Summary

SUMMARY

Great potential for extra growth in the wind energy sector

The future is looking bright for sub-suppliers (referred to as suppliers below) who make sure to acquire the right technical competencies and position themselves correctly in the value chain. At the same time, this will make wind energy even more competitive.

The sector development project demonstrates that the current distribution of roles in the wind energy sector is in a state of flux. Customers are increasingly searching for suppliers with the capacity to deliver more products and services than previously. In this context, the customers are both wind turbine manufacturers and the energy companies that develop wind farms—known simply as 'developers' in the sector.

One example is that of a supplier who has previously only delivered a specific component being offered the opportunity to supply a complete sub-system featuring the original component. Another example is that the supplier, over and above being given the chance to deliver a component or sub-system, may also be asked to take responsibility for the maintenance work. In both examples, the benefit to customers is that they can devote more time to their core competencies when a supplier shoulders responsibility for a larger share of the value chain.

At the same time, the project reveals rising awareness in the sector that increased focus on operation and maintenance may make it possible to reduce the costs of wind power significantly. Of course, there is still work to be done to lower the costs linked to manufacturing the turbines themselves, but because research in the fields of operation and maintenance has been accorded lower priority to date, the opportunities for savings and streamlining are much greater in this area.

Winning on knowledge

The Danish Wind Industry Association estimates that up to 500 Danish companies are suppliers to the sector. In partnership with the Danish Industry Foundation, DTU and the Danish Wind Industry Association have studied the potential for growth among supplier companies. The underlying thought is that additional growth in the field of Danish wind power demands 'winning on knowledge', In the same way as for industry in general, success for the Danish wind energy sector is dependent on products and solutions featuring a high level of knowledge—and thus elevated value.

In this context, it is pleasing to note that the share of engineers and other highly qualified people in the wind power industry is on the rise, without a corresponding drop in the total number of other employees. There are, however, signs that there is room for improvement in several areas. While the Danish wind turbine manufacturers and developers are already extremely active in the field of research, this is far from the general rule among suppliers. According to a recent report from the national partnership Megavind, only 20 per cent of suppliers to the sector have participated in public sector research and development projects linked to wind power.

Companies and researchers should work more closely together

The report from Megavind also reveals that fully 62 companies which have taken part in a single innovation project backed by public funds subsequently declined to participate in new projects. This high drop-out rate means that in all, only five per cent of the companies have worked with university researchers on more than one project.

Both Danish and international studies demonstrate that companies which are active in the area of technological development and innovation achieve higher growth than companies that are not. Therefore, it should be a goal in and of itself to increase the number of suppliers to the wind energy sector that participate in innovation projects, and to ensure that those companies that are already active ramp up their level of involvement.

Against this background, the sector development report places high emphasis on finding areas ripe for partnership between knowledge institutions and commercial companies, and on proposing ways to overcome the obstacles to partnership that currently exist.

Five main types of supplier

The project identifies five main types of supplier.

There are the classic suppliers to the wind power industry, who sell components, sub-systems and/or services to suit customer specifications. The project suggests that the members of this group are generally interested in greater openness between customer and supplier. In addition, they would like to place more emphasis on operation and maintenance.

Fundamentally, the hi-tech suppliers enjoy a favourable role with regard to taking responsibility for a larger part of the value chain. The challenges facing them include dealing with guidelines for tests and documentation, as well as building up influence that extends beyond their own technological niche—system responsibility, in other words.

The suppliers with system responsibility have already adapted to the new distribution of roles requested by customers. These companies are looking for more standardization within the wind energy sector, along with greater emphasis on understanding the system as a whole.

Suppliers with test competencies have their own facilities which can, for example, be used to document that components and sub-systems live up to requirements for reliability, etc. This group of suppliers is experiencing a high level of demand, but is seeking tighter relationships with companies on testing, as well as general research into issues such as how wind turbines age.

Finally, suppliers to the developer segment are dealt with separately. The members of this group of suppliers have excellent potential for participating in interdisciplinary partnerships centred on the best methods for establishing foundations for offshore wind turbines, or on logistics, etc. Smart solutions for the remote monitoring of offshore turbines are also in great demand.

Recommendation: improve framework for research partnerships

A consistent message from many of the suppliers interviewed for the report is that they want to see more equality in relation to their participation in customers' research and development work. Examples mentioned include that of a supplier who may be a world leader in manufacturing bearings, but has little idea of the actual sources of load. In this case, a good understanding of the entire wind turbine would almost certainly result in an improved design of the sub-system in question.

Therefore, the first main recommendation from the report is: Give suppliers more responsibility. In particular, the report recommends that all the key players—the suppliers themselves, their customers, knowledge institutions, public authorities and politicians—should contribute to giving the suppliers a boost. Specifically, the report suggests establishing more research and development projects that are open to small enterprises.

At the same time, the sector research project reveals that a number of obstacles exist today that prevent suppliers from joining innovation partnerships. Therefore, the second main recommendation from the report is: Improved framework for supplier involvement in projects. For example, the report recommends that small enterprises team up with larger companies and/or with knowledge institutions that have the necessary resources to submit applications and so on. It also recommends participating in the meetings for suppliers organized by Wind Energy Denmark and DTU. Finally, the report presents a range of recommendations for how DTU can otherwise open up to suppliers to the wind power industry.

Operation, system understanding and tests

In addition to the challenges and solution options that are special for each of the five main types of supplier, the project succeeded in identifying three general themes.

Many companies, across boundaries between the supplier groups, highlight the fact that great potential exists for boosting efficiency—and thus helping to make wind energy even more competitive—by focusing on operation and maintenance. In these areas, the in-depth knowledge of products and processes that suppliers possess can be applied in practice to a much greater extent than they are today.

Suppliers also highlight other areas that are accorded inappropriately low priority today. This applies in particular to system understanding—i.e. thinking in terms of the entire wind turbine and/or the entire electricity system when designing a given sub-system—and to testing. Both system understanding and testing are key preconditions for making the correct long-term choices that make it possible to optimize operation and maintenance.

Recommendation: greater emphasis on operation and testing

When customers no longer look exclusively at the costs associated with purchasing the components, systems, and services delivered here and now, but view the purchase from a holistic perspective that takes into account the costs throughout the entire operating period, it often becomes clear that there is appreciable potential for optimization. This typically demands a close working relationship, where customers and suppliers share their knowledge to a higher degree than usual—an approach that is fully in line with the other recommendations from the report.

Moreover, greater focus on operation and maintenance will naturally lead to additional emphasis being placed on system understanding and testing.

Therefore, the third main recommendation from the report is: Greater focus on operation, system understanding, and testing. In particular, the report recommends developing the Danish test infrastructure specifically for the wind power industry. At the same time, it recommends that companies join forces with each other and with knowledge institutions such as DTU with a view to achieving influence on international standardization in the area.

A large number of more detailed recommendations are presented in the final chapter of the report.