

Global Wind Services Market

Wind energy comes of age



Contents

Introduction	3
Executive Summary	4
Part 1: Global wind services – market size, market growth and competitive structure	8
Part 2: Global wind services – Key Supplier Criteria & Business Models	12
Part 3: Decision making and technology trends	18
Outlook: What do service companies need to do to succeed?	20
Research design and methodology	21
Contacts	22
Taylor Wessing Offices	23



Introduction

Wind energy has arrived as a leading global source of power generation. A total of \$94.4 billion was invested in new generation capacity in 2016 – more than total investment in both gas and coal combined. Non-hydro renewables¹ accounted for 56.6% of all new investment in 2016, and by the end of the decade it is forecast to reach 64.2%. The market has also globalised; in 2016 China overtook Europe as the world's largest regional wind market with 168 GW² installed; India's much smaller market is forecast to double in size between 2015 and 2020 to 49 GW, having been close to zero in 2010. The majority of global wind investment remains focused on onshore sites, but there is strong potential for offshore growth in Europe, particularly Germany, the UK and the Nordic region. Investment in new wind capacity is coming from a wide range of market participants. Utilities that had previously minimised their exposure to wind are now developing onshore and offshore farms. IPPs³ continue to proliferate and established players are continually assessing market opportunities in new geographies. Most intriguingly, Fortune 500 companies and leading players of other financial indices are increasingly investing in wind farms, both to satisfy their own demand and to burnish their green credentials, but also to act as energy suppliers and traders.

All of this translates into strong growth for the global wind services market, which is forecast to increase from \$9 billion in 2016 to be worth \$25 billion by 2025. More wind turbines mean more service revenues, but the age of the installed base is also key; revenues from existing turbines will be driven higher as wind farm operators repower existing assets, increasing the potential output from the wind farm by installing ever larger blades and increasing the intelligence of wind farms with new IoT⁴ related technology – the digital wind farm is already becoming a reality. The growth in offshore wind farms will also drive revenue growth as service costs per turbine are much higher, but onshore service revenues will account for more than 90% of annual revenues across the forecast period.

Taylor Wessing together with Frost & Sullivan undertook an expert survey with 175 global wind farm operators between January and March 2017 to understand the latest trends shaping developments in the sector. In addition, Frost & Sullivan conducted primary interviews with 40 wind OEMs⁵ to gather their perspective on the market's evolution. This summary highlights the key findings of our research and where the opportunities and challenges are for wind farm equipment manufacturers, investors, and operators.

Hamburg, 01 November 2017



Carsten Bartholl,
Partner, Taylor Wessing



Sven Thiede
Director Energy & Environment, Frost & Sullivan

¹ Non-hydro renewables includes wind, solar PV, concentrated solar, biomass, geothermal

² Gigawatt

³ Independent Power Producers

⁴ Internet of Things

⁵ Original Equipment Manufacturers

Executive Summary



As the level of competition increased in the wind equipment market, manufacturers have sought to expand their service offerings to try and offset decreasing equipment margins. That competition has now spread to the onshore wind services market, as new entrants have been attracted by high margins in a flourishing market. Following the trajectory of the thermal power business, this has seen the increasing prominence of ISPs⁶ in the European market in particular, as skilled personal with strong local connections establish their own commercial operations. It has also seen wind OEMs starting to issue service offerings for rival equipment. It has also encouraged wind farm operators to assess what service activities can be conducted in-house to minimise costs. The future will see more of the same, with wind OEMs and ISPs reverse engineering technologies to be able to offer a multi-brand service offering, while large wind farm operators increasingly bring more service elements in-house, signing contracts with components suppliers as opposed to wind OEMs. These market conditions mean that savvy wind farm investors can exploit this competition and look to secure more attractive propositions for service companies.

Remote monitoring and availability guarantees are established practices in the market, having become largely standardised offerings as wind farm operators' sign up for contracts that guarantee performance outcomes. Recent developments show that guaranteed performances are also agreed for periods after 15 years of operation. Service offerings that enable wind farm operators to monetise the data collected, either to improve operational performance or to establish additional revenue streams, will become increasingly attractive, if not necessary, in order to follow up with digitalisation in the energy market. The push by wind OEMs for more LTSAs⁷, which are particularly in demand in Germany, Scandinavia and parts of the UK, will remain a key feature of the market, but wind farm operators are increasingly aware of what they can demand and know that the competition for contracts is intense. It is also likely that we will see examples of wind farm operators making multi-farm commercial tenders for services centrally in order to try and secure more attractive deals.

⁶ Independent Service Providers

⁷ Long Term Service Agreement

Global wind turbine O&M services – a supplier and end-user perspective

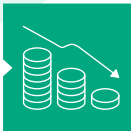


\$25 billion
annual revenues from O&M services for wind turbines to increase from \$9 billion in 2016 to \$25 billion in 2025

Key objectives

gain in-depth understanding on wind power services

Pressure on capex and opex will continue to build as the use of competitive bidding in the industry grows, particularly in Europe.



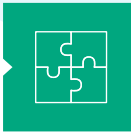
Service offerings that enable wind farm operators to monetise the data collected, either to improve operational performance or for additional revenue streams, will be particularly attractive.



Collaboration is the watchword for the industry; wind farm operators are keen to be more actively involved in wind services.



Significant recent M&A activity is driving consolidation in the market as wind OEMs look to exploit economies of scale and drive operational efficiency.



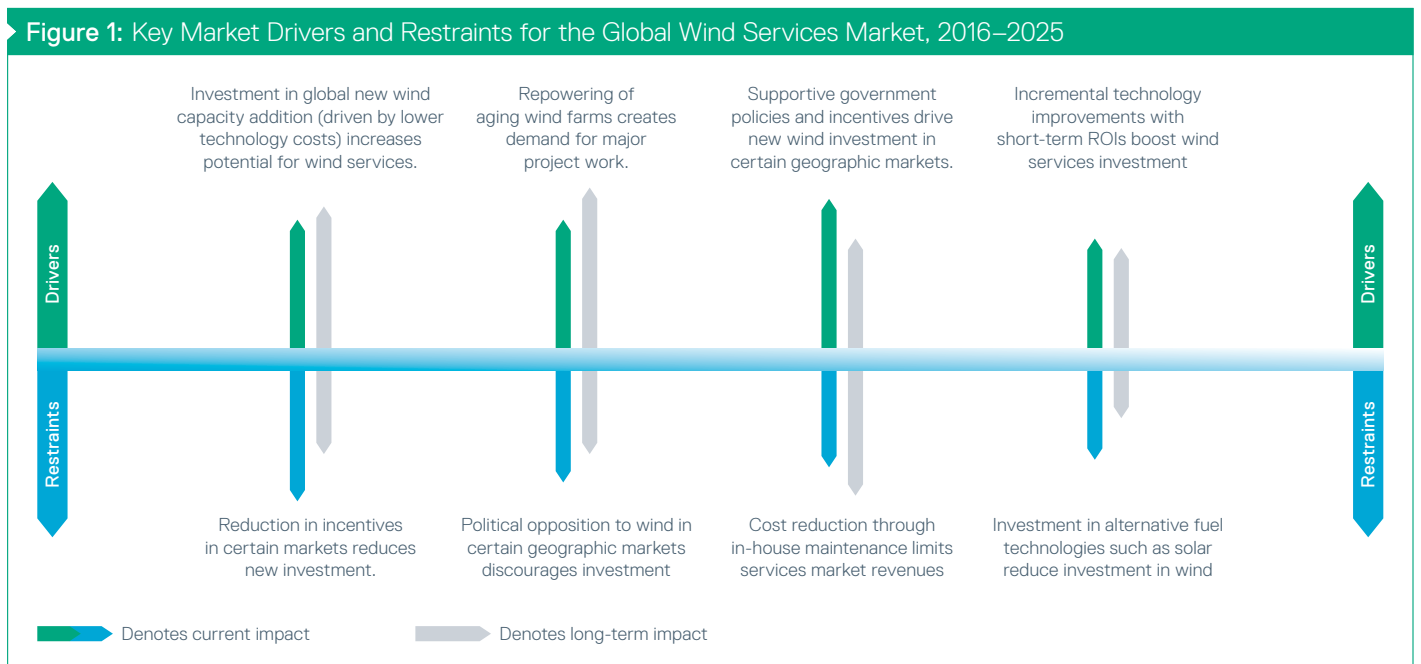
65%
Service will play a more important role than the hardware of the turbine in our future purchasing decision.

52%
In the next 2 to 3 years we will use more independent service providers for servicing the turbines.

54%
In future we will procure a multi-brand service offering.



The figure below shows the key factors driving and restraining the global wind services market.



Source: Frost & Sullivan analysis

The following 10 key findings summarise the main outcomes of our study.

- ▶ **Finding 1** // Consistently high investment in new wind farms, combined with an aging installed base in Europe and North America, will see the services market grow from \$9 billion in 2016 to \$25 billion in 2025.
- ▶ **Finding 2** // Globalisation of the wind service market with the highest growth rates to be found in Brazil, India, Mexico and Turkey.
- ▶ **Finding 3** // Competition in the market continues to increase; M&A activity will continue as wind OEMs are acquiring ISPs and component suppliers to try and defend their market shares and capture more of the total project value.
- ▶ **Finding 4** // Ultimately a more collaborative maintenance approach is required as wind farm operators embrace a service model that requires them to become increasingly involved in the servicing of wind turbines.
- ▶ **Finding 5** // A multi-brand strategy will be increasingly important in this market to compete effectively – and can be beneficial for operators.
- ▶ **Finding 6** // Loyalty – to a point. Only 18% consider themselves likely to switch suppliers, but a further 29% are undecided and could easily be swayed by a better offering, meaning at least 47% of the market is in play.
- ▶ **Finding 7** // A combination of price, response time, and performance are the key customer requirements.
- ▶ **Finding 8** // Service offering is now more important than hardware.
- ▶ **Finding 9** // Technology and digital innovation in services is a key factor in future revenues.
- ▶ **Finding 10** // Decision making is relatively centralised, with decisions either taken at headquarters or at the site following company policy.

Part 1: Global wind services – market size, market growth and competitive structure

Finding 1 // Consistently high investment in new wind farms, combined with an aging installed base in Europe and North America, will see the services market grow from \$9 billion in 2016 to \$25 billion in 2025.

Investment in China over the past 5 years makes Asia Pacific the largest regional services market, worth \$3.65 billion in 2016.

As of the end of 2016, the total installed capacity of wind stood at 487 GW after a decade of consistently strong growth. Servicing this installed base, combined with new installations (total annual investment in wind energy installed capacity is forecast to average \$100 billion a year to 2025) will translate into significant growth in wind services revenues, with the market value reaching \$25 billion in 2025, up from \$9 billion in 2016. Whilst scheduled repair and maintenance will continue to account for the majority of revenues, an increasingly significant amount will come from total overhaul of wind turbines (repowering). The wind market, particularly in Europe, enjoyed exceptionally high growth rates prior to 2010. This capacity will reach an age during the forecast period where repowering is a viable and attractive prospect for many wind farm operators. Continued technology innovation means that the size and ultimately the operational efficiency of turbines is constantly increasing. Higher operational efficiency translates to higher levels of electricity generation and increased profitability, creating a rock solid business case for investment with an attractive ROI.

The sheer scale of investment in China over the past 5 years makes Asia Pacific the largest regional services market, worth \$3.65 billion in 2016, just ahead of Europe. However, effectively penetrating China, which is forecast to account for more than 80% of Asia Pacific revenues throughout the forecast period, remains a challenge for global players, since there is strong support for the use of local contractors.

The European market (EU-28) is forecast to increase from \$3.1 billion in 2016 to \$7.2 billion in 2025, a compound annual growth rate of 9.7%. This is despite the continued cost pressure on wind service contracts. Germany remains the largest and most important market, forecast to be worth \$2.4 billion in 2025 with doubts, however, caused by political developments and recent results of the wind energy auctions expected to further slow down the pace of adding newly installed capacity in 2019 and 2020. Although the rate of new installations in Germany is forecast to be lower, repowering may still help to drive long-term growth. The highest individual country growth rate in Europe currently exhibits France, which is forecast to increase by 13.2% per year to be worth \$706 million in 2025, as the country gradually diversifies its fuel mix minimising its dependency on nuclear power.

The annual growth rate in North America is forecast to be identical to that of Europe at 9.7%, with the market increasing from \$1.7 billion in 2016 to \$4.3 billion in 2025. The pace of growth in North America is forecast to decline with the ending of the production tax credit in 2020 in the United States, but like Europe, North America will benefit from repowering projects carried out on the installed base.

Latin America is a relatively small regional market, worth just \$246.2 million in 2016, only slightly higher than that of the UK, but is forecast to increase by 17% per annum to be worth \$1.2 billion in 2025. A decade ago it appeared that investment in fossil fuels and nuclear energy would be made to compliment the high installed capacity of hydro-power, but much of that investment has gone into solar, wind, and bio-energy projects.

The annual growth rate in North America is forecast to be identical to that of Europe at 9.7%.

Figure 2: Regional Revenue Forecasts, 2016 - 2025



Source: Frost & Sullivan analysis

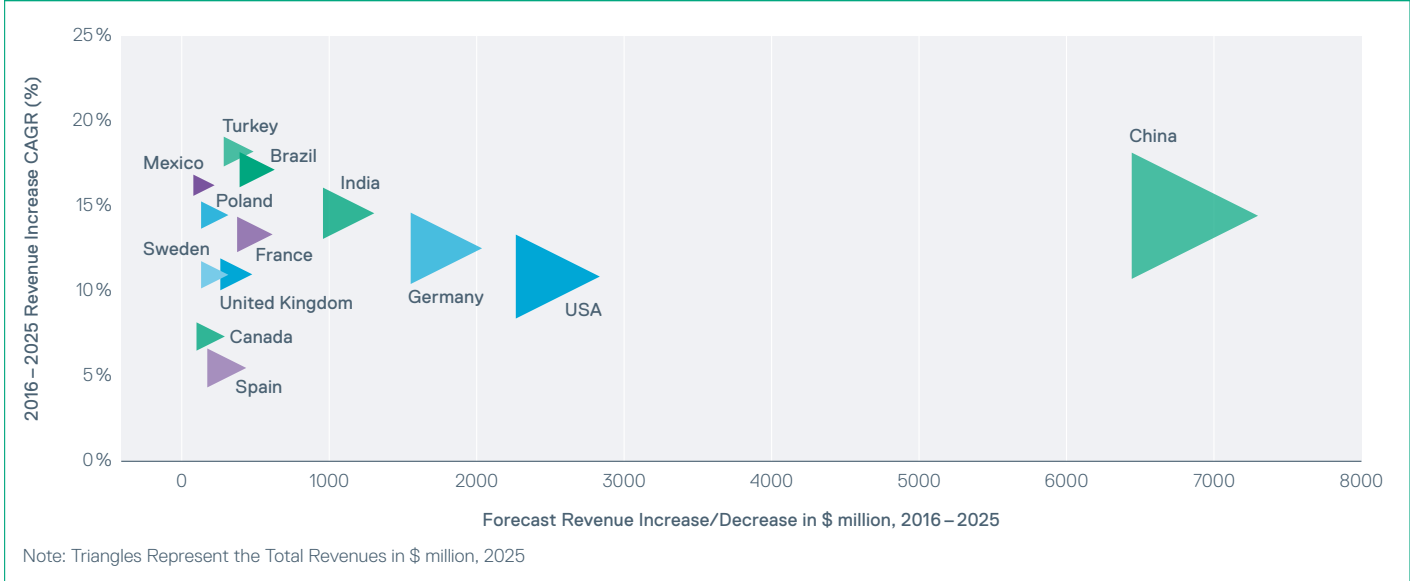
Finding 2 // Globalisation of the wind service market with the highest growth rates to be found in Brazil, India, Mexico and Turkey.

Europe, North America and China will continue to dominate the services market up to 2025, but the market is truly globalising.

Europe, North America and China will continue to dominate the services market up to 2025, but the market is truly globalising, with the highest growth rates found in emerging wind markets. Turkey, which implemented market reforms that boosted renewable energy, will see service revenues to increase by 18% per year to reach \$501.4 million by 2025. Brazil's economy has been struggling in recent years, but wind investment has been strong and revenues are forecast to increase by 16.9% per year up to \$666.2 million by 2025, as Brazil aims to diversify its fuel

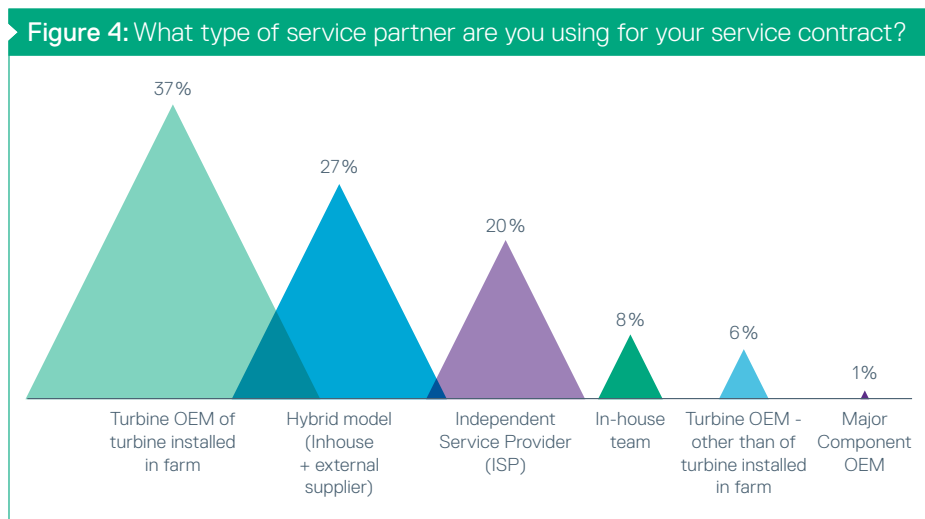
mix away from hydropower. Mexico's liberalisation of its energy market to try and introduce greater competition has attracted wind farm developers to the country and will drive long-term growth in service revenues, which are projected to reach \$190.9 million by 2025, growing by 16% compound annual growth rate. Finally, India, already the second largest market in Asia, will see revenues to increase from \$475.0 million in 2016 to \$1.6 billion in 2025, as the country continues to invest to boost renewables as a share of total power generation.

Figure 3: Wind Services Revenues and Annual Growth Rate, 2016 - 2025



Note: All figures are rounded. The base year is 2016. Source: Frost & Sullivan

Finding 3 // Competition in the market continues to increase; M&A activity will continue as wind OEMs are acquiring ISPs and component suppliers to try and defend market share and capture more of the total project value.



Source: Frost & Sullivan

Wind OEMs are signing long-term service agreements with wind farm operators to try and protect their market shares.

Competition in the market is increasing, but the wind OEMs continue to play a leading role in the market, with Vestas, Siemens (independent of Gamesa) and GE occupying the leading three positions in the services market. The survey results revealed that 37% of respondents with turbines out of warranty were using the original OEM for servicing, while independent service providers accounted for 20% of the market, although the true number is higher, as many are involved in hybrid projects with wind farm operators. The distinction between these two is becoming blurred by the rear guard acquisition of ISPs by the wind OEMs, which are then operated autonomously.

On the subject of ISPs, the survey shows a divergence between individual preferences and expectations for the total market – only 16% said they would prefer to use an ISP in the future (although 22% had no preference), whereas 52% expected ISPs to play a stronger role in the market in the next two to three years.

Wind OEMs are also acquiring component suppliers as they seek to have more control over their supply chains and also capture more of the revenue from spare parts, which traditionally account for around 65% of service revenues. Examples include GE's acquisition of LM Wind Power, a rotor blade supplier, and Nordex's acquisition of SSP Technology, a rotor blade mould supplier.

Wind OEMs are signing long-term service agreements with wind farm operators to try and protect their market shares. This is also an attractive proposition for long-term investors who want to minimise volatility and are particularly popular in Germany, Scandinavia and parts of the UK. However, larger wind farm operators generally prefer contracts of 3-5 years that they can then competitively tender again in the future – this situation is more common in southern Europe.

Part 2: Global Wind Services – Key Supplier Criteria & Business Models

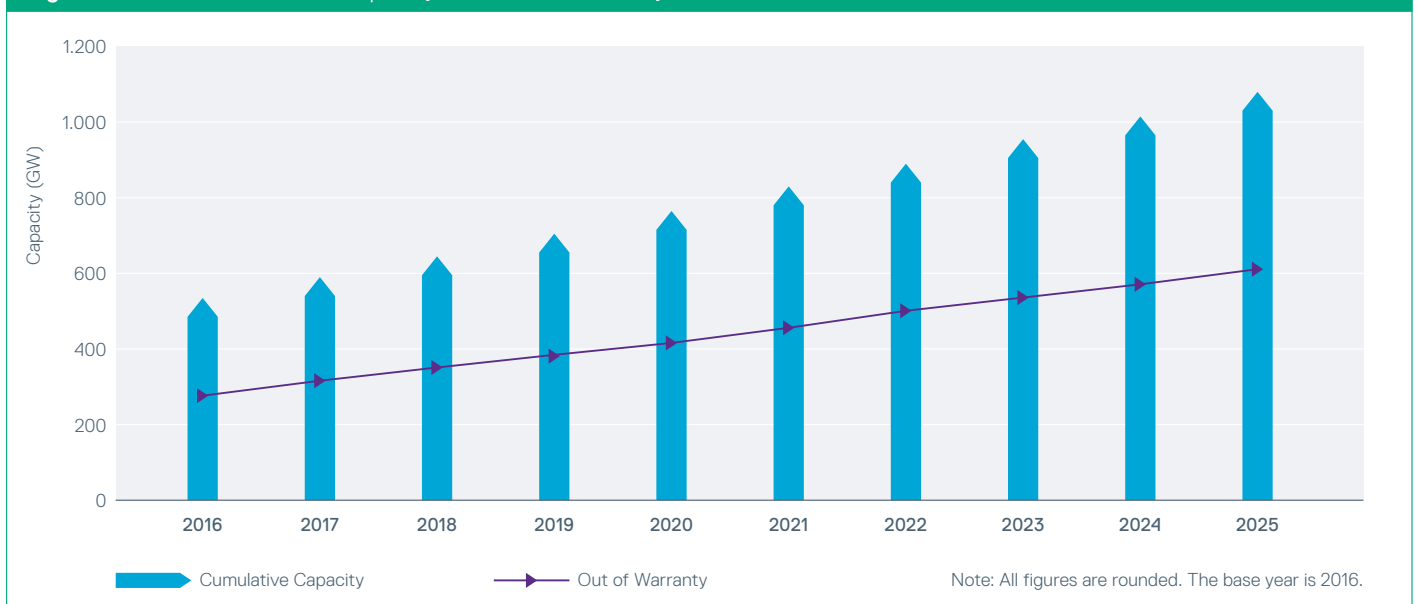
Finding 4 // Ultimately a more collaborative maintenance approach is required as wind farm operators embrace a service model that requires them to become increasingly involved in the servicing of wind turbines.

In 2016, 280 GW of wind capacity was outside of the warranty period; this will have reached 620 GW by 2025.

A clear trend can also be seen in wind farm operators increasingly looking to do more servicing work in-house. Whilst relying solely on such in-house service is possible, only 8% in the survey were doing it. The preferred option remains a collaborative service model, with the wind farm operator doing a lot of the routine servicing activity and relying on a partner for work on specialised equipment such as gearboxes.

In the survey 27% were using this model and this is likely to increase in the future. Major wind farm operators are reaching a situation where the size of the asset base they have outside of warranty makes investing in in-house capabilities viable and attractive. In 2016, 280 GW of wind capacity was outside of the warranty period; this will have reached 620 GW by 2025.

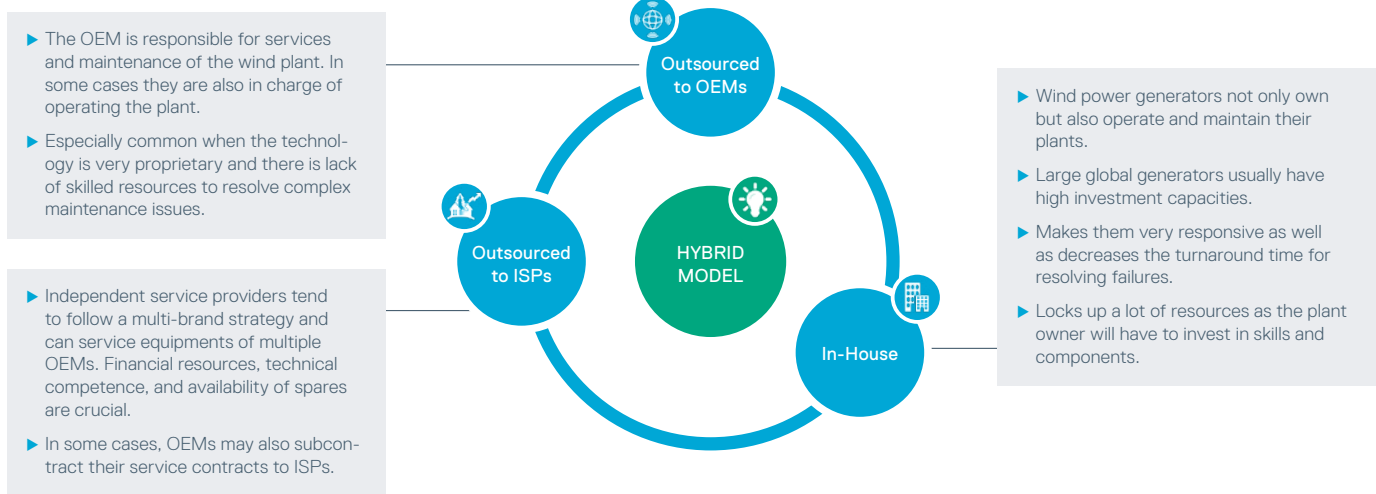
Figure 5: Global Cumulative Capacity Vs. Out of Warranty Market, 2016 – 2025



Source: Frost & Sullivan

Figure 6: Wind Services Business Models

Availability of skilled resources and accessibility (e.g., geography, onshore, offshore), the size of the wind farm, and the policy and regulatory environment also play a critical role in the decision criteria for selecting a business model.



Source: Frost & Sullivan analysis

Figure 7: Wind Services Delivery Models

Business Models	Outsourced to OEMs	Outsourced to ISPs	In-House
Brief Description	Equipment manufacturers may sign LTSAs or enter into service agreements with wind plant owners at the time of project development.	Independent Service providers can provide service capability especially after the equipments come to the end of their warranty period.	End customers may decide to service their wind power plants in-house and develop skills for better cost control.
Pros	<ul style="list-style-type: none"> ▶ Technology owner ▶ Skilled to service own equipment ▶ Additional revenue opportunity for OEMs ▶ Quick turnaround 	<ul style="list-style-type: none"> ▶ Multi-brand capabilities ▶ Sub-contractual agreement ▶ Competitive pricing ▶ Accessibility in regional markets ▶ Core business area 	<ul style="list-style-type: none"> ▶ Greater autonomy ▶ Reduction in turnaround times ▶ Cost reduction and control ▶ Sub-contracting option available
Cons	<ul style="list-style-type: none"> ▶ Not the core business area ▶ Need to invest in high caliber skills ▶ Higher cost to customers ▶ Might need to subcontract for their multi-brand strategy 	<ul style="list-style-type: none"> ▶ May lack skills to service technologically advanced equipments ▶ Low margins due to high competition ▶ Disadvantages of a symbiotic tie-up with OEMs 	<ul style="list-style-type: none"> ▶ Invest in skills and spares ▶ May lack capability to service technologically advanced equipments ▶ Difficult to provide O&M services for multi-brand equipments

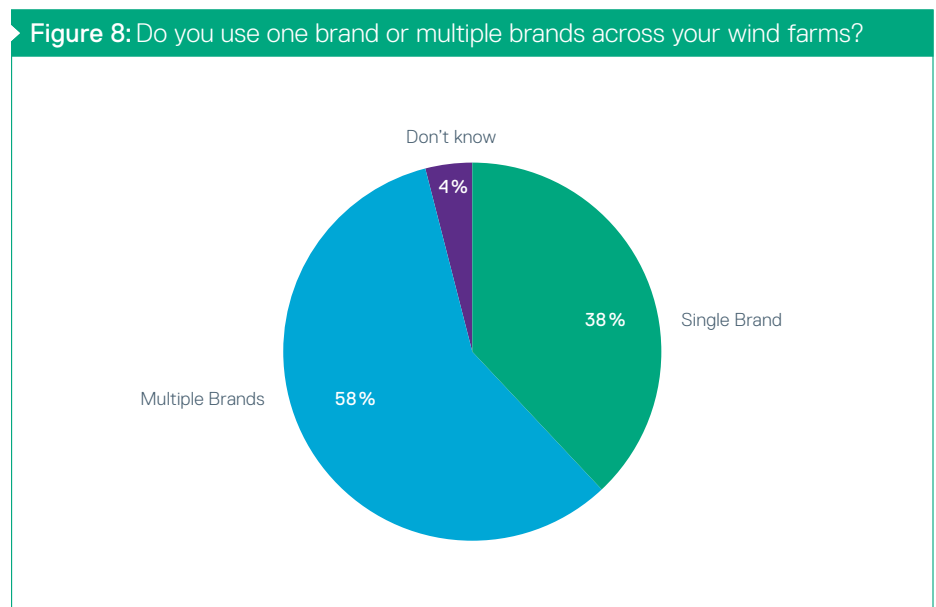
Source: Frost & Sullivan analysis

Finding 5 // A multi-brand strategy will be increasingly important in this market to compete effectively – and can be beneficial for operators.

65% of wind farm operators (78% in Europe) stated that in the next 2-3 years they would seek for a multi-brand service model.

The vast majority of wind farm operators are continuing to invest in new farms in existing markets and are also expanding their geographical footprint. Relatively few are loyal to one or even two turbine OEMs, instead preferring a fully competitive commercial process which can result in a number of different brands being used across different wind farms. In the survey 58% of wind farm operators used multiple brands and this number was significantly higher when the smallest wind farms are excluded. This does not necessarily

translate into wind farm operators wanting to rely on a large number of service partners; in the survey 65% of wind farm operators (78% in Europe) stated that in the next 2-3 years they would seek for a multi-brand service model. This makes a multi-brand offering a key strategic imperative for the wind service industry to adopt, and is a factor driving the trend to acquire ISPs discussed earlier in the summary, possibly even as an alternative for OEMs.



Source: Frost & Sullivan analysis

Finding 6 // Loyalty – to a point. Only 18% consider themselves likely to switch suppliers, but a further 29% are undecided and could easily be swayed by a better offering, meaning 47% of the market is in play.

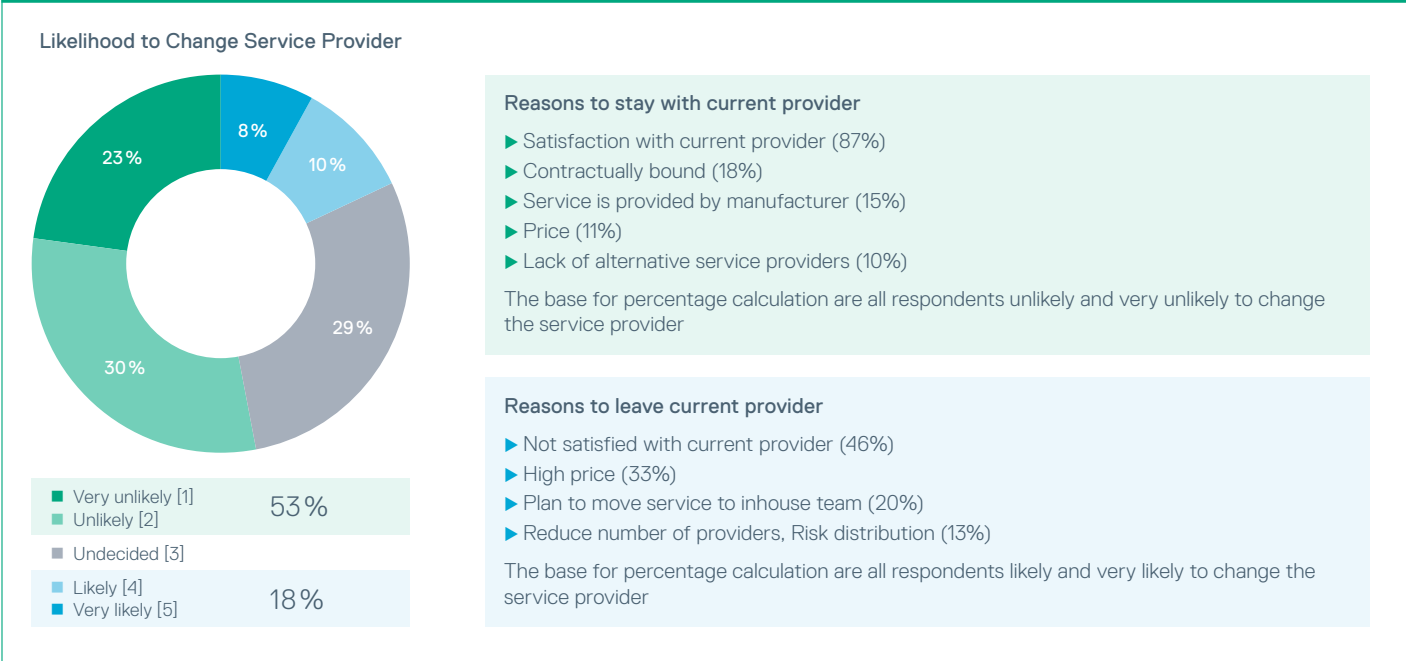
The survey reveals that only 18% consider themselves likely to switch suppliers, the major reasons being dissatisfaction with their current provider, price, and plans to move more service to an in-house team. However 29% expressed no clear preference, suggesting a low level of loyalty and openness to competitor service propositions. Of the 53% that said they were unlikely to switch, satisfaction was the main reason, but 18% cited being contractually

bound and 10% highlighted a lack of alternative service providers, suggesting that a minority of this 53% may move if the right offer is made to them.

This is another sign that participants should not become complacent. Average service on one long-term contract could see a provider lose out on other opportunities, particularly as most investors continue to expand their wind park footprint.

Average service on one long-term contract could see a provider lose out on other opportunities, particularly as most investors continue to expand their wind park footprint.

Figure 9: How likely are to change any of your operation and maintenance service providers in the next 5 years? If you are changing or staying, what is the reason?



Source: Frost & Sullivan analysis

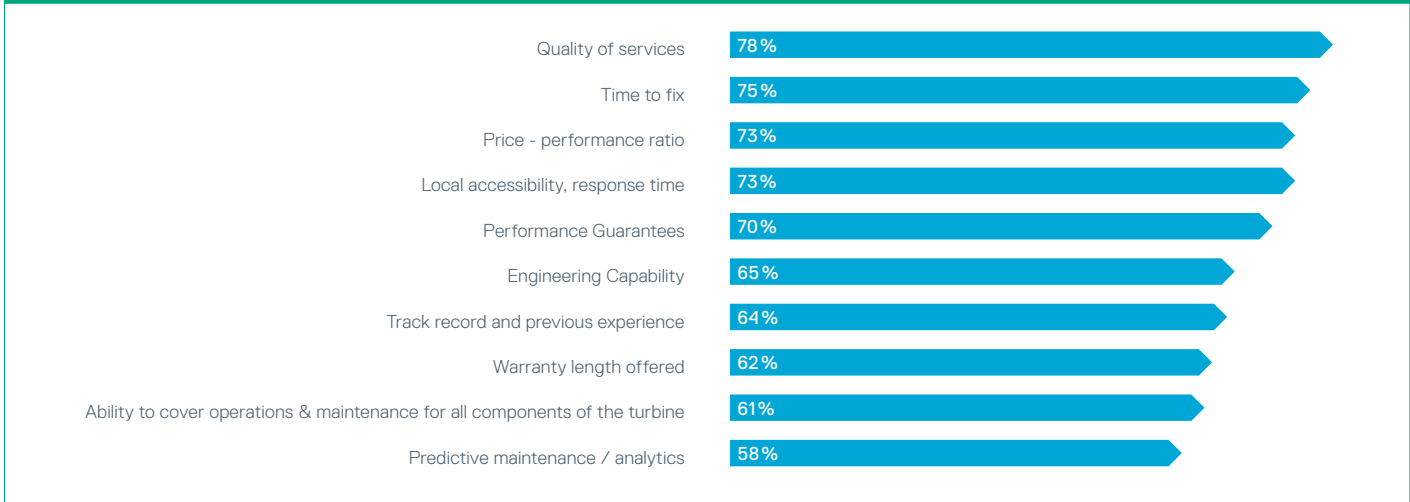
Finding 7 // A combination of price, response time, and performance are the key customer requirements.

Time to fix is likely to decrease in importance in the future, as performance guarantees become more and more widespread.

The survey revealed that quality of service (78%), time to fix (75%) and price - performance ratio (73%) are the highest rated purchase criteria from wind farms when asked to rate those that are crucial or very important. Time to fix is likely to decrease in importance in the future, as performance guarantees become more and more widespread – 69% of respondents in the survey stated this is a key

contractual requirement (regularly also a bank financing requirement) and this number reached 76% in North America. Reflecting the challenge to the dominance of wind OEMs, the service provider being the original OEM was one of the lowest scoring criteria, with only 42% highlighting this as being crucial or very important; this fell to 39% in Europe and just 28% in North America.

Figure 10: When making a decision for your wind turbine operation and maintenance service provider, how important are the following factors in your purchase decision?



Source: Frost & Sullivan analysis

Finding 8 // Service offering is now more important than hardware.

The results of the survey indicate that service is expected to play an increasingly important role in the decision on which turbine manufacturer to select for a contract. A total of 65% of respondents agreed with the statement “service will play a more important role than the hardware of the turbine in our future purchasing decision”. Wind farm

operators still place close attention to capital costs, which are becoming particularly important in a European market that has largely moved away from a feed-in tariff model and is now focusing on competitive bids. But wind farm operators also take account of total lifecycle costs, as operational efficiency remains important.

Service is expected to play an increasingly important role in the decision on which turbine manufacturer to select for a contract.



Offshore Insights

Strong growth is forecast for the offshore market, with 4.4 GW of annual capacity installed between 2017 and 2025. Europe is the key market accounting for approximately 70% of annual installations. Technology costs remain high, but competitive bidding is bringing significant per MWhr price reductions. The strong growth in offshore is felt in the wind services revenue forecast, with revenues forecast to reach \$1.3 billion by 2025.

From a service perspective, the offshore market has particular needs, with per turbine service costs that can be 2.5-3 times higher than those for onshore turbines, offering attractive returns for those companies involved, although as with capital costs, service costs are starting to come under pressure as the base ages and more service companies target the sector. Due to the more complicated nature of the services required most wind farm operators prefer a full service offering, and the stage of market development means that the rate of switching suppliers is lower – not least because a significant portion of the installed base remains within the warranty period.

Part 3: Decision making and technology trends

Finding 9 // Technology and digital innovation in services is a key factor in future revenues.

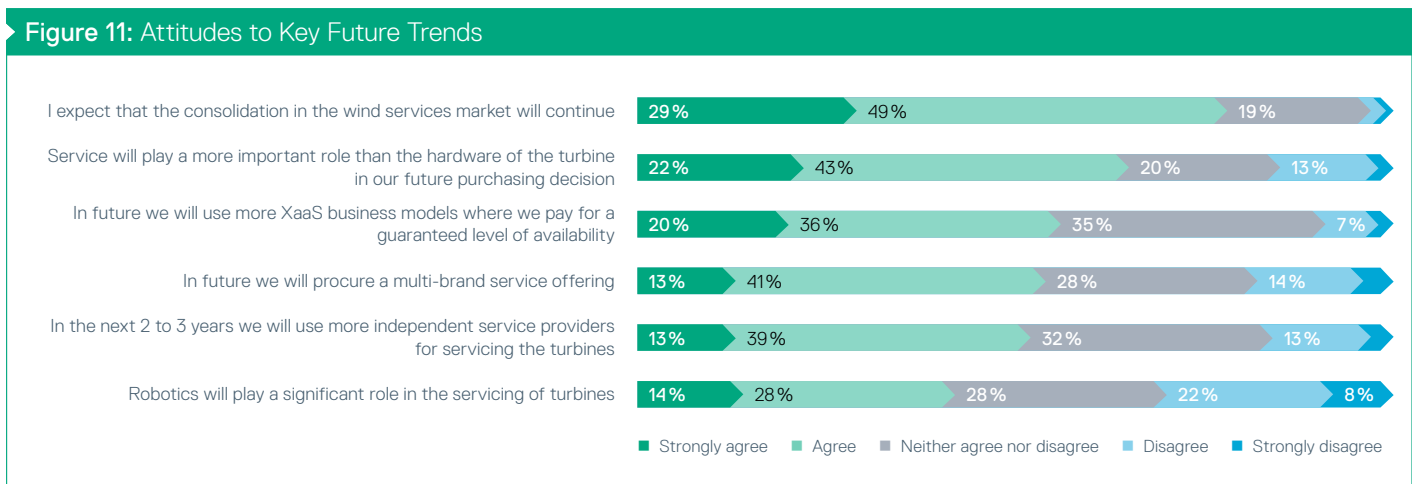
42% of respondents expected robotics to play a role in servicing within the next 2-3 years.

Remote monitoring and outcome based offerings around guaranteed availability are now firmly entrenched within the sector. The survey confirmed this, with 79% of respondents already having remote monitoring capabilities. Growth in this area is now around using digital technology solutions to improve monitoring, increase the effectiveness of predictive maintenance, and maximise the efficiency of operational assets.

Robotics is one example of a technology that was highlighted in the survey. 42% of respondents expected robotics to play a role in servicing within the next 2-3 years, but there were significant regional variations; in the more

mature European market, the likely use of robotics scored 79%. Drones are already being used to inspect wind turbines to measure the levels of degradation of rotor blades. Their usage will continue to be expanded as a way of reducing costs and improving service efficiency.

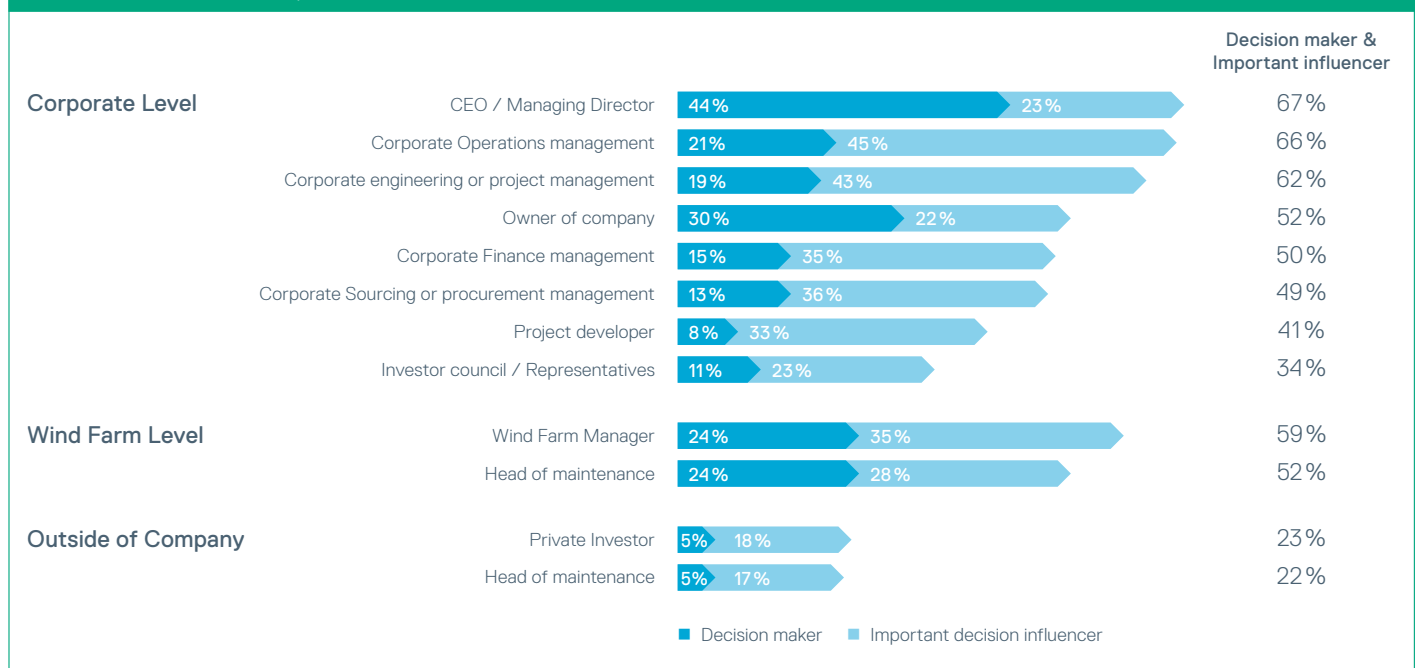
Digital also means more data. Market experts confirmed that wind OEMs and ISPs were looking to expand their offerings in this space (through analysis of operational data) as a way of differentiating their service offerings. OEMs are acquiring companies with remote service capabilities where necessary to achieve this.



Source: Frost & Sullivan analysis

Finding 10 // Decision making is relatively centralised, with decisions either taken at headquarters or at the site following company policy.

Figure 12: Given your experience, what is the role that each party listed below has in determining which service maintenance provider will be selected?



Source: Frost & Sullivan analysis

The survey revealed that there is limited autonomy in decision making, with senior people at a corporate level heavily involved in any decision. There is some variance depending on the situation; for scheduled maintenance, only 12% say the decision is taken at the wind farm site level, but this increases to 24% for unscheduled, probably due to the need for a quicker decision. But the survey confirmed that between 63% and 73% depending on the type of service would either be

decided at head office or would follow a clear company policy. Top management has a strong influence on the decision making process; CEO's are either the key decision maker or an important influencer in 67% of cases. Private or institutional investors were only a key decision maker or influencer in 23% of cases, but this is likely to increase as investors are becoming more actively involved in operational aspects of wind farms.

Outlook: What do service companies need to do to succeed?

- ▶ Be prepared to compromise and work in partnership with wind farm operators to offer tailored solutions that enable them to play a role in servicing. This could include offering premium-only service packages (allowing wind operators to do the basics) and licences for service company developed software solutions that would enable a wind operator to monitor its' own asset base.
- ▶ Wind OEMs that are vertically integrated with component suppliers are in a better position to increase revenues while reducing costs, improving product quality, and enhancing their overall competitiveness in the market. This is likely to become important in attempting to defend their position against ISPs.
- ▶ With 58% of wind farm operators using multiple brands within their wind farm portfolio, a multi-brand strategy is vital for any service company – knowledge of one brand is not enough to compete effectively in the market. The integration of services through a multi-brand strategy is cost effective to customers while increasing revenue potential for service providers. Reverse engineering may enable this to happen and to allow ISPs to continue competing aggressively with wind OEMs for contracts.

Research design and methodology

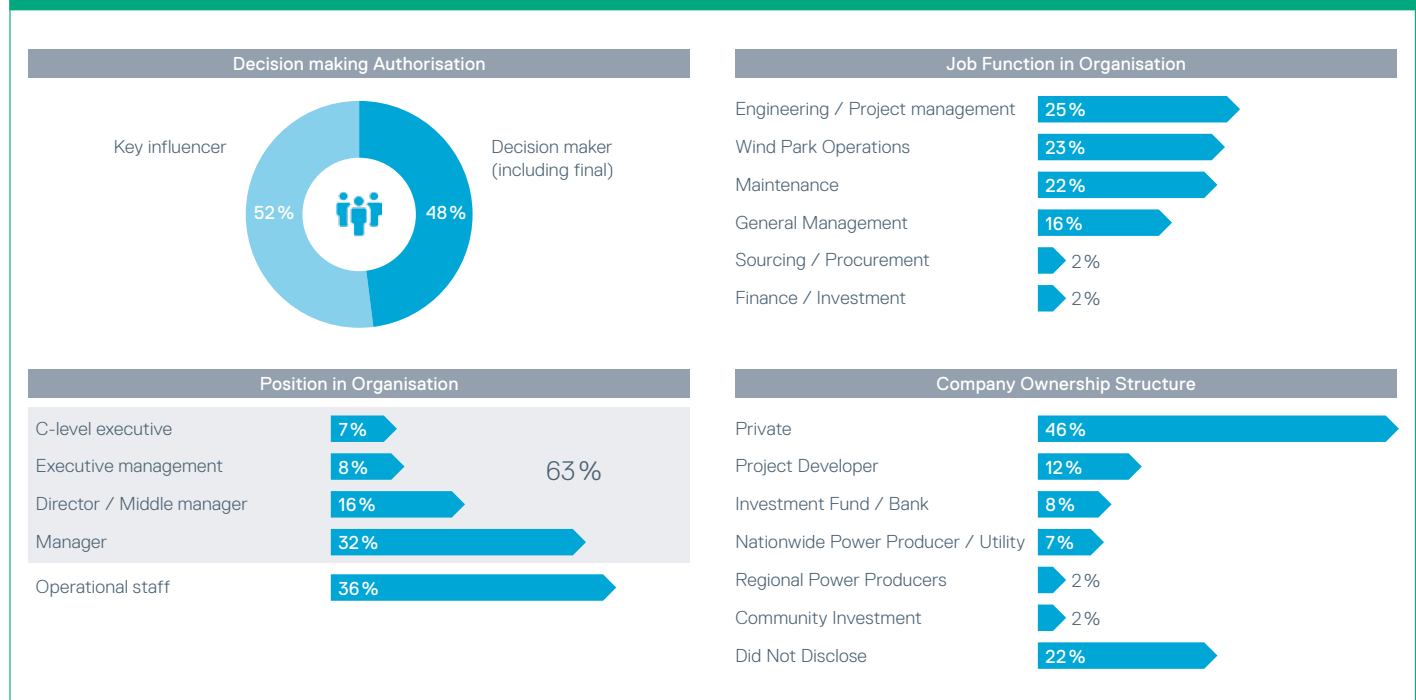
Taylor Wessing participated in a research study that Frost & Sullivan undertook into the global wind services market, covering primarily Europe, but also North America, Latin America and Asia (China and India). Frost & Sullivan engaged with a provider to conduct 175 interviews with wind farm operators (165 onshore and 10 offshore). The research was focused on:

- ▶ Key market trends
- ▶ Supplier sourcing strategies
- ▶ Key criteria for service contracts
- ▶ Attitudes to supplier switching
- ▶ Decision making processes
- ▶ Future technology and business model trends

The interview profile is shown in the graphic below:

Frost & Sullivan also conducted interviews with 40 market industry participants (wind OEMs, component suppliers and service organisations) to gather their perspectives on how the market is likely to evolve in the future. The entire study was project managed and led by Jonathan Robinson, Principal Consultant, Frost & Sullivan, London.

Figure 13: Which of the following most closely represents your present job function? Which of the following most closely represents your position within your organisation? What is the ownership structure of the wind farm you operate?



Source: Frost & Sullivan analysis

Contacts

About Taylor Wessing

Taylor Wessing is a full-service international law firm, working with clients in the world's most dynamic industries. We take a single-minded approach to advising our clients, helping them succeed by thinking innovatively about their business issues.

Our focus on the industries of tomorrow has enabled us to develop market-leading expertise in

- ▶ Energy
- ▶ Technology, Media and Communications
- ▶ Life Sciences
- ▶ Private Wealth

Taylor Wessing has over 1,200 lawyers across Europe, the Middle East and Asia, offering an integrated service across the full range of practice areas. We support clients wherever they want to do business. Our 33 offices around the world are not token presences – they blend the best of local commercial, industry and cultural knowledge with international experience to provide proactive, integrated solutions for our clients. At Taylor Wessing we are proud of our reputation as a forward-thinking firm.

Taylor Wessing Team



Carsten Bartholl
Partner, Hamburg
c.bartholl@taylorwessing.com



Dr. Tillmann Pfeifer
Partner, Hamburg
t.pfeifer@taylorwessing.com



Dr. Janina Pochhammer
Partner, Hamburg
j.pochhammer@taylorwessing.com



Dominic FitzPatrick
Partner, London
d.fitzpatrick@taylorwessing.com



Olivier Laffitte
Partner, Paris
o.laffitte@taylorwessing.com



Nicolas de Witt
Partner, Paris
n.dewitt@taylorwessing.com



Dr. Erwin Hanslik
Partner, Prague
e.hanslik@taylorwessing.com



Azman Jaafar
RHTLaw Taylor Wessing
Partner, Singapore
azman.jaafar@rhtlawtaylorwessing.com



Olav Nemling
Partner, Warsaw
o.nemling@taylorwessing.com

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best in class business model innovation and leadership by helping them get prepared for the next profound wave of industry convergence, disruptive technologies, mega trends and increasing competitive intensity.

With more than 55 years of experience Frost and Sullivan has evolved into one of the premier growth consulting companies in the world. The company's Growth Partnership Service provides disciplined market intelligence, customer insights and bespoke strategy consulting to drive powerful growth strategies. Frost & Sullivan is partnering with the global top 1000 companies, mid-market and emerging businesses, as well as the public sector and the investment community. Frost & Sullivan operates from more than 45 locations globally. For a complete list of offices and a brief timeline of Frost & Sullivan's corporate journey, please go to <https://ww2.frost.com/about/our-history/>

Frost & Sullivan Team



Sven Thiede
Director Energy & Environment, Frankfurt
sven.thiede@frost.com



Jonathan Robinson
Principal Consultant Energy & Environment, London
jonathan.robinson@frost.com



Michael Ranke
Vice President Customer Research Europe, Frankfurt
michael.ranke@frost.com



Anna Pankowicz
Consultant, Warsaw
anna.pankowicz@frost.com



Taylor Wessing Offices

Amsterdam

Parnassusweg 823
1082 LZ Amsterdam
T. +31 88 0243 000

Beijing*

Unit 2307&08, West Tower, Twin Towers
B-12 Jianguomenwai Ave
Chaoyang District
Beijing 100022
T. +86 10 8587 5886

Berlin

Ebertstraße 15
10117 Berlin
T. +49 30 88 56 36 0

Bratislava

Panenská 6
81103 Bratislava
T. +421 2 5263 2804

Brno*

Dominikánské náměstí 4/5
602 00 Brno
T. +420 543 420 401

Brussels

Rue de Livourne, 7 Box 4
1060 Brussels
RPR/BCE 0877631.254
T. +32 2 290 0339

Budapest

Dorottya u. 1, III. em.
1051 Budapest
T. +36 1 327 04 07

Cambridge

24 Hills Road
Cambridge, CB2 1JP
T. +44 1223 446400

Dubai

26th Floor, Rolex Tower,
Sheikh Zayed Road, PO Box 33675
Dubai
T. +971 4 309 1000

Düsseldorf

Benrather Straße 15
40213 Düsseldorf
T. +49 211 83 87 0

Eindhoven

Kennedyplein 201
5611 ZT Eindhoven
T. +31 88 0243 000

Frankfurt

Thurn-und-Taxis-Platz 6
60313 Frankfurt a.M.
T. +49 69 971 30 0

Hamburg

Hanseatic Trade Center
Am Sandtorkai 41
20457 Hamburg
T. +49 40 36 80 30

Hanoi

RHTLaw Taylor Wessing
Unit 1501B, 15th Floor Charmvit Tower
117 Tran Duy Hung Street
Cau Giay District
T. +84 4 3974 8881

Ho Chi Minh City

RHTLaw Taylor Wessing
Suite 1101, 11th Floor
Sofitel Central Plaza
17 Le Duan Boulevard, District 1
T. +84 8 38206 448

Hong Kong

21st floor, 8 Queen's Road Central
T. +82 3700 4099

Jakarta**

HPRP
Wisma 46 Kota BNI, 41st floor
Jl. Jend Sudirman Kav 1,
Jakarta 10220
T. +62 21 570 1837

Jeddah**

Alsulaim Alawaji & Partners
PO Box 1512
Jeddah 21441
T. +966 12 616 3939

Kiev

Illinsky Business Center
vul. Illinska 8
04070 Kiev
T. +38 044 369 32 44

Klagenfurt

Alter Platz 1
9020 Klagenfurt
T. +43 463 51 52 27

London

5 New Street Square
London EC4A 3TW
T. +44 20 7300 7000

London Tech City

Second Home
68-80 Hanbury Street
London E1 5JL
T. +44 20 7300 7000

Munich

Isartorplatz 8
80331 Munich
T. +49 89 2 10 38 0

New York*

41 Madison Avenue, 31st Floor
NY 10010
T. +1 650 617 3336

Paris

69 avenue Franklin D. Roosevelt
75008 Paris
T. +33 172 74 03 33

Prague

U Prašné brány 1
110 00 Prag 1
T. +420 224 81 92 16

Riyadh**

Alsulaim Alawaji & Partners
PO Box 26668
Riyadh 11496
T. +966 11 462 8866

Seoul**

DR & AJU International Law Group
7/11/12/13/15F, Donghoon Tower
317 Teheran-ro, Gangnam-gu
Seoul
T. +82 2 3016 5200

Shanghai*

Unit 1509, United Plaza
No. 1468, Nanjing West Road
Shanghai 200040
T. +86 21 6247 7247

Silicon Valley*

1550 El Camino Real,
Suite 275, Menlo Park
California, 94025
T. +1 650 666 8403

Singapore

RHTLaw Taylor Wessing
Six Battery Road, #09-01, #10-01
Singapore 049909
T. +65 6381 6868

Vienna

Schwarzenbergplatz 7
1030 Wien
T. +43 1716 55

Warsaw

ul. Mokotowska 1
00640 Warsaw
T. +48 22 584 97 40

* Representative office

** Associated firm

