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# Essential support for wind blade manufacturers and beyond

*Inside Composites* spoke to Julien Sellier, Managing Director of STRUCTeam, which provides management and technology consultancy services within the composites application markets.

## **Please tell our readers what services STRUCTeam provides?**

**Julien Sellier:** STRUCTeam was founded in 2010 and we are based in Cowes, on the Isle of Wight. We provide management and technology consultancy services to organisations seeking a composite solution for their business and products. Our expertise covers the entire composites product lifecycle and supply chain. We work predominantly in Europe, North America and Asia. We apply our technical and commercial capabilities to help clients develop their composite business. We support the development of applications from the concept and business case stage all the way to serial production. Depending on our clients' objectives and in-house capability, we complement where gaps in knowledge, experience or resources are identified.



We strongly believe in a multi-materials approach and a lot of STRUCTeam's work is to manage interfaces and the integration of numerous materials to form a solution. This enables our customers to incorporate the most effective combination of materials, process and design factors to meet performance, cost and reliability requirements.

STRUCTeam is independent, passionate about the industry and dedicated to finding the most effective solutions for our clients where requirements are driven by technical, commercial or supply chain challenges.

## **Could you say a little about the current projects you're involved with?**

STRUCTeam is heavily involved in composite engineering for wind turbine blades and we have recently collaborated with two materials suppliers to produce blades more cost effectively. This consortium is called PULLWind.

Our partners are Olin, formerly Dow Epoxy, a leading global supplier of epoxy resins, curing agents and tougheners, and Chongqing International Composite Material Co Ltd (CPIC), a state-owned enterprise integrating R&D, production and sales of glass fibre products.

PULLWind's objective is to supply a robust, 'off the shelf' solution for pultruded spar caps for blade manufacturers. We offer customers a secure supply chain with design and manufacturing guidelines. Among other design aspects, this allows the customer to adopt the technology and benefit from cost and performance improvements. The concept minimises performance risk, fast-tracks time to market for the wind energy OEM and can reduce the total blade cost by up to 10%. STRUCTeam is also making significant progress within the automotive and civil engineering sectors. We are working on several architectural and bridge projects and have developed working relations with Tier 1 suppliers in Europe, Asia and North America.



**What are the factors behind the current growth of the offshore wind power industry?**

**JS:** It is good to see the UK still leading the way in offshore power and these developments have boosted relations with several countries including China. China has a tremendous offshore potential - 600-700GW depending on sources. This is largely unexploited.

During 2017 many new wind projects ceased being subsidised by governments. This marked a turning-point and effectively levelled the entire energy market.

The financial institutions are now realising wind energy is a viable, long term and competitive alternative to fossil-based energies along with solar power, biomass and hydroelectricity.

Broadly speaking, wind energy OEMs have become accustomed to a protectionist environment so they must adapt to this evolution of the competitive environment. This could mean that 2018-2019 are transition years within the industry. In parallel to this, the European market has also seen a number of consolidations with the mergers of Siemens and Gamesa, Nordex and Acciona, and GE and LM.

**Which regions are seeing the highest growth?**

**JS:** China is leading by volume and Europe and North America tend to drive the technological advancements. Now the government and their legislation have a lesser impact on new wind farms, 2018 and 2019 are likely to see a shift where the Asian OEMs will bridge the technology gap and potentially lead future technological growth.

**What are the key considerations when designing a wind blade?**

**JS:** Each OEM has their own philosophy and strategic positioning and this impacts on how the design work is approached. In terms of blade design; cost, weight and performance are always the key drivers, whereas turbine design is focused on LCOE (levelised cost of energy). In China you essentially work at the blade level but in Europe and North America the trend is to design blades using the LCOE of the turbine as the product performance indicator. The LCOE includes all the turbine components including the blade from an OPEX and CAPEX standpoint. This combined with the performance of the turbine therefore reflects the value proposition for OEM's to the wind farm owners.



**Recently, carbon fibre composites have started to be employed in a market traditionally based on glass fibres. What's the reason for this? What does carbon fibre contribute?**

**JS:** Personally, I believe the widespread adoption of carbon fibre in turbine blades is yet to come. Although carbon has the potential to achieve a lower cost of energy, it is our view that the majority of blades will continue to be manufactured with glass fibre over the next 3-5 years. Despite carbon fibre's strength and stiffness benefits, the cost is still seen as prohibitive for many. It is often a question of whether you afford to put carbon in your blade and then be able to offset the additional cost at the turbine level. Our PULLWind consortium helps this initiative by enabling our clients to reduce the time to market.

**You've noted a decade ago that 2MW turbines were the largest platform available, and now the average is 6-8MW. What challenges has this posed, firstly in terms of blade design, and secondly to the supply chain in operational and logistics terms?**

**JS:** The industry has matured significantly and important lessons have been learnt over the last 10 years. A lot more scrutiny and fatigue testing take place today for blades and engineering studies have become increasingly important. Onshore turbines are hard enough to maintain but offshore structures present serious challenges so the manufacturing and through life maintenance processes must be managed diligently and rigorously.

In terms of supply chain, the growth of the industry means that it is closing the gap with how the automotive industry is set up with Tier 1 and Tier 2 suppliers driving the latest innovations to the OEM's. In turn, the whole composites industry has benefitted from this growth to professionalise itself through the wind energy market's evolution.

Author:

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