April 2017

Dear Mr Clark,

CLF Response to HM Government: Building our Industrial Strategy Green Paper

Introduction[4 19 25 26]

The green paper for a new Industrial Strategy is a huge opportunity to realign our understanding, priorities and approach to industrial business development, growth markets and competition; to the overall benefit of UK PLC.

Government engagement and partnership with the industry is both hugely important for ultimate delivery and has also been very well received. I am very pleased to be involved and really value this opportunity to respond, offering comments and thoughts on the green paper, on behalf of the Composite Leadership Forum. Instead of just answering the questions, this response takes a slightly different approach and looks at the issues from the perspective of the composites industry.

Supply chain, Technology, Skills, Regulation and Sustainability are the 5 key areas that underpin the rapidly growing global composite market. The following comments focus on these and the level of alignment with the 10 pillars of the green paper. Reference to the consultation questions are shown in superscript adjacent to each heading.

It is worth noting at this point that the latest market data points to a huge and growing composite market opportunity exceeding £10Bn to 2030.

Whilst every effort is understandably being made to try and keep the Strategy green paper and Brexit discussions separated, there is an underlying connection that cannot be avoided; the risk of increasing or changing trade barriers, adversely affecting the willingness or ability of companies to invest for the future in the UK. This is of fundamental importance to supply chain investments in the UK. Without a clear and well communicated plan to address this, large foreign-owned companies, will find it increasingly difficult to justify investment in the UK and will look to invest elsewhere.

Supply Chain [3 7 18 19 20 22 24 25 26 31]

Composite materials were proven through significant uptake in the aerospace sector to reduce emissions and fuel bills. It is therefore no longer an ‘emergent technology’, but it is better described as a ‘developing’ one because other sectors, such as automotive, rail and construction, are now investigating high volume use of these materials.

The UK composite supply chain needs support to grow from its world-class, but low volume production capability as an emergent technology, to become an extensive supply chain with

high productivity manufacturing delivering high volume composite parts across multiple sectors for the UK and export markets, as other countries are already doing.

The CLF is working with existing UK companies to expand their current capabilities to include composites and also with potential inward investors to develop the supply chain required. However an example of the types of challenges being faced is shown in UK production of carbon fibre.

In order to fully exploit the growth opportunities in the composites sector the UK must increase production capacity of carbon fibre and prevent the need to import up to £3.4bn of carbon fibre by 2030. The long term business gains that have been shown by industry, by having carbon fibre manufacturing plants in the country are huge. The investments however are very significant and in the current investment climate, offer minimal return on investment in the short term. Extended investment payback periods and energy support are common off-shore, and automatically make the UK uncompetitive in this area. Without alternative and innovative commercial support from Government, this short term banking and investment mindset is a very significant growth barrier and prevents the fibre supply companies investing in the UK. Capacity growth needs to be aligned with the market growth potential from the UK. Currently it isn't. Investment and energy deal support is fundamental to competitive fibre production in the UK.

Commercial and political supply chain support should focus on creating and fostering a competitive commercial environment with mainland Europe and North America – timely incentives for capex investment, tax reduction approaches, no trade barriers, stable political and tax regimes, energy deals and greater clarity of available Government support, where current perceptions are not always positive. All these approaches are being currently offered in one way or another by competing countries in mainland Europe and North America, so the communication of UK Government support in these areas must be increased.

In mainland Europe, Germany, France, Italy, Slovakia and others have been enjoying this type of support for years and are leading the way in competitive composite supply chains.

Focusing on our internal growth aspects is fundamental to creating the core technology expertise, skills and business development necessary to then take advantage of the export markets.

The sector deal approach being encouraged could be very effective, and shows a very welcome and positive change in Government understanding, but a stable political environment with continued focus and support will be required by subsequent governments as well, to reap the real longer term benefits. As discussed at the Round-Table events that you hosted, for sector deals to actually deliver real benefit, they should actually be cross sectorial.

Cross sectorial supply chain understanding will automatically support the growth of other sectors in the Composite industry including: high performance structures (Aerospace), the rapidly growing mid to high volume production (automotive, rail etc), Large structural applications (infrastructure), materials development and supply (all sectors) and tooling, equipment and other services (all sectors).

Technology [3 7 8 9 10 22]

The Science, Engineering and Technology base is an essential and fundamental part of the innovation-to-commercialisation chain. It provides underpinning and new know-how, develops new technology to solve issues and enable new and refined processes, tools etc. This must be in place, stable and well supported to ensure the future pipeline continues to flow.

Continued research into composite materials and technologies must be promoted. Collaboration with the chemicals sector to develop competitive new and existing materials that add value to the customer is required. "Me too" technology is a stop-gap at best, and adds very little value, unless it is combined with other higher value production and process manufacturing benefits such as automation or engineering design.

Engineering simulation tools, process know-how and engineering expertise in design-for-manufacture, assembly, performance and functionality, repair and recycling are fundamental to an industry that works across so many sectors. Total cost of ownership of a composite application is key to its added value and technology transfer from one composite sector to another within the UK is fundamental. Investment support in these engineering activities is limited and slow, in part possibly due to an inherent misunderstanding of their importance. Capabilities that are difficult to quantify or measure receive less overt support which as a result, drives companies away from the UK. The composite industry would support a review of the funding support for engineering, incorporating the relevant engineering institutions and supply chain to clarify the needs.

The High Value Manufacturing Catapult's significant contribution to development of composite technology and uptake by industry is welcomed. The CLF has identified that there is a need for support of the manufacture of composite materials as well as products, which could be addressed through expansion of the Catapult's capability and aligned with significant capability in the North of the UK.

The current R&D funding support approaches from Innovate UK (IUK), Advanced Propulsion Centre (APC) and the Aerospace Technology Institute (ATI) for example, can be very effective, but their speed of operation and apparent understanding of the business and timing needs of the industries they support, is often lacking. We would welcome a review of their operational and communication processes. Industry would be pleased to offer

constructive feedback to help with this, as there are many examples of unexplained delays that have resulted in significant lost business.

Skills and Training[8 9 10 13 14]

The current pool of skilled people in the composites industry in the UK is small and as demand is increasing rapidly this has already become a major inhibitor to growth.

The forecast growth market demand will require increasing numbers of skilled and qualified people to develop, manufacture and support an ever widening range of composite products. These will not just be basic skills, but will be at all levels in many technologies and will include the higher levels skills aligned with the Industrial Strategy's ambition for research and innovation. Technology and innovation aspects of industrial strategy are not linked to a coherent 'people' strategy to deal with competing funding and control measures in place at different educational stages.

There is a significant lead-time to develop new people with the right skills, hence the importance of re-skilling and up-skilling those already in work with the necessary composites skills and knowledge to avoid delay. Both approaches, new entrants and re-equipping those in work, will require increased and appropriate training capability and capacity to meet demand.

It is ultimately the responsibility of the OEMs, Tier 1s and education establishments to drive the necessary training. However, without commercial and political encouragement and support from the Government and a longer term, managed approach to develop the core industrial skills, the costs to the supply chain will remain a significant barrier to growth.

With Government support, the industry needs to establish and articulate future skills demand aligned to current and emerging technologies. Whole-workforce training programmes from operator to researcher, including up-skilling of metals skill base and continued professional development are essential. Investment in the means of delivery is crucial - staff, learning resources and support are required for high quality education and training. Competence assurance schemes are needed to assist definition of training needs and to prove accreditation and the value that accreditation brings. A system developed with the support of Universities, Catapults and Institutions such as the Institute of Materials, Minerals and Mining, IMechE and EEF will ensure that knowledge is captured as part of the innovation process and translated into relevant training for employers.

Regulations, Codes and Standards [16 20 22 25 32 37]

One of the major inhibitors to the uptake of emergent materials such as composites, in new sectors is that regulations, codes and standards are often explicitly or implicitly based on named materials, such as steel. This makes use of alternative materials difficult despite the strengths and benefits of the new materials in many cases. Regulations should focus on performance not on materials. The composites industry is already working with regulators and standards bodies to adapt regulations to enable use of composites. The regulation bodies however are not aligned in their fundamental approaches, making changes in regulations slow, arduous and restrictive to business growth.

Cross sectorial databases for material testing and capabilities are needed, with common standards for key aspects such as mechanical properties, fire, smoke and toxicity, non-destructive testing and design codes where possible.

It is important to offer a series of demonstrators whereby the infrastructure of regulations, codes and standards are tested for their completeness alongside assembly and testing of the supply chain through realistic case studies. For example, in the construction field the soon to be published "GRP Design Guide" could be validated through a series of bridges built throughout the UK using local clusters of companies forming the relevant supply chain. Demonstration of these multiple "bridge" validations would give confidence to asset owners, specifiers, designers and companies from the supply chain. Similar exercises could be undertaken in other sectors to develop supply chains and confidence in engineering solutions based on polymer composites.

Sustainability [all]

Increasing the market penetration of composites will reduce environmental impact through weight reduction and durability, but there is a strong need to incorporate circular economy principles alongside the rapid development of composites. This is being driven by environmental legislation being adopted by end-use market sectors such as aerospace, automotive and construction. Research is needed to develop cost-effective, bio-based raw materials to further reduce environmental impact and de-couple prices from oil. Life cycle analysis needs to be more widely understood and more consistently applied. For sectors such as automotive where there is a need to have 95% recyclability, there is an ongoing need to develop new markets for recyclate from end-of-life and process waste. The government can support this growth area through pragmatic discussion and industrial evaluation. The composites industry would support this approach if it can be linked to longer term political and commercial stability.

All these activities, employed during the design and engineering phases of any industrial development, will reduce costs, reduce energy consumption, improve the green credentials

of the industry and the UK as a whole, adding significant value and improving UK competitiveness.

Summary

The combination of the 10 pillars discussed in the green paper, can offer massive benefit to UK PLC if:

1. the political and commercial environment for the short, medium and long term is stable,
2. Government continues and increases the priority of direct industry and supply chain involvement to craft the deliverable strategy. Coordination could be through industry cluster bodies such as the Composite Leadership Forum for example,
3. the strategy is executed, with specific objectives, measurable outcomes, attainable and relevant objectives to defined time plan.

We now have the opportunity to take advantage of the mood of the country and industry as a whole, to craft a strategy for the future that can become more competitive with the rest of the world, deliver high and stable growth, looks to consolidate the undoubted abilities and expertise in the UK, but importantly manages them in a more effective, efficient and coordinated approach for the future.

However, the industrial strategy must be at the very core of the political environment for the future. If the advice from industry is not heeded and if the effects of Brexit are not managed carefully, with a full awareness and understanding and priority on the longer term sustainable growth for UK PLC, we will fall heavily short of what is within reach.

Please contact me if you have any additional questions.

Yours sincerely

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Chairman of the Composites Leadership Forum