



SCIENCE AND
INDUSTRY
ENDOWMENT
FUND



PENRITH
CITY COUNCIL

STEM Community Partnerships Program

Penrith local scenario

Industry 4.0 and changes to the manufacturing industry

The manufacturing industry in Australia has been in steady decline over the past few decades, in part due to imported goods being produced overseas at a cheaper cost. Manufacturing now accounts for approximately 5% of gross domestic product, compared with almost 30% in the 1950s and 1960s. COVID-19 has highlighted the importance of local manufacturing and it remains a vital part of the Australian economy, particularly in Western Sydney. According to the 2016 Census, 7.9% of residents in the Penrith local government area worked in manufacturing (compared with 5.8% in NSW).

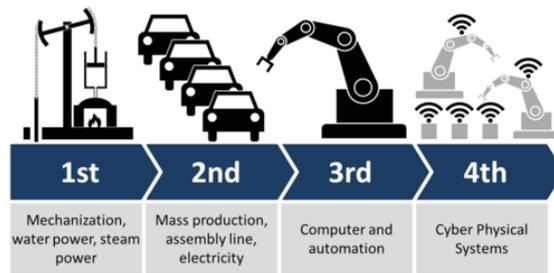
Industry 4.0, also known as the fourth industrial revolution, is the digitisation of traditional manufacturing and industrial practices and the integration across the entire production chain. Ways in which businesses can 'adopt' Industry 4.0 include the use of advanced automation and robotics, artificial intelligence and machine learning, and data analytics and sensor technology.

The adoption of Industry 4.0 enables manufacturing businesses to benefit from greater productivity, as well as address challenges such as labour access and costs, transport costs and distance to market. However, not all manufacturing businesses have embraced Industry 4.0 at the same rate. COVID-19 has highlighted the importance of Industry 4.0 in enabling businesses to respond to disrupted supply chains, worker availability or increased demand, with those who had already scaled digital technologies in a better position to respond to the crisis.

Changes to the manufacturing industry extend beyond simply technological advancements, as businesses have also looked for ways to adopt 'greener' and more sustainable measures as part of their production processes. As the world moves to more sustainable choices, businesses are required to innovate and better utilise their resources and materials, including through the circular economy. For example, by utilising new technologies, businesses can turn their waste into a profit as well as provide cheaper resources to other businesses who can use the by-products and repurpose materials that would otherwise end up in landfill.

Through the Modern Manufacturing Strategy, the Australian Government is focused on helping manufacturing businesses grow, become more competitive and resilient. With Penrith's proximity to the Western Sydney Aerotropolis, it is well equipped to take advantage of opportunities arising from Industry 4.0.

How your Council tackles the complexity of this issue impacts you and your community, now and in the future.



<https://www.auspack.com.au/wp-content/uploads/2017/02/industry-4.0-the-new-reality.png>

Your task

Your task is to use the information above and resources provided below as a start to identify a local problem and design a STEM-focused solution.

(Question, Design, Explore, Communicate)

Resources

CSIRO research

- Advanced Manufacturing Roadmap <https://www.csiro.au/en/Do-business/Futures/Reports/Advanced-manufacturing-roadmap>
- Circular Economy Roadmap <https://www.csiro.au/en/research/natural-environment/Circular-Economy>

Reports

- Industry 4.0, Department of Industry, Science, Energy & Resources, December 2020 <https://www.industry.gov.au/funding-and-incentives/industry-40>
- Australian Government Modern Manufacturing Strategy <https://www.industry.gov.au/data-and-publications/make-it-happen-the-australian-governments-modern-manufacturing-strategy/our-modern-manufacturing-strategy>
- Beyond Business as Usual: A 21st Century Culture of Manufacturing in Australia, Western Sydney University and University of Newcastle, December 2019 https://www.westernsydney.edu.au/_data/assets/pdf_file/0011/1635914/beyond-business-as-usual-a-21st-century-culture-of-manufacturing-in-australia.pdf

Articles and other resources

- Research collaboration with Western Sydney manufacturer, Maxton Fox, to focus on circular economy. Western Sydney University, December 2020 https://www.westernsydney.edu.au/newscentre/news_centre/more_news_stories/research_collaboration_with_western_sydney_manufacturer_maxton_fox_to_focus_on_circular_economy
- New technology diploma to teach 'Industry 4.0' in NSW, August 2020 <https://www.stuartayres.com.au/media/media-releases/new-technology-diploma-teach-%E2%80%98industry-40%E2%80%99-nsw>

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- Australian manufacturing has been in terminal decline but coronavirus might revive it, ABC News, July 2020 <https://www.abc.net.au/news/2020-07-23/coronavirus-pandemic-leads-to-australian-manufacturing-revival/12481568>
- Advanced Manufacturing Success stories, NSW Government <https://www.business.nsw.gov.au/industry-sectors/industry-opportunities/advanced-manufacturing/success-stories>
- Industrial History of the Penrith Region <https://penrithhistory.com/industries/industrial-history-of-the-penrith-region/>
- Penrith City: Industry sector of employment <https://profile.id.com.au/penrith/industries>