



ACARP matters because longwall automation boosts productivity, lowers costs

Underground miners work in a harsh environment facing dust, noise, vibration and other difficult conditions. With the productivity of Australian longwall mining systems dramatically increasing over the past 10 years, exposure to hazards such as respirable dust have worsened. The coal industry believed fully automating the longwall face to the level of on-face observation would improve conditions for underground workers and boost productivity. However, the industry wasn't confident that the original equipment manufacturers (OEMs) could deliver automated systems without an industry-driven, external push. ACARP's Underground Committee believed this initiative warranted a significant investment over several years, which led to the landmark longwall automation project and the delivery of the commercial product LASC.

Industry target

- Improve health and safety conditions for employees working on the longwall face
- Develop a commercial prototype longwall automation system
- Encourage the OEMs to work with industry to provide industry-standard control system and software interfaces between their equipment and technology developed by CSIRO.

Industry investment

- \$6.8 million over five years, plus company funding for trials at Beltana, Broadmeadow and Grasstree.





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Results

- Development of one industry ‘voice’ regarding the direction of longwall automation
- Adaption of the American military’s inertial navigation system from missile and army tank use to installation on a longwall shearer underground (CSIRO Earth Science and Resource Engineering), now also being used in the continuous miner research stream
- Development of a commercial prototype automation system comprising:
 - A shearer position measurement system
 - Automated face alignment (which ensures the correct horizontal alignment of the longwall face)
 - Inertial navigation system-based horizon control (which ensures the shearer’s cutting drums follow the seam accurately)
- Development of longwall automation specifications into the public domain to assist long-term interconnectivity of OEM offerings
- Introduction of LASC into around 50 per cent of existing longwalls for the next round of longwall tender specifications
- Application of the same technologies to continuous miners is under way.

Return on investment

- Improved employee health and safety underground
- Improved longwall production of around five per cent
- Lower longwall operating costs and improved return on capital.