

Advanced Manufacturing

A Roadmap for unlocking future growth
opportunities for Australia

SUMMARY

CSIRO FUTURES

CSIRO Futures is the strategic advisory
arm of Australia's national science agency.

Megatrends: How is the sector changing?

MADE TO MEASURE

Advances in technology and greater consumer expectations are causing a shift from mass production of goods to bespoke solutions.

SERVICE EXPANSION

Manufacturers are expanding their role in the value chain from making 'widgets' to developing tightly integrated service-product bundles.

SMART AND CONNECTED

Advances in data capture and analytics are optimising operations across the manufacturing value chain and the factory floor.

SUSTAINABLE OPERATIONS

Resource scarcity and increasingly valued environmental and social credentials are encouraging manufacturers to look for more efficient and sustainable processes and operating models.

SUPPLY CHAIN TRANSFORMATIONS

Specialisation is promoting greater collaboration in some markets while technological advancements are enabling the vertical integration of others.

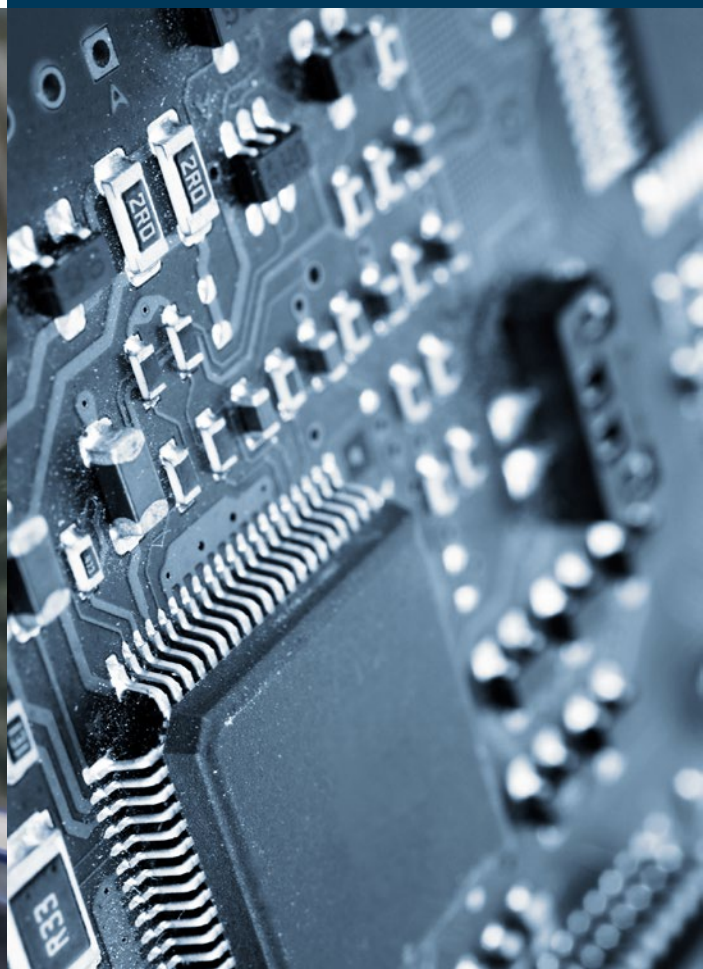
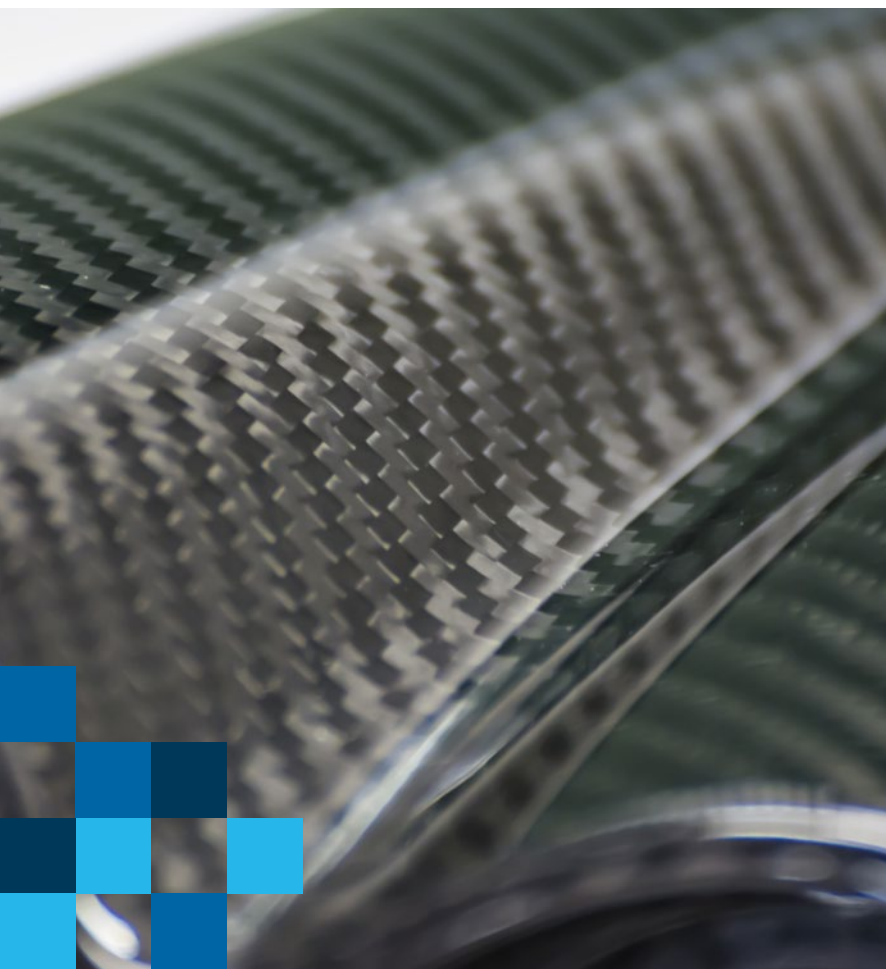
What challenges do we face?

Globalisation, digitalisation and the increased demand for more bespoke and complex solutions are causing Australia's long-standing disadvantages (small/dispersed local market, geographic remoteness and high labour costs) to be less important.

Governments, industry and research should instead focus on addressing:

- risk averse culture
- segregated national agenda
- poor commercialisation
- quality and quantity of leaders.

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How can the sector grow?

Through extensive industry and research consultation, the Roadmap identified a number of growth opportunities and enablers:

1 Customised high-margin solutions

Rising income growth in developing regions coupled with the increasing expectations of customers in developed economies is creating demand for more specialised and customised product offerings. Australia's many SMEs are primed to specialise in premium bespoke solution markets.

2 Sustainable manufacturing

The current levels of competition for critical and increasingly scarce manufacturing resources such as water, raw materials and energy is not sustainable. A recent global study found that 59% of executives believe that sustainability initiatives are improving their growth and profits, spurring global investment in innovative sustainable products and processes.

3 Selling Services

Customer preferences – both intermediary and end users – are shifting away from tangible products and towards services and experiences. Globally the average service-providing manufacturer receives over 30% of sales as services, with expansion into services offerings seen as core to growth by 86% of global manufacturers, largely due to the significantly higher profitability of service based offerings.

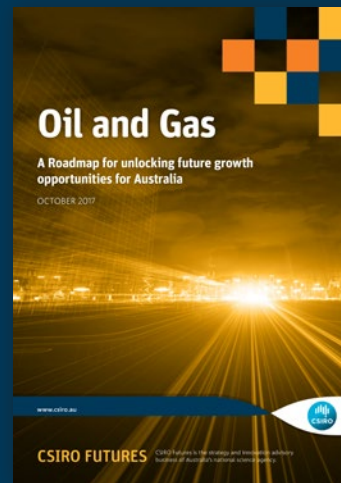
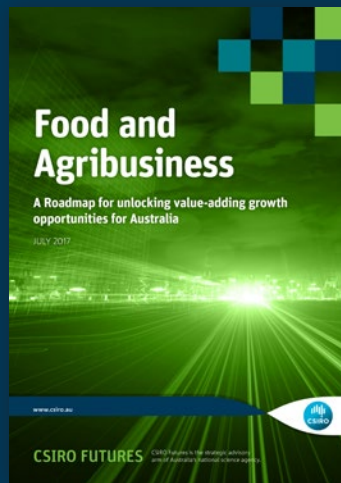
4 Global value chains

With a relatively small domestic market and increasingly globalised manufacturing value chains, Australian manufacturers need to shift their thinking from local to global customers and competitors when strategic planning. Participation in global value chains (GVCs) has been linked with increased innovation; R&D and skills development; collaboration; sophisticated management, financing and technology systems; and productivity premiums. 112 Global interactions also provide businesses with critical exposure to new technologies, processes and skills.

5 Advanced technologies

Sustained growth in the sector will require proactive investment and translation of enabling science and technology. Combinations of sensors and data analytics; advanced materials; smart robotics and automation; 3D printing; and augmented, mixed and virtual reality are emerging as key enablers of future growth.

Read more in the full report:
[www.csiro.au/
Advanced-Manufacturing](http://www.csiro.au/Advanced-Manufacturing)



CSIRO FUTURES

CSIRO Futures is the strategic advisory arm of Australia's national science agency. We work with senior decision makers in Australia's largest companies – and government – to help them translate science into strategy and plan for an uncertain future. We build on CSIRO's deep research expertise to help our clients create sustainable growth and competitive advantage by harnessing science, technology and innovation.

CSIRO MANUFACTURING

CSIRO Manufacturing plays a leading role as Australian manufacturing shifts focus from heavy industry to high tech products based on sustainable and advanced processes. We harness our science and engineering skills, equipment and international connections to keep Australian manufacturers globally competitive.

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We innovate for tomorrow and help improve today – for our customers, all Australians and the world.

WE IMAGINE
WE COLLABORATE
WE INNOVATE

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