

COMPOSITES LEADERSHIP FORUM

Lightening the Load

Delivering UK growth
through the multi-sector
application of composites



Executive Brief
2015 UK Composites Strategy

Government and Industry
in Partnership

Global Opportunities for Composites

The worldwide market for composites end products in 2013, across all sectors, had a value of US\$68.1 bn. This market is expected to grow at around 6.5% CAGR over the next 6 years to about \$105.8 bn in 2020.

All figures are from Lucintel 2014, shown below under established global market categories.



AEROSPACE & DEFENSE	TRANSPORTATION	CONSTRUCTION	MARINE	ENERGY	WIND ENERGY
Global 2020 \$20 bn	Global 2020 \$15.6 bn	Global 2020 \$14.1 bn	Global 2020 \$2.5 bn	Global 2020 \$18.2 bn	Global 2020 \$9.8 bn



Not to scale

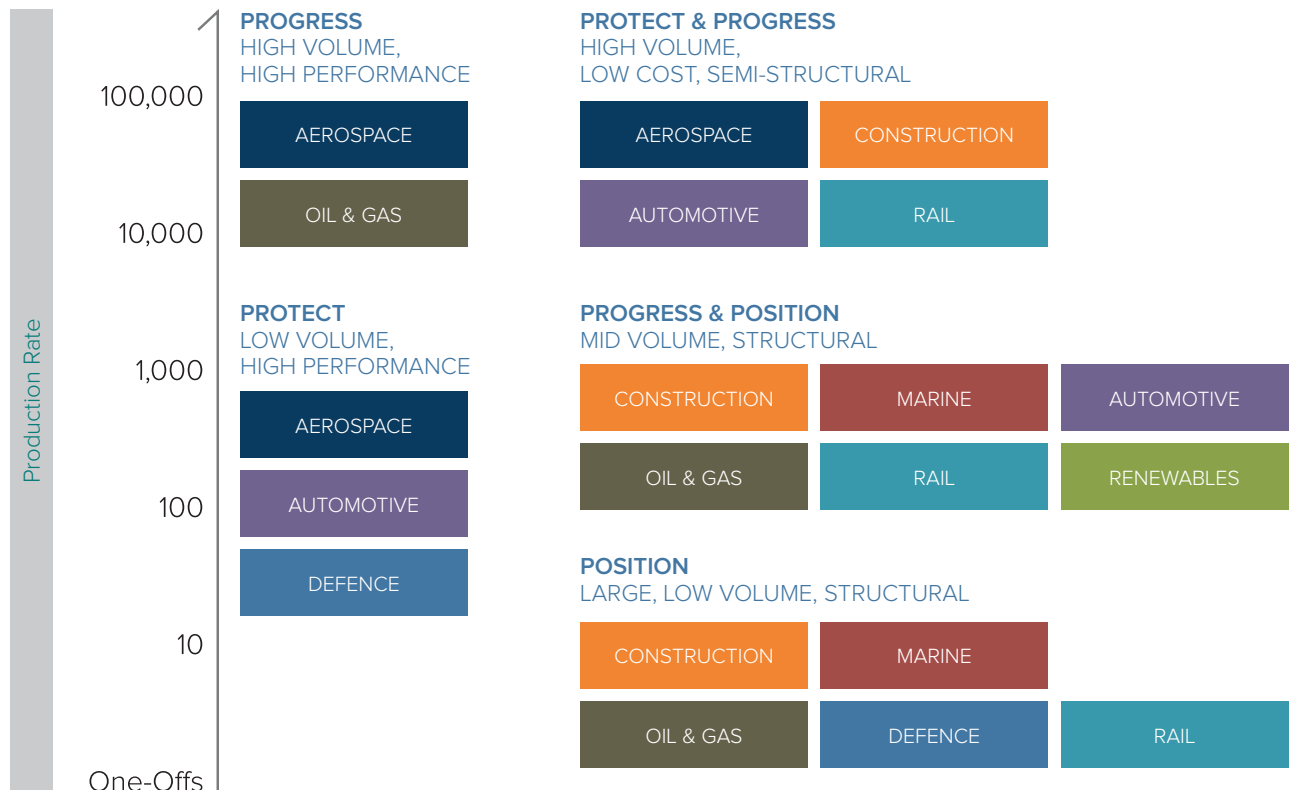
Analysis and Recommendations

CLF Working Groups have identified clusters of composites manufacturing in which the distinguishing characteristics are driven by scale factors: product performance, physical size and production rate. There are similarities within these **Manufacturing Clusters** in the use of production technologies, supply chain configurations, cost models and skill requirements across industrial sectors. The strategy presents a simplified view of these clusters and makes recommendations for further work based on increasing the level of knowledge sharing within these clusters.

The manufacturing cluster strategy will:

- Enable sectors within each cluster to benefit from knowledge transfer and to develop cross-sector, collaborative research and innovation
- Deliver greater impact in shorter timescales from available public funding
- Identify shared investment opportunities within manufacturing clusters
- Lead to accelerated commercialisation, a more competitive multi-sector supply chain and facilitate the greater application of composite materials

Composites Manufacturing Clusters



Connected actions to deliver multi-sector growth

Support UK composites science and technology

- Promote research into composites science
- Establish collaboration with other technical sectors such as chemicals
- Develop new and existing materials to increase performance (e.g. high temperature, through-life and smart)
- Enable sharing of materials and mechanical property data to facilitate new market entry
- Reduce development time, cost and risk using validated simulation and modelling tools
- Improve know-how in design for manufacture, assembly, performance and functionality

Develop skilled and knowledgeable people

- Capture and convert emerging knowledge into applied learning
- Establish and articulate future skills demand aligned to current and emerging technologies
- Implement competence assurance schemes to assist definition of training needs
- Develop whole workforce training programmes from operator to researcher, including up-skilling of metals skill base and continued professional development
- Continue work to establish cross sector composites apprentice frameworks
- Develop capable trainers and provide facilities to meet industry demand
- Increase awareness of the benefits of composites

Promote environmental sustainability

- Develop markets for recyclates with associated standards and support creation of GRP recycling supply chain
- R&D to integrate industrial biotechnology into the supply chain and optimise value of natural fibres
- Reduce waste in manufacturing
- Develop capability in life cycle assessment and costing to show the benefits of composites

Encourage successful UK composites supply chains

- Facilitate growth of existing supply chain for high performance structures
- Ensure development of UK supply chain capability for emerging mid and high volume and large structural applications
- Reduce time to market supported by rapid development funding routes
- Seek to build consortia and business arrangements that fulfill supply chain opportunities
- Support the implementation of a readily accessible UK supply chain capability database
- Encourage investment in UK supply chain companies

Use assurance and standards as enablers

- Establish composites materials test and database capability
- Develop standards for process related measurements; and for fire smoke and toxicity
- Develop non-destructive methods for thick sections and large scale manufacture
- Implement design codes for structural applications
- Work with regulators to adapt regulations to enable use of composites

Composites Leadership Forum Vision

The UK should be recognised as one of the world's leading places for the research and commercial exploitation of composite materials and processes.

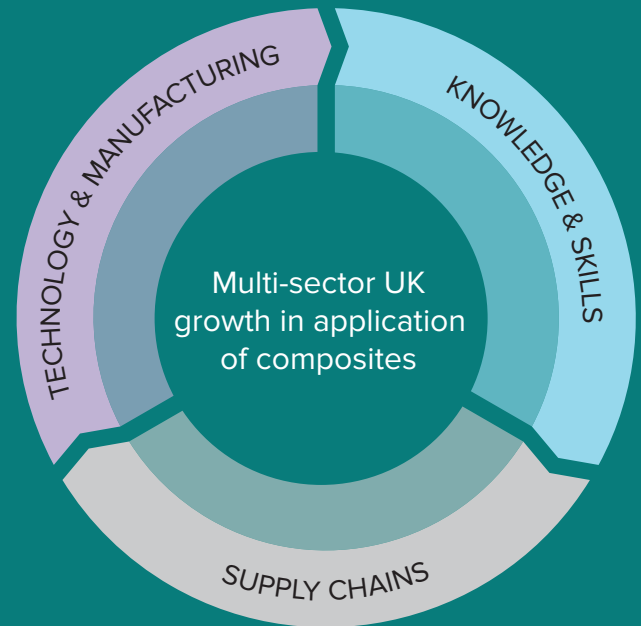
The CLF works to influence government and industry. Our aim is to create a balanced innovation pipeline of leading composite science research and technology development; skilled people at all levels and supply chains with the right capability, capacity and competitive proposition.

The strategy proposes three key aims for industry and government to secure UK market share:

PROTECT and accelerate organic growth in the already established sectors using composites.

PROGRESS developments in technologies and supply chains to capture mid and high volume opportunities.

POSITION and enable UK industry to make a paradigm shift, taking advantages of composites in emerging user sectors.

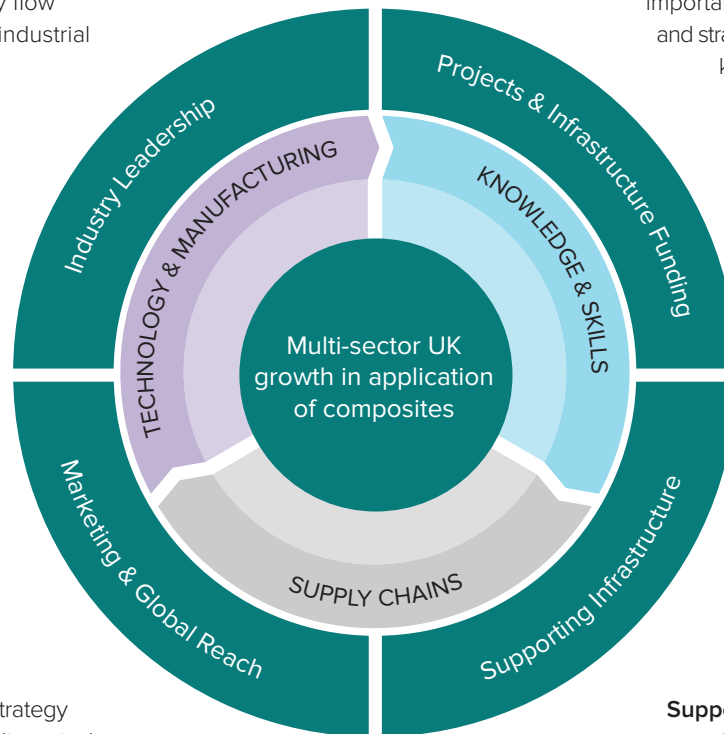


Wider strategic objectives support these aims:

- **FOSTER** the growth of composites science research and technology development
- **ADDRESS** the need for assurance regimes and standards enabling the take up of composites in new sectors
- **DEVELOP** capability in life cycle assessment and costing to show the financial and environmental benefits of composites
- **ENSURE** composites industry growth is environmentally sustainable
- **AVOID** unnecessary duplication by widening understanding of opportunities and communication between funding bodies

Composites Leadership Forum – delivering the strategy

Industry Leadership: The CLF works with industry sector bodies to ensure that there is two way information and activity flow between the composites industry, industrial sector strategies and companies delivering growth.



Marketing & Global Reach: The strategy recognises the need to address delivery in the context of global opportunities and threats and to promote UK capability. UKTI work on trade and inward investment is an important factor for industrial growth and access to new markets through dissemination and international collaboration.

Project & Infrastructure Funding: Including BIS, DfT, EPSRC, Innovate UK, KTN all provide important input to the CLF on national policy and strategy. They will also use the output and knowledge of the CLF to influence their funding decisions and support for strategic projects.

Supporting Infrastructure: Organisations that take actions from this strategy to support industry. CIMComp at low-TRL, the NCC, wider HVMC, composite centres and RTOs with mid-TRL resources to support research and development. Composites UK (the industry trade body) will represent supply chain companies and the wider industry.