to a non-admitted (unlicensed) reinsurer. Therefore licensing of the reinsurers is not essential for the operation of the facility.

However, the ceding of non-admitted reinsurance is restricted by the obligation of the cedent to utilise fully the available capacity of the domestic reinsurance market. This may seem a steep barrier to the reinsurance facility but the offer to domestic reinsurance markets is largely an administrative exercise. Many reinsurers decline the offer and this regulation is losing weight. For example, cession to China Re used to be compulsory but from January 2006 this obligation was removed. Pure fronting is prohibited by the CIRC i.e. the local cedent has to retain a percentage of the risk. There is no current restriction on admitted reinsurers retroceding to non-admitted reinsurers.

Insurance taxes are administered by the domestic cedent and are included in the insurance premium charged to the principal. The facility should not have to administer any taxes as any additional taxes are not paid by non-admitted reinsurers.

4. Conclusions on Feasibility



4.1. Summary of Opportunities and Challenges

The interviews with stakeholders to wind energy insurance in China raised a number of issues for the implementation of a reinsurance facility. These issues, both positive and negative are summarised below:

4.1.1. Opportunities

1. A significant amount of new wind business is being developed in PRC (and actively encouraged by government policy).
2. Traditional insurance products can be easily adapted to other forms of renewable energy once reinsurance relationships have been developed.
3. International insurers can offer significant and desired underwriting expertise and business knowledge to the domestic insurance markets.
4. There is an insurance-buying philosophy amongst developers and manufacturers for wind projects.
5. Domestic insurance capacity alone is not sufficient to cater to the needs of international developers and international finance.

4.1.2. Challenges

1. High price competition within the domestic insurance market.
2. Low awareness of product differentiation on insurance lines.
3. Domestic insurers have existing treaty reinsurance.
4. Some wind farms operating at a loss – international finance will need to be assured of the project economics before investing.
5. Development costs of facility e.g. marketing, drafting product wordings.

4.2. Feasibility of the Reinsurance Facility

Demand for a reinsurance facility clearly exists from domestic insurers in China. The majority of stakeholders interviewed indicated that the facility would be a valuable addition to insurance services provided in China and that the facility would be feasible to implement.

To reflect on the challenges identified above, there are some barriers to overcome but in theory none would prevent the facility from operating. The most important element of the facility would be that it differentiates itself from the currently available insurance/reinsurance products for the renewable energy market. If the facility

offers a different product than existing reinsurance treaties will not be able to compete due to their more restrictive treaty authority arrangements. The facility must also be successful at marketing its offering to a wide variety of stakeholders – an improved product can justify higher prices. The costs of marketing such a facility could be high initially but the costs could very quickly be dispersed between stakeholders e.g. local cedents, local intermediaries, reinsurers, the facility manager etc.

A strong will to develop better underwriting practices coupled with the increase in development of wind farm business leads to the conclusion that a reinsurance facility for wind energy projects in China is feasible. However the facility must include the following elements in its operation:

1. A differentiation in approach for the following three potential insurance principals: international companies; joint ventures between international and domestic companies; and domestic companies. Each type of principal will have differing requirements for insurance procurement.
2. The facility must offer a range of insurance products with significant diversity from the products currently available to allow domestic cedents to avoid existing reinsurance treaty arrangements and/or attract interest from marketing to potential principals.
3. The facility must offer the ability for the local cedent to develop their own expertise in partnership with the reinsurance panel.

The following section addresses the key approach for the implementation of such a facility.

5. Implementation Approach



In this section the approach for implementation of a renewable energy reinsurance facility in China is discussed.

5.1. Structure of Facility

The facility should be structured to combine the optimal balance of underwriting leadership, highly rated (Standard & Poors A-) security, capacity, technical expertise and claims handling experience.

It is envisaged that the facility will utilize established renewable energy leaders with existing business relationships and experience in the Chinese insurance market. In terms of capacity requirements, it has been established that substantial local capacity exists so the facility would seek to have in place a flexible working line which can respond to cedents needs on a per project / per risk basis.

Cedents that have been approached as part of this feasibility study and have shown an interest in working with a reinsurance facility are shown as follows:

Insurer	Capacity
All Trust	\$150m EML basis
Bank of China	\$210m TSI basis
CPIC	\$400m TSI basis
Huatai	\$400m TSI basis
PICC	\$400m TSI basis
Sunshine	\$108m EML basis
RSA China	\$280m TSI basis
Ping An	\$480m TSI basis

TSI = Total Sum Insured

EML = Estimated Maximum Loss

It is envisaged that as total insured values increase (as projects and portfolios increase in size) the facility could provide up to \$500m of capacity.

Despite the rapidly growing expertise and capacity of local players, the Chinese non-life market is in need of further capacity and expertise in specialist areas. In niche areas such as wind energy, insurance remains unevenly applied, as local companies don’t fully understand the technology and feel uncomfortable with products such as delayed start-up and business interruption.

As discussed previously local market underwriting conditions are to a large extent driven by the significant treaties with international reinsurers. It is understood that many existing treaties accept wind farms as standard property risks.

As a result, rates for wind power projects also experience the same intense competition in the insurance market as standard property risks which has allowed rates and deductibles to fall below international levels.

Despite the prevailing low rates it is anticipated that the facility can provide competitive pricing on a selective basis where loss ratios support this approach. Higher rates are expected for facultative business in instances where risks that are either too large to fall within the treaty capacity (even on a coinsurance basis), or are specifically excluded from the treaties. As detailed below there are several areas of coverage which may not be included in treaties. It is also anticipated that the availability of broader coverage and new products areas will enable a higher premium to be charged.

The presence of international reinsurers will also provide confidence to international wind industry players (such as turbine manufacturers and investors) considering entry or further growth opportunities in the PRC. Leaders will have authority to bind other subscribing markets to enable a fast response and turnaround to new underwriting submissions.

Domestic insurers would be given the opportunity to participate at different levels of retention provided these are acceptable to project sponsors and finance parties. Domestic insurers will have an important role to play in leveraging distribution channels and accessing a strong, institutionally linked, customer base to enable the facility to reach critical mass. Over time as the pool of projects underwritten by the facility grows and a more accurate picture of the loss history and operating performance of the facility will be available. This will enable more informed underwriting decisions, aggregation management and more sustainable pricing approach.

For China wind projects, the leading insurance providers are PICC and Alltrust. Both are Chinese insurance companies with considerable experience in the energy sector that provide property and cargo coverage for wind projects both in the construction and operation phases. In addition, they can provide third party liability coverage at a minimal cost. It is our intention to develop

a manuscript form of cover but to be issued by PICC, Alltrust or similar domestic insurer to meet the admitted requirement of the Chinese insurance law.

Given PICC’s market position and realization that they have been locked in to advantageous treaty rates for the past year, they are a very competitive and important insurance market for the wind business. It is, however, critical that a comprehensive marketing plan be executed to ensure adequate competition and ultimately a more comprehensive insurance product. Without the introduction of competition, savings of this kind would be extremely unlikely.

5.1.1. Facility Manager

The facility manager will have a key role in structuring and securing highly competitive and technically competent reinsurance capacity to support the facility. This will need to be in compliance with legal and regulatory requirements and sensitive to local customs and business practice. As most risks in China are presented with very little underwriting information the facility manager will also have a role to play in highlighting key information requirements and using proposal forms to build an underwriting submission.

A further critical role of the facility manager will be the effective marketing of the facility to local cedents and other potential stakeholders. As illustrated by this study’s results there is limited awareness of the broader coverage available through international reinsurance markets.

The marketing approach will need to focus on five key customer relationship levels:

- The principal - International and domestic project developers will need an explanation of the facility product and the differentiation from existing options. The facility manager will need to impress the wider wind power community to encourage potential insureds to be asking for the facility’s products. However the local broker will have the biggest role in impressing upon their clients the necessity of the facility.
- Direct intermediary / agency - Intermediaries must have knowledge of the facility to market to principals. They will need to be familiar with the products offered by the facility and their differentiation from other products available in the domestic market.

- Local cedent – The cedent will be the key link for access to projects in China. Marketing will need to focus on the benefits conferred to the cedent in the facility relationship such as training and an enhanced insurance product offering.
- Reinsurers – A reinsurance panel must be able to work consistently together. As product offerings change to suit demand, the reinsurance panel should be constantly reviewed in line with the actual service provided by the facility. The panel will also need to maintain a minimum standard of security rating.
- Banks / lenders – The requirements of lenders for high quality insurance will carry weight with financed projects in China. Successful marketing by the Facility Manager and UNEP could ensure that lenders insist the reinsurance facility is explored as an option when the project procures insurance. There is a role for greater public-private initiative in this space and for multi-lateral lenders to participate more actively in developing banking risk management “best practices” that increase consistency and reflect global norms.

The Facility Manager, in conjunction with local cedents, should recognise different marketing strategies between international and domestic principals and have appropriate methods of communication for each.

As the interface between international reinsurers, domestic insurers and customers the facility manager will also need to provide both international placement and local servicing capabilities. These will include a range of support services such as:

- Issuance of contract documentation and evidence of cover – the Facility Manager should oversee the handling of insurance documents. This could operate by the Facility Manager having the authority and services to issue documentation themselves on behalf of the reinsurance panel. Alternatively the lead reinsurer could issue documents directly.
- Premium handling – the Facility Manager should be able to issue invoices and collect payments on behalf of the reinsurance panel. The Facility would be remunerated by percentage commission of the premium.
- Loss adjusting and claims management services – the Facility Manager would ensure that reputable loss adjusters were appointed in the event of a claim and manage the claims control issues between the cedent and reinsurers. The objective would be to build consensus of opinion over a claim and ensuring that the cedent does not obligate reinsurers to pay an invalid claim whilst ensuring that the principal achieves fair settlement.

As well as working on behalf of the insurance and reinsurance markets the facility manager could also provide key risk management support services to renewable energy projects. These could include:

1. Project Risk Assessment/Risk Engineering Surveys including risk benchmarking against other projects (can be provided by Marsh Risk Consulting/ Marsh Risk Engineers)
2. Onsite Inspection and Audit (can be provided by Marsh Risk Consulting and/or insurance company)
3. Incident/Accident Record Review (can be provided by Marsh Risk Consulting)
4. Project Monitoring (can be provided by Marsh Risk Consulting)

In order to build up the capacity on risk and insurance issues for Project Developers, it is strongly recommended workshops be promoted together with the cedents selected and in conjunction with the Project Developers. These are some of the suggested topics of interests to be considered for the workshop.

1. Financing and wind farm investment in China – Risk issues and solutions
2. The UNEP Reinsurance Facility – How this would benefit you?
3. Wind Farm Project Development – The cradle to grave insurance solution
4. Carbon Delivery Guarantee – Why this is important for wind farm developers?
5. Turbine Warranty Insurance and Long Term Maintenance Agreement
6. Protection of revenue stream in your project – Why this matters?

5.1.2. Reinsurance Panel

The main steps in the underwriting process of the facility will be:

1. Risk Assessment

The first step is to review the underwriting submission provided by the local cedent to determine if the risk meets insurability criteria and whether any further underwriting information is needed in order to fully evaluate the risk.

An important aspect of this initial process will be the completion of a proposal form listing the specific information requirements of the facility underwriters.

Facility underwriters will use underwriting tools and their experience in underwriting international wind energy projects to review and assess key aspects of each risk including:

- a. Site details such as ground and sub surface details, topography and climatic conditions
- b. Construction and installation methods
- c. Natural perils and catastrophe exposure (e.g. earthquake, windstorm, flood, ice / freeze)
- d. Quality and reliability of wind turbine model
- e. Maintenance and servicing of turbines
- f. Lead times on critical items and associated supply chain exposures
- g. Verification, certification and assurance of project / turbine design, site, and installation methods
- h. Experience track record and quality controls employed by turbine manufacturer, operator, contractors, O&M providers etc
- i. Warranty provisions
- j. Loss history
- k. Business income
- l. Site security (fencing, manned security etc)

The quality of the underwriting information will be a critical factor in the reinsurers’ appetite and willingness to accept risks. Any risk engineering and survey reports will be a valuable tool supporting the assessment of risks and the intermediary will play an important role in the raising awareness of the need for and availability of such information.

The Figure below provides an example of the loss data that underwriters would refer to in assessing risks.

Fig 5.1 Historical earthquakes, magnitude 6 or greater (780BC – 1994AD)



2. Pricing

Reinsurers will need to determine a price which is sufficient to cover the expected cost of acquiring the business, administering it and paying claims. To arrive at a price facility underwriters will employ a combination of experience and exposure based models. Experience based models will use historical claims experience applied to the current situation. As the availability of loss data on wind farms in China is limited, participating reinsurers will use a range of tools including their own loss data, comparable industry proxies, expert opinion and experience based on business written in the US and Europe.

For natural perils such as wind storm and earthquake facility underwrites will use sophisticated and internationally recognised exposure based models to determine suitable pricing.

3. Monitoring and control of accumulation and peak risks

As parts of China are exposed to wind storm, earthquake and flood perils a robust system of monitoring accumulation exposure will be critical to the long term viability of the facility. Accumulation potential arises from dependencies between individual risks, making reinsurers more exposed to a single loss event. This can be in the form of a concentration of risks e.g. one insurer having a share in several wind farms in the same earthquake exposed region or the same insurer having a concentration of shares in the same large risk e.g. a utility scale wind farm with several lines of cover and reinsurance.

The facility will employ the use of robust reporting tools and modelling systems to monitor and control accumulation and peak risk exposures.

4. Capacity Allocation

Once reinsurers are comfortable with the exposure and the appropriate rate and premium to charge, the next step is to determine the maximum amount of capacity that can be offered during the given period. Reinsurers will need to work within defined capacity limits set by their own reinsurance treaties and any accumulation and peaks risk exposure as described above.

Where certain facility reinsurers are restricted by accumulation or peak risk exposures the facility administrator will have an important role to ensure that additional capacity can be sourced to provide the full limits of cover required.

5. Wording

When the local cedent accepts the price and the terms and conditions offered by the reinsurer, a contract needs to be drawn up between the parties describing the rights and duties of the parties as well as the terms and conditions that accompany it. The facility leaders and administrator will develop a bespoke policy wording in both Chinese and English which will provide a consistent standard of cover.

5.1.3. Domestic Insurers

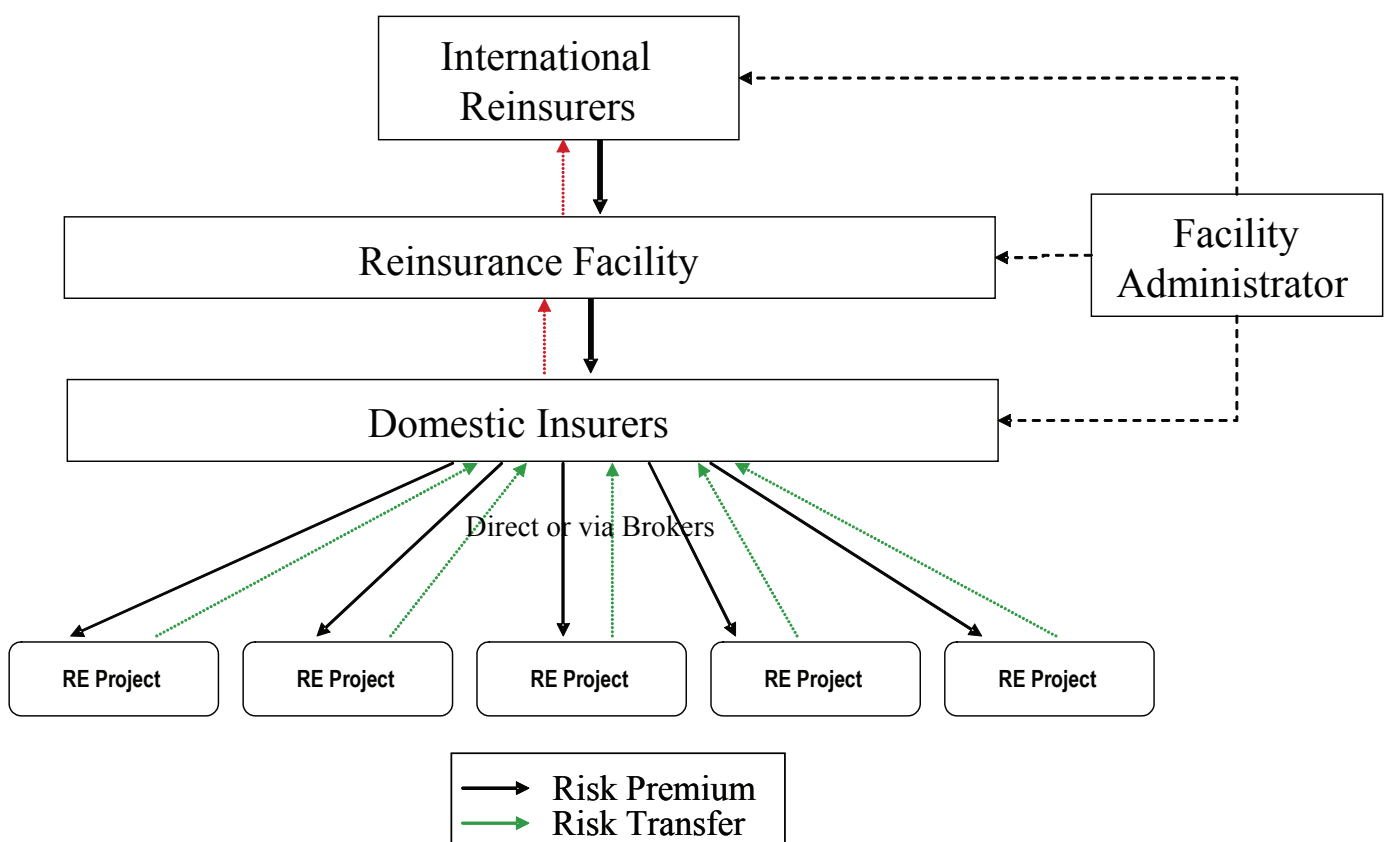
Cedents would require the services of the reinsurance facility in order to offer products or coverage not endorsed or risks which, due to their facultative nature, fall outside their existing treaty reinsurance arrangements. Cedents would work with the facility manager to ensure that full capacity support was behind the insurance offered to their clients.

The cedent would incorporate the services of the facility within their marketing to enhance the products offered and increase visibility to local clients. The cedent would need good understanding of those products and how they could relate to a client’s needs.

Part of the cedent’s role would be to ensure that reliable information was received from the client/broker concerning the situation of each wind project. The cedent would also need to ask pertinent questions to increase the information available to facility reinsurers. Additionally, the cedents would provide the facility manager with any local knowledge that might affect the risk presented to reinsurers.

The cedent would ultimately present terms of coverage and prices to the client and issue local documentation.

A simple illustration of the Facility Structure is provided below:



The tripartite role of each of the facility stakeholders will include:

Reinsurers

- Highly rated security (minimum S&P “A-”)
- Experience and technical underwriting expertise
- Significant capacity for renewable energy projects
- Provision of new products (e.g. Credit Delivery Guarantee)

Domestic Insurers

- Access to large growing book of business
- Access to well established distribution channels
- Awareness raising and marketing of products to renewable energy customers

Facility Manager

- Compliance with legal and regulatory requirements
- Facility design, structure and ongoing management
- Insurance and reinsurance placement services including administering of premium and policy documentation

- Awareness raising and marketing of products to renewable energy customers
- Placement support services (e.g. risk engineering surveys)
- Claims management services

The insurance procurement process should be straightforward as follows:

- Risk information gathering and decision to transfer risk to insurance
- Submission to local insurer presented by broker or agent
- Local insurer decides their retention and issues local policy
- Principal pays premium
- Reinsurance broker or cedent submission to reinsurance facility
- Claims agreement and payment to involve all insuring parties.

5.1.4. Underwriting expertise

Underwriting expertise would be provided by leading reinsurance specialists who understand the different risk and insurance needs of the industry including those of wind farm developers, manufacturers, operating and maintenance providers, owners, contractors and lenders.

A major role of reinsurers will be their ability to utilise their experience in renewable energy to provide expertise to domestic insurers in China. Areas in which reinsurers could help build local capacity:

- Segregating a cedent's portfolio of property risks so that wind risk performance can be measured in isolation.
- Providing guidance as to appropriate selection of risks and the areas of coverage that need most scrutiny – please refer to Section 5.1.2 for greater detail.
- Explanation of new insurance products and their application.
- Support in the claims process.

The focus should be on building up technical knowledge of the key risk areas of wind farms so that they are treated as a distinct part of a property portfolio. The above could be achieved through focussed seminars / training days with key local cedents and facility underwriters and managers.

Key qualities of the reinsurance facility panel of underwriters should include:

- Leader in renewable energy insurance business
- Experience and local presence in the PRC insurance market
- Dedicated renewable energy underwriting team
- Risk assessment and loss control expertise
- Bespoke policy wordings
- Flexibility to underwrite other renewable energy technologies and provide new and emerging products
- Highly rated security (S&P A- rated or above)

5.1.5. Product Offering

Products offered by the facility will need to consist of traditional project insurance coverages as well as new and emerging products that address pioneering technology and new exposures associated with renewable energy.

The coverage needs of each project / cedent may be wide and vary in complexity so flexibility will be critical. Broader coverage would certainly need to be a theme of the facility to aid differentiation with existing domestic products.

The core coverage areas provided under one master policy could include:

- Construction All Risks
- Delay in Start Up
- Cargo (marine and inland transits)
- Operating All Risks
- Machinery Breakdown
- Business Interruption
- Third Party Liabilities (during construction and operating)

Analysis shows that the facility could offer broader coverage than domestic insurance markets which tend to have more exclusions and / or more restrictive forms of cover imposed by reinsurance contracts.

Figure 5.2: Typical Chinese Re-insurance market coverage restrictions / exclusions

	China Market	International Market
Delay in Start Up	Majority exclude	Available
Design Coverage	Limited	Wider cover available
Business Interruption	Limited	Wider cover available
Testing and Commissioning	Limited	Wider cover available
Consequential loss from wear and tear, corrosion etc	Excluded	Available
Strikes Riots and Civil Commotion	Excluded	Available
Legal liability during construction	Limited	Available
Contingent DSU/BI	Excluded	Available
Cover for Prototypical Technology	Limited	Available

A key advantage of the Facility could be its ability to package a number of different classes of business under one master policy. In this way coverage can be provided during construction through to operating. This can be a significant advantage if the handover from construction to operating is performed in stages or, as discussed in Section 3.4.2 where commissioning takes many months to perform. Facility insurers will be able to offer the initial operations cover required to bridge the gap that would exist otherwise.

Facility insurers would also look to create incentives for insureds using other underwriting techniques. No claims bonuses are frequently offered by international insurers to reduce overall premium costs in the absence of claims or in the event of low claims.

Insurers have also offered premium discounts for risk engineering reports. These reports would aim to detail all of the key risk aspects of a project, thus compiling all underwriting information in a format the insurer can easily interpret. The saving in premium achieved is often less than the cost of the report and the report can be used by the project in other areas such as attracting finance. There are a number of engineering firms that can offer this service in China such as Mott MacDonald or Sgurr. Marsh has its own team of trained engineers that can perform this function on behalf of clients.

Facility reinsurers will also be aware, and experienced in complying with, the following list of insurance requirements as stipulated frequently by project financiers:

- Assignment of insurance
- Waiver of insurers rights of subrogation against lenders
- Loss payee provisions
- Lenders named as joint insured
- Notification to Lenders of cancellation/other amendments
- Primary Coverage Clause
- Non-vitiating conditions (whereby non-compliance with policy conditions by other Insureds will not prejudice Lenders rights under the policy)
- Minimum financial ratings for insurers
- For future construction projects Delay in Start-Up for delay in completion arising from loss or damage indemnifiable under the Contract Works policy during the construction phase
- Consolidated cover for all aspects of construction projects
- Notice to, and acknowledgement by, Insurers of Assignment
- Non-cancellable cover for the duration of the construction projects
- Broker’s Letter of Undertaking

Subscribing insurers and insureds could also benefit from additional areas of coverage and new products that become available in the international reinsurance market. Initially the facility could provide these on a standalone basis but, with penetration of these products into the Chinese market, they could also be considered for inclusion into the master policy once economic viability has been established. Additional coverage and new products to be provided through the facility could include the following:

1. Latent defects coverage

Construction All Risks policies contain a limited discovery period concurrent with contractors’ maintenance period. This discovery period follows completion of construction and applies to defects caused by contractors during the construction period. This discovery period is usually limited to a maximum 24 months therefore the facility could offer further protection against latent defects as a separate long-term cover.

As the facility develops experience of the contractors and technology used by wind farm projects in China, provision of defect cover could be brought in to the facility. Participants to the feasibility study did not show demand for this product, however the increased use of new technologies and new contractors for wind farm construction may lead to greater losses from latent defects and increase the relevance of the product.

2. Terrorism

There is low demand for terrorism cover in China; developers, for example, do not see acts of terrorism as a significant risk to wind projects in China. International lenders, however, will require terrorism cover to be purchased. The facility will be able to offer terrorism cover to projects for construction and operating phases of projects.

The facility would work to fully understand the terrorism exposure of projects in China. The objective would be to fulfil lenders' obligations with the minimum of additional premium expenditure and increase the financial viability of this product for customers.

3. Political Risks Insurance

Political risk insurance provides financial protection against discriminatory governmental actions and politically motivated violence. International developers might seek protection against nationalisation of their wind farm assets or contract repudiation, for instance. China can be known for its disparities between governmental and provincial law making it difficult for companies operating in China to understand fully the applicable law.

Generally, political risk insurance for Chinese assets is a popular product. Developers and manufacturers interviewed in the feasibility study rated regulatory and governmental risks highly for their potential negative impact on projects. The facility should develop the ability to cover these perils for international developers and financiers.

4. Carbon Credit Delivery Guarantees

When a carbon emission reduction project achieves official approval under the Clean Development Mechanism (CDM) it has the capacity to generate Certified Emission Reductions (CERs). The funding model for a CDM project will often rely on a forward contract for the sale of the CERs to be generated and this contract will usually be in place prior to commencement of operations. As such the carbon credits are effectively pre-sold at a risk adjusted discount to the buyer on the understanding that risks associated with trading CERs at the point of delivery is removed from the risk register of the deliverer. A number of insurers and reinsurers have developed insurance products which are designed to take various components of the carbon credit delivery risk.

Carbon Credit Delivery Guarantees (CCDG) brought noticeable interest from project developers in the study. CCDG provides the following areas of cover:

- Design and operational risks including delivery of the technology on time / budget and the risk that the

performance will meet expectations

- Financial and credit risks such as ensuring the financial viability of the project delivery organisation and the technology provider
- Performance risks including the potential for natural disasters to inhibit completion of the project and bad weather affecting performance
- Political risks such as the political stability of the host country and changes in local legislation affecting the validity of a project
- Project specific risks such as whether the project will successfully achieve approval under the Clean Development Mechanism such that emission reductions can be verified and Certified Emission Reductions generated, issued and sold.

The CCDG product is clearly a complex one but can provide significant benefits to a project, particularly if that project is aiming to raise international project finance. Few CCDGs have been successfully arranged to date but the facility could help its development by offering the product to Chinese projects.

5. Weather Risk Insurance / Derivatives e.g. lack of wind/sun

Weather risk insurance provides insureds with protection against extremes of weather that adversely affect the revenues of a project. In the case of wind, the insurance would pay out in periods of extremely low wind and hence little or no power generation benchmarked from a settled 'average' level of expected wind. This product has been explored by Marsh and Paris Re as part of a separate UNEP study; the facility could explore the applicability of this product for projects in China. There is likely to be demand for the product however a complaint from developers interviewed in this study was that some wind farms suffered financial losses due to insufficient wind resource data being considered before construction of the wind farm. Extensive wind resource data would need to be available in order for this product to be considered.

6. Manufacturer Warranty Insurance

With new turbine designs being developed continually in China, it is essential that turbine manufacturers are able to provide customers with comprehensive warranties to be competitive. Manufacturers will therefore want to protect their balance sheet by insuring their warranty position.

Heavy losses have been experienced by some manufacturers under their warranties. Defects such as cracked blades or faulty gearboxes lead to expensive retrofitting of turbines and damage to the manufacturer’s reputation. The provision of manufacturer warranty insurance by the facility will therefore need to be supported by strong relationships with insureds. Insurers will need to be assured that the manufacturer’s operations and technology employed meet minimum standards.

5.2. Other Renewable Energy projects and jurisdictions

The facility should have the flexibility to offer insurance capacity to other forms of renewable energy for example solar, biomass, offshore wind, wave/tidal and hydroelectric power. Domestic insurers have shown their willingness to write these areas of renewable energy but, similarly to wind power, cedents will require underwriting expertise for the different technologies. For example, insurance policy wordings will need to be changed to reflect the differing risk profiles of each type of energy generation. A facility with a structure as described above should be more than adequate for the provision of insurance capacity to these technologies.

Further, the facility should explore its ability to provide capacity to projects in jurisdictions other than the PRC. The facility does not have to offer support exclusively to China provided the legal and regulatory pressures from other countries are taken into account. The facility could achieve this in two ways; firstly by developing new relationships with local cedents and principals in other countries or secondly by using Chinese cedents’ existing authority to write risks in surrounding countries. In each case the existing reinsurance panel could be used provided that they have the authority or desire to write projects in the new jurisdiction – the proposed structure of the facility should be transferable to other jurisdictions.

5.3. Pilot Study and next steps

In order to test the operation of a reinsurance facility it would be necessary as a next step to reinsure a live project using a local cedent. This would give the opportunity to test the real operation of the facility and discover any unforeseen challenges before marketing on a larger scale. Above all, it would hope to prove that the facility concept works in reality.

Below are some of the developers that we have spoken to and would recommend be approached as part of a pilot study :-

1. China Guangdong Nuclear Wind Power Company
2. Honiton Energy
3. Evelop International China
4. UPC Renewables China

Marsh and Ascot Renewco are very committed to making the reinsurance facility a reality and are looking to initiate this process by identifying a wind project in China that could be used as a pilot. Ascot Renewco are intending to dedicate resources to providing training and training materials for cedents along with access to the industry experts with whom Ascot consult. Ascot Renewco would be the lead reinsurer of the facility and have a good reputation in the insurance market with which to encourage additional capacity from other insurers.

Marsh UK would perform the role of the facility manager liaising between the Chinese and International insurance markets. Marsh China would eventually perform a slightly separate role from the facility to prevent conflict of interest. Marsh China would facilitate introductions between the UK office and the domestic cedents and initially aid the marketing of the facility product to cedents. However, once a facility was more fully established, Marsh China would focus on the retail insurance and work with developers in identifying projects for insurance. The facility should not be seen as exclusive to Marsh in China and will need to attract business from other broking houses.

The Pilot Study would involve consultation with local cedents to identify a partner able to perform their part in the facility operation. The cedent would need to be able to work closely with the reinsuring panel and to a certain extent be led by them. Ideally the cedant would have a significant portfolio of renewable energy projects that could benefit from the use of the reinsurance facility. From this portfolio a project could be identified as viable for the facility and the Facility Manager would work with the cedent in putting a strong case to the principal for the use of the international markets.

In conjunction with a successful Pilot Study, a marketing exercise would be the key next step. The results of the study would be presented to key cedents and developers as a follow-up to the interviews held.

Our UNEP Facility Manager team would combine key elements of the Marsh team with expertise from our Renewable Energy Practice group based in London and also our team in China/Hong Kong.

Each key member of the Marsh UNEP Facility Manager team has either Chinese and/or international experience in providing risk advisory and insurance placement

services for construction and operating insurance; many team members also have significant expertise on wind farm business.

We propose the following team members that would cover the scope of business development, business advisory, insurance facility management, underwriting, placement and claims:

Proposed Position	Name	Primary Responsibility	Location
Senior Consultants			
Technical Advisor	Jim Maguire	Relationship management and technical advice on major risk issues	Hong Kong
Technical Advisor	Martina Baugh	Co-ordinates global resources throughout the Marsh Group when needs arise	London
Business Advisor	H.Y Liew	Provides strategic advice to the core service team; Do the performance audit to ensure service progress is tracked and quality of service met.	Hong Kong
Business Advisor	Peter Lewis	Reinsurance broking & wholesale placement; Technical advice on major insurance issues	London
Core Service Group			
Key Account Manager	William Wang	Overseeing all aspects of service deliverables;	
Liaison of specialist resources within the servicing team; Insurance/reinsurance broking & placement; Technical advice on insurance issues	Shanghai		
Servicing Manager	Ian Chen	Monitoring and ensuring daily service deliverables and the focus point of contact and operational issues	Beijing
China Placement	Jin DaRong	Insurance/reinsurance broking & placement;	
Technical advice on insurance issues; Supervising insurance maintenance & daily services	Beijing		
China Placement	Vicky Zhao	Technical support, guidance & advice on any issues relating to broking, placement & maintenance of cover if required	Beijing
Risk Control			
Chief Consultant	Yuan Bin	Risk control advisory service in respect of property and casualty risks	Shanghai
Consultant	Christine Wen	Daily administration and coordination in respect of all risk management and loss control matters	Shanghai

Claims Management			
Chief Claims Consultant	Elliot Wang	Supervises & co-ordinates all aspects of insurance claims services;	
Advises client on & negotiates in major claims	Hong Kong		
Claims Consultant	Andy Wan	Monitoring development of & negotiating in insurance claims	Beijing

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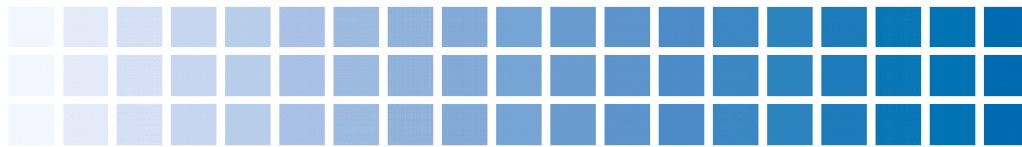


1. Assessment of Financial Risk Management Instruments For Renewable Energy Projects – UNEP Working Group 1 Study Report 2007.
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3. Green Energy In Asia: Renewable Investment, Capacity Growth And Future Outlook, Business Insights, 2007.
4. Wind Power Monthly, Volume 24, No.7, July 2008 – “Paying Proper Respect to Risk in China” and “New policy raises purchase prices”
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Appendix A



MARSH



“RENEWABLE ENERGY INSURANCE FACILITY”

MARSH’S SURVEY ON WIND ENERGY PROJECTS IN CHINA

February 2008

MARSH



MARSH

BACKGROUND & OBJECTIVES

Marsh and Ascot Renewco are conducting a feasibility study for the development of a renewable energy insurance facility for the People’s Republic of China, at the request of the United Nations Environment Programme (UNEP).

A key objective of the feasibility study is find out whether it is possible to provide renewable energy projects with access to better coverage and new products which are better suited to the needs of the industry and that may otherwise not be available in domestic insurance markets. Focusing on wind energy projects, a facility may be used to overcome existing domestic market deficiencies such as:

- Low level of risk awareness and risk transfer benefits of insurance
- Lack of bespoke products for the renewable energy sector
- Inconsistent and fragmented approach procurement process
- Limited technical underwriting expertise
- Regulatory barriers.

Marsh and Ascot Renewco will deliver the feasibility study detailing their recommendations on the facility to UNEP in April 2008. As part of our study, we have developed this questionnaire to help us understand the insurance issues you face with wind energy projects in China.

Our project is expected to be completed by April 2008, and this survey aims to:

- Identify the demand for wind energy projects in China
- Identify the demand for insurance coverage for wind energy risks and the current availability of cover
- Evaluate the merits & demerits of those insurance solutions and/or mechanisms currently used for managing wind project risks, and
- Identify the need, if any, for some solution capable of providing insurance products to the Chinese wind market

This document explains how the attached questionnaire has been prepared, and your role in answering it.

MARSH

Marsh provides risk advice and insurance transaction capabilities to clients through its 26,000 colleagues in over 100 countries worldwide. Marsh has developed a global renewable energy team with an in-depth understanding of this growing industry, dedicated to supporting the needs of their clients.



Ascot Renewco is a dedicated division of insurer Ascot Underwriting for all types of renewable energy. Ascot Renewco’s team of experts partner with their clients and their brokers to define and support their insurance needs. Ascot Underwriting is a proven insurance market leader with top-quality capital backing and, as one of the largest syndicates at Lloyd’s of London, enviable financial strength.



The United Nations Environment Programme is an advocate, educator, catalyst and facilitator, promoting the wise use of the planet’s natural assets for sustainable development. As part of their work, UNEP develop national environmental instruments and encourage new partnerships in the civil and private sectors.

MARSH

QUESTIONNAIRE’S SCOPE & TIMING

We are grateful for your agreement to participate in this project. By involving people from different companies and with different interests in wind projects, we will be able to gain a broad view of insurance products in place, and how these can be improved going forward. In this regard, the objectives of our questionnaire are to:

- Capture your organization’s role in wind energy projects
- Understand the risk-issues your organization currently faces or may face in the future in connection with wind energy projects
- Evaluate the insurance mechanisms and/or solutions currently used by your organization to better manage wind energy projects-related risks
- Identify your organization’s need and interest, if any, for some solution capable of providing an enhanced insurance offering.

We envisage that completing this questionnaire will take you 20 minutes maximum.

PRIOR TO ANSWERING THE QUESTIONNAIRE

It is our aim to make this exercise as simple and quick as possible, with minimum disruption and demand on your time.

In this context, please consider the following questions:

- *What are the risks affecting the wind energy projects your organization is involved in?*
- *How do you deal with these risks?*
- *What would be the merits and/or demerits of an insurance solution used for managing wind energy risks?*
- *What would be the preferred - or required - characteristics of such a solution, including its complexity, availability and pricing?*

We look forward to working with you on this important project and would ask you to cooperate as fully as possible. Should you have any questions, comments and/or concerns regarding this questionnaire, please do not hesitate to contact [NAME OF MARSH REP] on [TELEPHONE], or via E-mail at [E-MAIL ADDRESS].

WHEN ANSWERING THE QUESTIONNAIRE

Please answer all questions using your own judgment / experience. If you do not know how to answer a question, please carry on with the rest of the questionnaire. Once completed, please come back to the unanswered question(s) and try again. Please do not worry if you cannot come up with an answer – since our goal is to collect *perspectives*, there are no “right” or “wrong” answers.

Please note that in agreeing to fill in and return this questionnaire, you are agreeing for the results to be incorporated into our feasibility study report.



QUESTIONNAIRE

1. BACKGROUND TO WIND ENERGY INVOLVEMENT

1.1. What is your organization’s role/involvement in the wind energy market place? (please see examples) Please indicate how long your organization has been involved in this line of business?

- Developer – Chinese domestic
- Developer – International
- Manufacturer – Chinese domestic
- Manufacturer - International
- Financier/Lender – Chinese domestic
- Financier/Lender – International
- Insurer/Reinsurer – Chinese domestic
- Insurer/Reinsurer – International
- Other, please explain: _____

Length of involvement in wind energy: _____

Additional comments: _____

1.2. Approximately how many individual wind energy projects is your organization currently involved in (at any stage in the project)?

- | | |
|---|--|
| <p>In China?</p> <ul style="list-style-type: none"> <input type="checkbox"/> None, but have an interest <input type="checkbox"/> Less than 5 <input type="checkbox"/> Between 5 and 10 inclusively <input type="checkbox"/> Between 10 and 20 inclusively <input type="checkbox"/> More than 20 | <p>Internationally?</p> <ul style="list-style-type: none"> <input type="checkbox"/> None, but have an interest <input type="checkbox"/> Less than 5 <input type="checkbox"/> Between 5 and 10 inclusively <input type="checkbox"/> Between 10 and 20 inclusively <input type="checkbox"/> More than 20 |
|---|--|

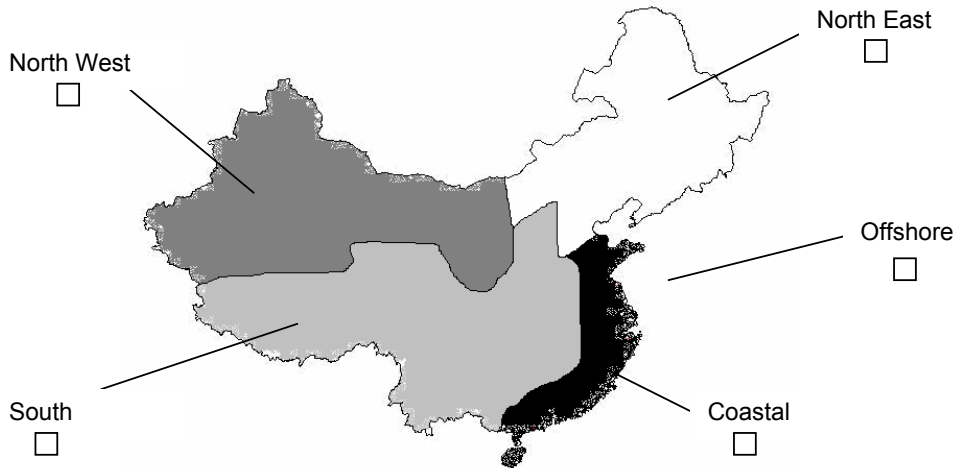
Additional comments: _____

1.3. If you are currently involved in wind energy projects, what is the approximate MW output of the projects you are involved in?

- | | | |
|--|-------------------|--------------------|
| | <u>ONSHORE MW</u> | <u>OFFSHORE MW</u> |
| <input type="checkbox"/> Planned (within the next 5 years) | _____ | _____ |
| <input type="checkbox"/> Currently operating | _____ | _____ |

MARSH

1.4 Please tick all geographic regions in China indicated below, where you have or will have wind energy interests:



1.5 Is your company involved or planning to be involved (in the next 5 years) in projects for any of the following Renewable Energy areas?

- | | |
|--|---|
| <input type="checkbox"/> Wind Power – Onshore | <input type="checkbox"/> Solar Energy |
| <input type="checkbox"/> Wind Power – Offshore | <input type="checkbox"/> Biogas |
| <input type="checkbox"/> Small Hydro Power | <input type="checkbox"/> Biofuels |
| <input type="checkbox"/> Large Hydro Power | <input type="checkbox"/> Wave/Tidal Power |

2. RISK EXPOSURES AND INSURANCE

2.1. Please rank the main sources of risk, in a wind energy project, from the most concerned about to the least concern to your organization? (Please rate on a scale from 1 to 5, with 1 being the biggest concern, and 5 being the least)

Construction/completion risk (e.g. accidents/failures during construction that cause a delay to project completion)	Natural Hazards (e.g. fire, lightning, flood, earthquake, wind storm etc)	Technology/engineering risks (e.g. equipment failure, machinery breakdown)	Resource risk (e.g. variability in wind speed)	Regulatory risk (e.g. inability to obtain required planning/concession agreements from authorities)	Bankability risk (e.g. inability to raise required finance for a project)	Contractor/O&M risk (e.g. failure of contractors/O&M providers/offtakers to perform or meet contractual obligations.)

MARSH

2.2. Is insurance purchased for your wind projects in China?

- YES NO

If Yes, which of the following markets do you purchase insurance from?

- Domestic Chinese insurance markets International insurance markets

2.3. What are the main drivers for purchasing insurance? (Please tick all that apply)

- Part of our risk management philosophy
- Lenders/financiers require it
- Joint venture or other project partners require it
- Local authorities / regulators require it
- Others, please specify _____

2.4. Which statement best describes how you purchase insurance? (Please tick one box only)

- Through a local broker
- Through an international broker
- Direct through an insurance company
- Through an insurance advisor
- Through another intermediary/agent
- Other, please describe _____

2.5. Is insurance purchased:

- on a project by project basis? or as part of a wider insurance portfolio?

2.6. How much do you budget for insurance out of the total project development cost?



2.7. For companies involved in international wind energy projects, would you generally purchase insurance for wind energy projects, not specific to China?

- YES NO

If Yes, what are the most important considerations when deciding on insurance?

- Compliance with lender requirements
- Cost – insurance premium is as low as possible
- Breadth of cover
- Flexibility of insurance product – tailored to project specific needs
- Speed and responsiveness of insurance company
- Security and reputation of insurance company.

Additional comments: _____

2.8. If you do purchase insurance for wind projects in China, please indicate which types of insurance cover you purchase:

Construction:

- Transits (marine & inland)
- Construction All Risks
- Delay In Start Up
- Third Party Liability
- Terrorism

Operating:

- Operating All Risks
- Business Interruption
- Third Party Liability
- Terrorism
- Mechanical Breakdown

Any others (please specify): _____

2.9. Please indicate which types of insurance would you would be interested in purchasing, that you do not already?

Construction:

- Transits (marine & inland)
- Construction All Risks
- Delay In Start Up
- Third Party Liability
- Terrorism

Operating:

- Operating All Risks
- Business Interruption
- Third Party Liability
- Terrorism
- Mechanical Breakdown

Any others (please specify): _____



2.10. Why are these types of insurance not purchased? (Please tick all that apply.)

- The company does not have an insurance-buying philosophy
- The company is willing to take these wind farm risks themselves
- Not aware that this insurance is available for wind farms
- Have not been able to secure insurance – insurers decline to insure
- Insurance is prohibitively expensive
- Cover is not broad enough – there are too many exclusions.

2.11. Would you be interested in the services of an insurance facility to access international insurance markets to provide a more enhanced solution?

- YES NO

MARSH



“RENEWABLE ENERGY INSURANCE FACILITY”

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- Low level of risk awareness and risk transfer benefits of insurance
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- Capture your organization’s role in wind energy projects
- Understand the risk-issues your organization currently faces or may face in the future in connection with wind energy projects
- Evaluate the insurance mechanisms and/or solutions currently offered by your organization to transfer/manage wind energy project-related risks
- Identify your organization’s interest, if any, in participating in a facility capable of providing an enhanced insurance offering.

We envisage that completing this questionnaire will take you 20 minutes maximum.

PRIOR TO ANSWERING THE QUESTIONNAIRE

It is our aim to make this exercise as simple and quick as possible, with minimum disruption and demand on your time.

In this context, please consider the following questions:

- *How involved is your organisation in renewable energy project and more specifically wind energy projects?*
- *What capacity and insurance products do you provide for these risks?*
- *What would be the merits and/or demerits of an insurance facility solution used for managing wind energy risks?*
- *What would be the preferred - or required - characteristics of such a solution, including its complexity, availability and pricing?*

We look forward to working with you on this important project and would ask you to cooperate as fully as possible. Should you have any questions, comments and/or concerns regarding this questionnaire, please do not hesitate to contact [NAME OF MARSH REP] on [TELEPHONE], or via E-mail at [E-MAIL ADDRESS].

WHEN ANSWERING THE QUESTIONNAIRE

Please answer all questions using your own judgment / experience. If you do not know how to answer a question, please carry on with the rest of the questionnaire. Once completed, please come back to the unanswered question(s) and try again. Please do not worry if you cannot come up with an answer – since our goal is to collect *perspectives*, there are no “right” or “wrong” answers.

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- Developer – International
- Manufacturer – Chinese domestic
- Manufacturer - International
- Financier/Lender – Chinese domestic
- Financier/Lender – International
- Insurer/Reinsurer – Chinese domestic
- Insurer/Reinsurer – International
- Other, please explain: _____

Length of involvement in wind energy: _____

Additional comments: _____

1.2. Approximately how many individual wind energy projects is your organization currently involved in (at any stage in the project)?

- | | |
|---|--|
| <p>In China?</p> <ul style="list-style-type: none"> <input type="checkbox"/> None, but have an interest <input type="checkbox"/> Less than 5 <input type="checkbox"/> Between 5 and 10 inclusively <input type="checkbox"/> Between 10 and 20 inclusively <input type="checkbox"/> More than 20 | <p>Internationally?</p> <ul style="list-style-type: none"> <input type="checkbox"/> None, but have an interest <input type="checkbox"/> Less than 5 <input type="checkbox"/> Between 5 and 10 inclusively <input type="checkbox"/> Between 10 and 20 inclusively <input type="checkbox"/> More than 20 |
|---|--|

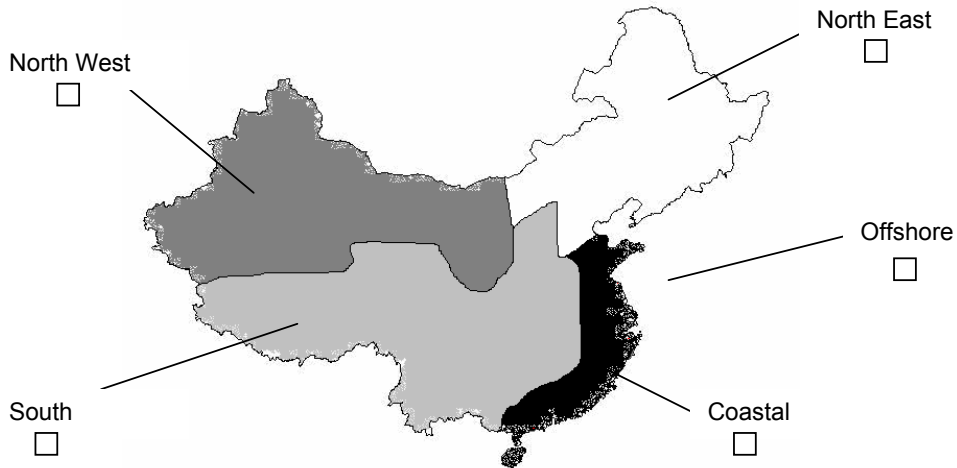
Additional comments: _____

1.3. If you are currently involved in wind energy projects, what is the approximate MW output of the projects you are involved in?

- | | | |
|--|--------------------------|---------------------------|
| | <u>ONSHORE MW</u> | <u>OFFSHORE MW</u> |
| <input type="checkbox"/> Planned (within the next 5 years) | _____ | _____ |
| <input type="checkbox"/> Currently operating | _____ | _____ |

MARSH

1.4 Please tick all geographic regions in China indicated below, where you have or will have wind energy interests:



1.5 Is your company involved or planning to be involved (in the next 5 years) in projects for any of the following Renewable Energy areas?

- | | |
|--|---|
| <input type="checkbox"/> Wind Power – Onshore | <input type="checkbox"/> Solar Energy |
| <input type="checkbox"/> Wind Power – Offshore | <input type="checkbox"/> Biogas |
| <input type="checkbox"/> Small Hydro Power | <input type="checkbox"/> Biofuels |
| <input type="checkbox"/> Large Hydro Power | <input type="checkbox"/> Wave/Tidal Power |



2. RISK EXPOSURES AND INSURANCE

2.1. Do you provide insurance/reinsurance products for wind projects in China?

- YES NO

If Yes, which of the following insurance products do you provide to these wind projects?

Construction:

- Transits (marine & inland)
- Construction All Risks
- Delay In Start Up
- Third Party Liability
- Terrorism

Operating:

- Operating All Risks
- Business Interruption
- Third Party Liability
- Terrorism
- Mechanical Breakdown

Any others (please specify): _____

If No, why do you not provide insurance/reinsurance products for these wind projects?

- Lack of relevant technical expertise
- Lack of available reinsurance
- Lack of demand from the project
- Unable to price the risk competitively
- Too many other markets compete in this space
- Regulatory / legislative restrictions (please specify below)
- (For international (re)insurers) - Lack of Chinese domestic insurer contacts
- (For international (re)insurers) – Domestic insurance market adequate for client needs

Additional comments: _____

2.2. What is your current capacity for wind farm risks?

Please specify: US\$ _____

MARSH

2.3. Would you be interested in participating in an (re)insurance facility to provide a more enhanced solution for wind farm projects in China as a domestic/international insurer?

YES NO

2.4. What do you see as the main barriers to setting up and operating such an insurance facility?

- Lack of demand for insurance from the project
- Regulatory / legislative restrictions
- Existing treaty reinsurance of domestic insurers
- Lack of available technical information from the project / language barriers
- Adequate existing insurance provision from domestic markets

Others (please specify): _____

2.5. Do you think the operation of such a (re)insurance facility is feasible?

YES NO

Why? _____

Appendix B



List of Participants to Study

For UNEP and sponsoring parties only.

The following companies were approached for participation in this feasibility study and have our thanks:

- China Guangdong Nuclear Wind Power
- Evelop
- HKE International
- Honiton Energy
- SempCorp Investment
- SkyPower
- UPC Renewables
- GE Wind
- Airtricity
- NCAT
- Nordex China
- Suzlon China
- Wuhan GC Nordic
- Vestas China
- Beijing Longyuan Zhengye Construction
- Mott McDonald
- Gamesa
- Ascot Renewco
- RSA China
- AllTrust
- Bank Of China
- CPIC
- Huatai
- PICC
- Ping An
- Sunshine

The following people have our thanks for performing the study and contributing to this report:

- Peter Lewis (Marsh UK)
- Martina Baugh (Marsh UK)
- HanYoung Liew (Marsh China)
- James Maguire (Marsh China)
- Warren Diogo (Ascot Renewco)
- Lee Vanderson (Ascot Renewco)

About UNEP

The United Nations Environment Programme (UNEP) is the voice for the environment in the United Nations system. It is an advocate, educator, catalyst and facilitator, promoting the wise use of the planet’s natural assets for sustainable development. UNEP’s mission is “to provide leadership and encourage

partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.”

UNEP does this by

- Promoting international cooperation in the field of the environment and recommending appropriate policies.
- Monitoring the status of the global environment and gathering and disseminating environmental information.
- Catalyzing environmental awareness and action to address major environmental threats among governments, the private sector and civil society.
- Facilitating the coordination of UN activities on matters concerned with the environment, and ensuring, through cooperation, liaison and participation, that their activities take environmental considerations into account.
- Developing regional programmes for environmental sustainability.
- Helping, upon request, environment ministries and other environmental authorities, in particular in developing countries and countries with economies in transition, to formulate and implement environmental policies.
- Providing country-level environmental capacity building and technology support.
- Helping to develop international environmental law, and providing expert advice on the development and use of environmental concepts and instruments.

About Marsh

Marsh provides advice and transactional capabilities to clients through our 26,000 colleagues in over 100 countries worldwide. is a unit of MMC (Marsh & McLennan Companies), a global professional services firm providing advice and solutions in the areas of risk, strategy and human capital. It is the parent company of a number of the world’s leading risk experts and specialty consultants, including Guy Carpenter, the risk and reinsurance specialist; Kroll, the risk consulting firm; Mercer, the provider of HR and related financial advice and services; and Oliver Wyman, the management consultancy.

About Ascot Renewco

Ascot Renewco is a dedicated division of insurer Ascot Underwriting for all types of renewable energy. Understanding the unique challenges faced by the varied technologies across this spectrum, Ascot Renewco's team of experts partner with their clients and their brokers to define and support their insurance needs.

Ascot Underwriting is a proven insurance market leader with top-quality capital backing and, as one of the largest syndicates at Lloyd's of London, enviable financial strength. With underwriting talent and a flexibility of approach that are second to none, they have a history of providing cutting edge solutions for their customers. They have created Ascot Renewco to provide the same support for their clients and their brokers in the renewable energy sector.

MARSH



MARSH MERCER KROLL
GUY CARPENTER OLIVER WYMAN

For more information please contact your local Energy office:

energypractice@marsh.com

or visit us online at:

<http://www.marsh.com>

The information contained herein is based on sources we believe reliable and should be understood to be general risk management and insurance information only. The information is not intended to be taken as advice with respect to any individual situation and cannot be relied upon as such. Insureds should consult their insurance and legal advisors with respect to individual coverage issues.

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