



Cooperative Research Centre for Rail Innovation

Rail transport is vital to Australia's livelihood and economic growth. In the near future, freight transport and urban passenger trips are expected to grow significantly in line with population growth and increases automotive fuel price.

The *CRC for Rail Innovation* (the CRC) is a collaborative venture between leading organisations in the Australian rail industry and Australian Universities and is supported by the Commonwealth Government. The CRC will invest around \$100m in rail industry research over the next 7 years. This makes it the single biggest research program in the history of Australian railways.

During its 7 year lifespan (2007 - 2013), the CRC will seek to transform the Australian rail industry by the provision of world class, collaborative, industry responsive research. It is envisaged that research by the CRC will improve rail's profitability, service delivery, safety, efficiency, employment, and environmental sustainability.

To date, five principal programs have been established by the CRC. They are as follows:

- Economic, Social & Environment
- Operations & Safety
- Engineering & Safety
- Education & Training
- Commercialisation & Utilisation

Dual Role of Rail

The CRC supports the rail industry's position that rail has a dual role to play in positively responding to climate change issues. Firstly, the rail industry accepts its responsibility to improve the environmental performance of its activities. Secondly, the rail industry believes that increased use of rail transport will positively improve environmental outcomes, particularly by reducing the pressure on the environment.

Improving the Environmental Performance of Rail Activities

The rail industry accepts that there are opportunities for improvement in environmental performance by implementing new technology, improving operations and other activities.

It must however be noted that the rail freight industry in particular operates under commercial ownership and in a commercial operating environment. Any increase in cost to rail freight operations will negatively impact on commercial viability and must be passed on to customers or they cannot be implemented. Therefore, transport of freight by rail will be threatened in some circumstances unless there are other

compensating mechanisms or market effects. In such cases freight may be transferred from rail to road transport, resulting in higher environmental impacts, which the rail industry considers clearly undesirable and unacceptable.

CRC Flagship Research Project – Climate Change and Emissions Trading

Currently in Australia rail carries 183 billion tonne-km or 53% of the land freight task and 616 million public transport passengers per annum¹. Transport only represents 14% of Australia's emissions and rail represents only 2.7% of transport emissions. The rail industry believes that rail should be the preferred mode of transport for mass public transport and high volume, long distance freight.

The Rail industry believes that increased rail transport in Australia can result in reduced environmental impacts, fewer deaths and injuries from crashes and health effects, cheaper transport and reduced negative community impacts.

The CRC, in collaboration with and in support of the ARA, aims to be at the forefront of the rail industry's response to the Federal Government on climate change matters including the introduction of an Emissions Trading Scheme (ETS) in Australia.

Climate change topics actively being researched by the CRC in current projects are: *Developing Rail Industry Foresight on Emissions Trading*; and *Modelling of the Australian Transport Sector Carbon Footprint including all Modes of Transportation (road, rail, sea and air)*.

It is envisaged that the report and outputs of initial climate change research projects will be used to inform the rail industry of the issues surrounding the implementation of an ETS for rail, and how rail has an advantage over the other transport modes.

The first stage of the CRC's research project on *Developing Rail Industry Foresight on Emissions Trading* has now been completed and the report has been circulated to industry participants for comment.

In addition, current climate change topics under consideration for early research by the CRC are:

- Emissions Trading Schemes – Cost and Capacity
- Emissions Reduction (The “Green Railroad”)
- Future Fuels for Rail (bio-diesel, hydrogen)
- Electrification of Rail
- Economic Benefits and Incentive Schemes to Optimise Rail Performance
- Upgrading the Network to Allow for North American Class 1 Locomotives
- Economic Analysis for Accelerated Depreciation of Rollingstock and Infrastructure
- Introduction of the “Digital Railroad” vs Additional Track Investment to Create Capacity
- Productivity Increases
- Optimisation of the Rail Network
- Improving Operations and Developing New Technologies
 - Bio-diesel locomotives
 - Hybrid and engine switching locomotives
 - Active energy management and energy use metering

¹ Australian Transport Statistics, BTRE, 2007

- Regenerative energy use
- Anti-idling technology
- Reduced rollingstock wind resistance
- Lighter weight rollingstock
- Improved driver equipment management
- Intelligent condition monitoring and maintenance to improve engine performance
- Improved operational flow to reduce stopping events
- Wheel/rail interface management to reduce friction
- Smart rail lubrication
- Consist management devices

It is envisaged that the outputs of such climate change research projects will benefit both the rail industry and the Australian community as a whole.

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