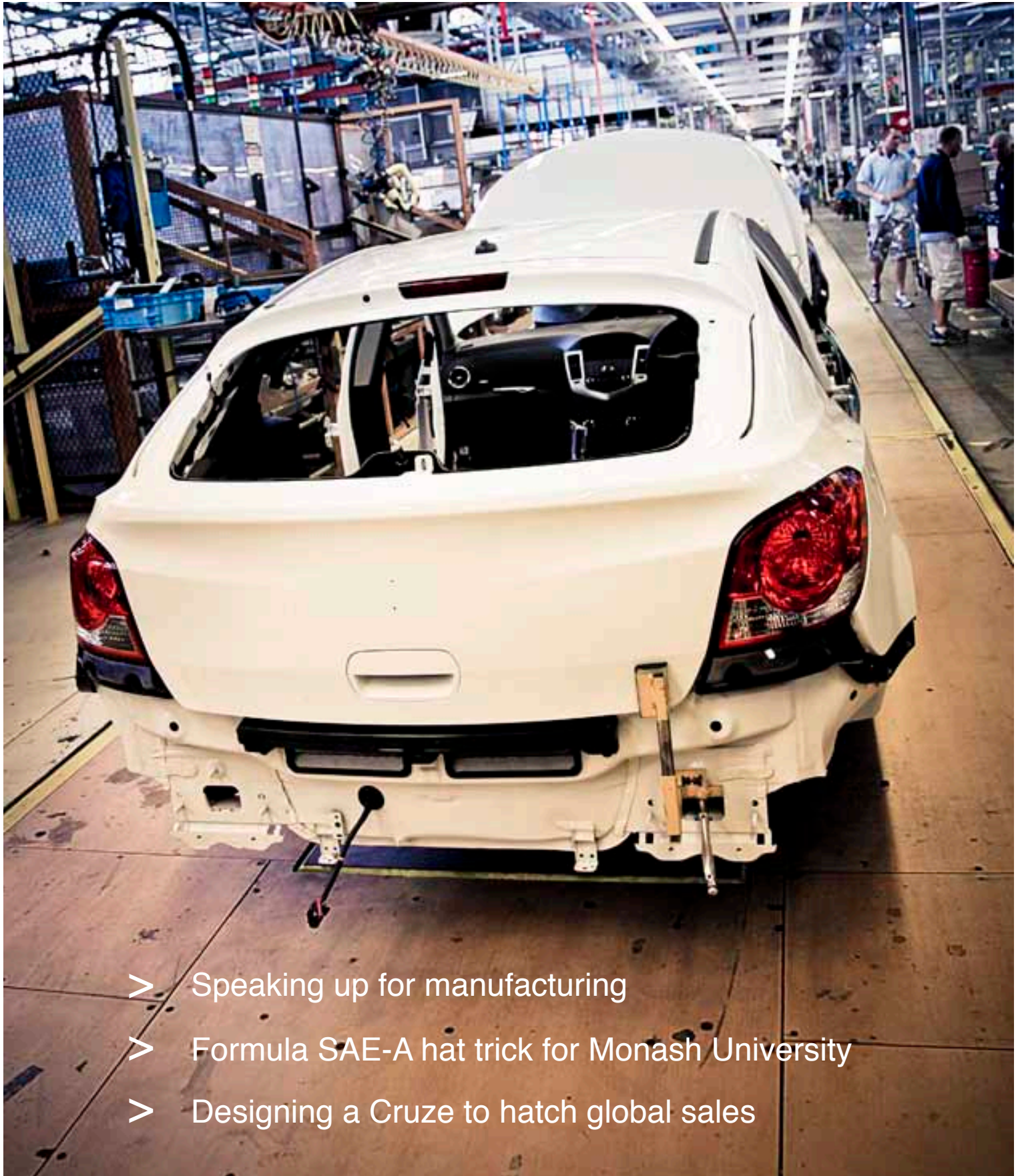


# > AUTOENGINEER

ISSUE 44 JANUARY 2012



- > Speaking up for manufacturing
- > Formula SAE-A hat trick for Monash University
- > Designing a Cruze to hatch global sales

Published by



> Autoengineer is also the official journal of



# SAE-A Publication Order Service

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## Natural Gas Australia: An Automotive Perspective by specialist power train research company ABMARC

Published September 2011

Order No: AB-NGRS1 List \$6,380 > SAE-A member \$5,742  
Additional copies List \$165 > SAE-A member \$148.50

This is the first in a ground breaking new series of reports examining alternative fuels and power trains, and providing insight into potential growth areas for passenger and light commercial vehicles. These reports gives technical and non-technical readers in business and government accurate and objective information that can be relied upon to assist in making critical long term planning, strategic or policy decisions.

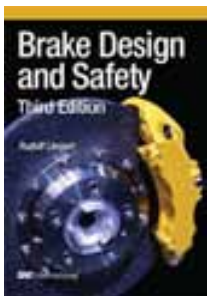
This Natural Gas Australia: An Automotive Perspective report highlights the multiple CNG price regimes that determine vehicle running costs in Australia. Specialist forecasts illustrate the impact of the alternative fuels excise and the proposed carbon tax on transport fuels, and indicate that by mid-2015, the price of CNG will rise to an average of 60% of the running cost of petrol (when fuelled at a service station bowser). While still offering substantial cost benefits to vehicle operators, this would make Australia's CNG to petrol price ratio one of the highest in the world.

The Natural Gas Australia: An Automotive Perspective report provides:

- Comprehensive information on resource availability
- Australian natural gas connection density mapped down to capital city level
- Local and international Government policy review
- Price forecasting, including projections of the alternative fuels excise and proposed Carbon Tax in July 2015
- Detailed analysis of natural gas vehicle systems and operating characteristics
- A comprehensive calculator which allows users to determine the potential benefits of switching to CNG for their specific fleet

Note: the ABMARC Liquid Petroleum Gas Australia report will be available in February 2012, the Electric and Hybrid Report in July 2012, and the Biofuels and Gas Report in December 2012.

**SAE-A members get a 10% discount off List Price for the first report and a 30% discount for the series.**



## Brake Design and Safety, Third Edition by Rudolf Limpert

Published by: SAE International October 2011, 432 pages, Hardbound

Order No. R-398 List \$141.00 > SAE-A member \$126.90 > SAE Joint member \$112.80

The objectives of this third edition of an SAE classic title are to provide readers with the basic theoretical fundamentals and analytical tools necessary to design braking systems for passenger vehicles and trucks that comply with safety standards, minimise consumer complaints, and perform safely and efficiently before and while electronic brake controls become active.

Written for students, engineers, forensic experts, and brake technicians, this book provides readers with braking physics theory and offers numerous illustrations and equations that make the information easy to understand and apply. New to this edition are expanded chapters on:

- Thermal analysis of automotive brakes
- Analysis of hydraulic brake systems
- Single vehicle braking dynamics

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> Prices include GST > Add \$16.50 postage to order. > A credit card fee on total order amount of 2% for MasterCard/Visa and 3% for Amex will apply. > Enquiries to Rose De Amicis on Tue/Wed/Fri.  
> E: [rose@sae-a.com.au](mailto:rose@sae-a.com.au) > F: 03 9696 5865 > T: 03 9696 5190 > P: Level 2, 70 Dorcas St, Southbank Vic 3006 Australia

Australasia Issue 44  
January 2012

Society of Automotive  
Engineers – Australasia  
Suite B, Level 2  
70 Dorcas Street,  
South Bank 3006  
ABN 95 004 248 604  
ISSN 00360651

*Autoengineer Australasia is  
published quarterly as a service  
to SAE-A, FAPM and AutoCRC  
members.*

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*On the cover: Production for the Cruze hatch is underway at the GM Holden plant at Elizabeth, South Australia. GM Holden said local manufacture of the Cruze injects about \$230 million a year into the Australian economy. (See Industry Comments Page 22).*

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# Australian Formula 1 Grand Prix to showcase Formula SAE-A

**Winning teams from the 2011 Formula SAE-Australasia engineering competition will be featured on the race track at the 2012 Australian Formula 1 Grand Prix**

Australian Grand Prix Corporation Motorsport and Entertainment General Manager Craig Fletcher announced the Formula SAE-Australasia addition to the Grand Prix program at the ceremony to welcome the 480+ university students from 23 teams participating in the 2011 competition.

Craig Fletcher said the Australian Grand Prix will welcome the winning 2011 cars on the same track Australian Formula 1 stars Mark Webber (Red Bull) and Daniel Ricciardo (Toro Rosso) will race on. In addition, Formula SAE-Australasia teams will be part of a new education initiative at the Grand Prix to encourage young Australians to consider careers in high technology fields associated with vehicle design, engineering, manufacturing, service and repair.

SAE-A President Bill Malkoutzis welcomed the Australian Grand Prix Corporation's recognition of the important contribution made to Australian high technology design and engineering by this unique event over the past 10 years.

**Australia needs top engineers**

At the opening ceremony GM Holden Executive Director Engineering Greg Tyus encouraged competitors to push the boundaries of technology. He said this competition allows students to work in a team environment facing deadline challenges while optimising their design, just like it happens in industry.

He said Australia needs the best talent in its automotive sector, which is a cornerstone for many other important industries. [See full Formula SAE-A report on page 10.](#)



*Pictured at the launch of the 2011 Formula SAE-Australasia competition were (left to right) Wyndham City Council Deputy Mayor Cr Glenn Goodfellow, GM Holden Executive Director Engineering Greg Tyus, General Manager Motorsport, Australian Grand Prix Corporation Craig Fletcher, and SAE-A President Bill Malkoutzis. The welcome ceremony for 23 universities from Australia, Asia and Europe featured a hot laps demonstration by Swinburne University driver Matt Dwyer in the team's 2010 second place winning car. Image – JJ's Photography*

## 2012 Events Calendar

This events calendar, which is correct at the time of publishing, is provided as a service to help you plan your diary, and includes:

- > SAE-A events for members and non-members. For information T: 03 9696 5190 or visit [www.sae-a.com.au](http://www.sae-a.com.au)
- > FAPM events for members. For information T: 03 9863 2401 or visit [www.fapm.com.au](http://www.fapm.com.au)
- > AutoCRC events. For information T: 03 9948 0458 or visit [www.autocrc.com.au](http://www.autocrc.com.au)
- > ITS Australia events. For information see below or visit [www.its-australia.com.au](http://www.its-australia.com.au)

**January**

24 SAE-A Unmanned Aerial Systems Update, RMIT University

**February**

TBC SAE-A MSE Software,

**March**

5-9 SAE-A Technical Accident Investigation & Reconstruction, Melbourne  
 14 SAE-A, SPE, AutoCRC, LEV Cars of Tomorrow Conference, Australian Automotive Week, Melbourne  
 15-18 SAE-A Driving science - driving the future - Formula SAE-A at the Australian Formula 1 Grand Prix

## New investment in Australian automotive manufacturing

**A \$103 million investment in Ford Motor Company of Australia operations at Broadmeadows and Geelong in Victoria will guarantee local production of the Falcon and Territory models until 2016.**

The announcements follow meetings between Federal Manufacturing Minister Senator Kim Carr and global executives of Ford and General Motors at the Detroit Motor Show in the USA.

Automotive manufacturing directly employs about 60,000 skilled workers and, with about 200 supplier companies, supports a total of about 400,000 Australian jobs. The industry earns export income of about \$4 billion.

Ford Australia President and Chief Executive Bob Graziano said its investment would provide improved fuel efficiency and would reduce the Falcon CO2 footprint by a further 5%. He said this new investment would enable direct employment for about 300 people during the design and engineering phases.

The Federal Government contributed \$34 million from its \$5.4 billion New Car Plan to the Ford investment, while the Victorian Government will provide an undisclosed amount. About \$3.4 billion of the 10 year New Car Plan fund remains to be allocated. Senator Carr said that the level of support offered to the Australian automotive industry by the nation's taxpayers was very favourable compared to international standards. [See Industry Comments Page 22](#) and [Technical Talk Page 26](#).

Announcement of a similar investment in GM Holden manufacturing and design engineering facilities at Elizabeth, South Australia and Port Melbourne, Victoria is expected to develop the 2016 Cruze and 2018 Commodore models.

General Motors Chairman and CEO, Dan Akerson, and Holden Chairman and Managing Director Mike Devereux met with Senator Carr and South Australian Premier Jay Weatherill to discuss General Motors ongoing commitment to manufacturing cars in Australia.

Mike Devereux said: "In the meetings, Minister Carr and Premier Weatherill demonstrated the clear commitment of the Australian and South Australian Governments to maintaining a healthy and viable automotive industry in Australia."



On the Ford stand at the Detroit Motor Show after meetings to discuss the future of Ford Australia manufacturing operations were (left to right) Ford Asia-Pacific President and CEO Joe Hinrichs, Australian Manufacturing Minister Kim Carr, Ford CEO Alan Mulally and Ford Australia president Bob Graziano.

## Futuris Automotive wins SPE environmental award

The US subsidiary of Futuris Automotive has won a Society of Plastics Engineers (SPE) Environmental Excellence Award for its innovative and environmentally friendly enviroTUF PET automotive carpet.

Created to provide a sustainable and cost competitive alternative to traditional automotive nylon carpet, this is the first tufted PET carpet that meets or exceeds automotive industry requirements. The face fibre of the carpet composite can be made from post consumer recycled PET materials and the carpet composites can be 100% recyclable. Futuris has also developed a biobased PET resin that can be incorporated in carpet yarn to extend the use of renewable and sustainable materials for production applications.

Futuris' enviroTUF PET carpet is accepted by many global vehicle producers due to its enhanced performance characteristics, lower cost base (versus traditional tufted nylon) and its sustainability credentials.

## Early Stage Commercialisation grants increased

Changes to funding guidelines mean that Australian entrepreneurs will not have to repay Early Stage Commercialisation grants for businesses developing a new product, process, or service. These grants will be available to more businesses due to an increase in the annual turnover limit from \$20 million to \$50 million.

In addition, growing businesses that can benefit from access to skilled managers now have the option to apply for an Experienced Executives grant of up to \$350,000 – up from \$200,000. The changes are now in place and from 2012 more improvements to support innovation in the manufacturing sector will be introduced.

Visit <http://www.commercialisationaustralia.gov.au/WhatWeOffer/EarlyStageCommercialisation/Pages/default.aspx>

## Australia's Best Cars crowned



The Falcon ECOLPi is the first LPG model to win an Australia's Best Car award from the Australian Automobile Association.

**An LPG-powered Ford Falcon EcoLPi family car has been judged as one of Australia's Best Large Car Under \$60,000 in the Australian Automobile Association's (AAA's) annual awards. It is the first LPG-powered vehicle to win one of the prestigious awards.**

The AAA said the victory is significant because the Falcon tackles a number of key concerns facing consumers in the marketplace - especially in the large car segment. Mark Borlace, chief judge for Australia's Best Cars said LPG is cheaper and burns cleaner than petrol or diesel. "Significantly, it feels exactly like a normal Falcon. If anything, it feels slightly better in that it produces more power and torque earlier in the rev range," he said

Volkswagen was another big winner at the awards, collecting one-third of the awards on offer with five wins. The Volkswagen Polo 66TDI Comfortline was named Best Light Car Over \$20,000, the Golf 90TSI Trendline took out Best Small Car Under \$35,000, the Jetta 118TSI Comfortline was the Best Medium Car Under \$50,000, while the Tiguan 103TDI won Best SUV Under \$40,000 and the Touareg V6 TDI won the Best Luxury SUV Over \$60,000.

New models claiming awards included the Kia Rio Si named Best Light Car Under \$20,000, the Lexus CT 200h Prestige the Best Small Car Over \$35,000, and the Mercedes-Benz C63 AMG Coupe taking out the Best Sports Car Over \$80,000 category.

BMW's 135i coupe remarkably won its fourth consecutive Australia's Best Sports Car Under \$80,000 award and defending their 2010 awards were the Audi A6 TDI Quattro as Best Large Car Over \$60,000, Hyundai iMax as Best People Mover, Kia Sorento SLi as Best SUV Over \$40,000, and Land Rover Discovery 4 SDV6 SE as Best All Terrain 4WD.

Mercedes-Benz snatched the Best Medium Car Over \$50,000 from rival BMW with the C250 CDI Avantgarde taking the prize from last year's winner. This vehicle also won the 2011 Drive Car of the Year Overall Award, the Imported Car of the Year award in Japan and the New Zealand Herald Executive Car of the Year awards. Visit [www.austaliasbestcars.com.au](http://www.austaliasbestcars.com.au).

## New vehicle sales top one million

**The Australian new motor vehicle market staged a remarkable comeback in the second half of 2011 to finish above one million calendar year sales for the fourth time in history.**

Official VFACTS data released by the Federal Chamber of Automotive Industries (FCAI) shows that 1,008,437 vehicles were delivered during 2011. This 2.6% (27,137) fewer sales is attributed to challenging market conditions and significant supply shortages during the year, according to FCAI chief executive Ian Chalmers.

"2011 full year sales are an exceptional result given the effects of natural disasters both at home and abroad throughout the year," he said.

Toyota was the best selling vehicle brand in 2011, with 181,624 sales for a market share of 18%. Holden finished second with 126,095 sales (12.5%) and Ford was third at 91,243 (9%).

Mazda3 was the best selling model, edging out Holden Commodore by 812 vehicles to finish with 41,429 sales. Toyota HiLux was third overall with 36,124 sales, followed by Toyota Corolla (36,087) and Holden Cruze (33,784).

Segments that led sales charge growth were the small car category at 2.1%, Luxury SUV at 22.4% and 4x4 light commercial with 6.3%. Visit [http://www.fcai.com.au/](http://www.fcai.com.au) for detailed statistics.

Ian Chalmers said the FCAI outlook for 2012 was cautiously optimistic. "We predict the market will top one million sales," he said. "2012 will require a concerted and collaborative effort by the industry and government to drive the automotive sector forward. Top of agenda is the need to finalise a CO2 emission standard in this country. We'll also be assessing the impact of carbon pricing from July.

"Significantly, 2012 will be a year to reinforce the pivotal importance of co-investment programs between government and industry in competing for, and winning, important new manufacturing assignments for Australia."

# Thank you Patrick Ross

By Bill Malkoutzis, SAE-A President



**As incoming President of SAE-A, I open my inaugural greeting to *Autoengineer* readers with a vote of thanks to outgoing President Patrick Ross for the hard work, and conscientious service that he gave the Society during the past two plus years. He led the Society through some very difficult times.**

The GFC had a delayed effect on SAE-A. Patrick helped steer us through significant cost reductions in the early days of the GFC in preparation for the industry changes that were inevitable. Without this forethought, the circumstances we find ourselves in today would have been far worse. His leadership ensured that key events could and would be run, even under difficult circumstances.

## Donations

The last few months of 2011 were especially financially challenging. The sudden drop in event attendance was dramatic and unexpected, even though the events presented were of top calibre, with prestigious and relevant speakers. This was due to the industry slowdown that occurred during this time.

While significant reductions in operating overheads were achieved by National Office, overall revenue slowed significantly. Hence a call was made to members to make a small donation to help. Thankfully the membership rose to the occasion and made donations to date of almost \$20,000.

Thus, depending on the financial outcome of Formula SAE-Australasia, which is our biggest event of the year, we expect 2011 to be a near profit neutral financial year. As good as this result is, it leaves little to no legacy of funds for the coming new year.

I want to personally thank every SAE-A member for their donation. In some cases these were very significant amounts, from both individuals and corporate members alike. Your contributions are greatly appreciated and have had a significant effect to the sustainability of the society, and also provided a moral boost for both the board of Directors and the National Office staff.

## Membership fees

The two main income sources for SAE-A are membership fees and event ticket sales. As a not for profit organisation, a neutral financial result is acceptable. However, as we saw in 2011, that leaves little in reserve to allow for market forces beyond our control.

The income projection for 2012, based on existing membership fee rates and sensible event income estimates, was considered marginal. The Board considered a review of membership fees. A benchmarking study of similar professional bodies revealed that SAE-A fees were well below those of most comparable organisations.

The fact that SAE-A has resisted increased fees over recent years, combined with the recent sudden changes within the industry, the difficult and unpopular decision was made to increase membership fees. We hope members will understand to need to cover cost increases.

## Executive Director

By now most of you are aware that SAE-A is advertising for a candidate to fill the Executive Director role in National Office. Max Chanter has served SAE-A well as Executive Director for the past two and a half years and as a volunteer Director and Treasurer before that. He has decided to spend more time with family and will retire when the position is filled. We thank Max for his enthusiasm and support during the transition. We also look forward to his continuing volunteer contribution as a champion for the service and body repair sectors of the industry.

*Bill Malkoutzis report continued***The need for change**

In coming to this role, I recognise a need for change in the Society. We must be better prepared for an uncertain industry future.

The society, in my opinion, first needs to grow its membership base, both at an individual and at a corporate level. Membership growth may be achieved through the broadening of membership demographics to include people with additional skills representing different sectors of the industry. For example, SAE International in the USA defines SAE as a professional body for people in the "mobility" industry. Their membership encompasses aerospace, automotive aftermarket, mining, rail, shipping, trucking and other forms of transport.

We hope that expanding our horizons to these industries and the vehicle importers will more than balance the significant loss of members that were employed by local car and component manufacturers. We also want to expand representation in the service and support sectors of the industry, such as safety research and administration, insurance and the regulatory bodies.

Such wider engagement across industry will make SAE-A more relevant to professional and technical people outside the vehicle producing states of Victoria and South Australia. In conjunction with broadening the membership base, the Society wants to expand its services to provide its new members with professional recognition and development opportunities.

This means stimulating and encouraging the Divisions and in some cases, re-establishing them. It may also mean launching new special interest groups within SAE-A to research and deliver the services wanted. This will take a great deal of research and planning.

**Make your mark in the industry - become an SAE-A volunteer**

We want to engage you - the members - in this work again. In past years we had strong volunteer committees in the Divisions. To rebuild SAE-A, we need volunteer teams on the ground in at least the major centres. We need groups of selfless, motivated members to volunteer their time and services to help to grow the status of your professions or businesses.

Our volunteer Board of Directors and our small National Office team will make as much time as possible available to support this rebuilding.

I believe we can gain great benefits by adding the universities and technical colleges in each region to this mix. Most universities in major centres are already linked directly to SAE-A through the Formula SAE-Australasia engineering education competition ([see Formula SAE-A report page 9](#)). Relationships with educational institutions can help leverage valuable information exchange.

For example, university and college campuses could become focal points for activities with students, graduates, and seasoned professionals and technicians meeting a few times a year to explore new technologies, share student research projects and learn about new service and repair techniques.

Such scenarios will provide broad benefit to all players. It will allow personal development for all involved, mentoring of young engineers, networking for both young and old. I can only see good coming from it. We know similar scenarios have succeeded in the past with some active Divisions flourishing as local SAE-A networks.

Without a great deal of goodwill to bring together all the parties required to make this work again, it will remain just a memory. Please give thought to volunteering to re-energise SAE-A in your area - contact me at [president@sae-a.com.au](mailto:president@sae-a.com.au).

**SAE-A - a champion for the industry**

In parallel to increasing membership and member involvement, another important aspect of our work is continuing to promote the Australian automotive industry. This invariably involves raising the Society's political and media profiles. From the outset, SAE-A has been a committed supporter of the local industry, promoting Australian innovation and technology and lauding the industry's achievements.

The SAE-A was once THE "go to" place for information. We supplied members' expertise to many academic reports and government enquiries. This has always been done on an independent factual basis.

The industry has changed dramatically in recent years - in some cases for the good and not so good in others. There are many special interest groups that try to influence industry and political decision makers. Often this is at the expense of the long term health of our industry.

Our voice must be heard if we want to preserve the core skills that serve our nation well in those key industries of aerospace, automotive aftermarket, mining, rail, shipping, trucking and other forms of transport. The Board and the National Office must invest more time in this important issues management and public advocacy task.

However, sound outcomes will not be achieved with the input of the Board and National Office staff alone. When this group does not have the required expertise, we need the input of informed members to guide us in the management of such issues.

Again, we want to draw on the experience and wisdom of you - the members. We hope you will volunteer to help when next we seek advice on an issue that matches your skill profile.

Having said all this, I suppose my messages to you are simply:

- Expect changes.
- We will need your help.
- Volunteer if you are able to contribute.

Let us hope that 2012 treats our industry - and the Society - more kindly.

# Adapting to the global automotive industry paradigm

By Max Chanter, SAE-A Executive Director



**As we begin the new year of 2012, we reflect back on a tough year that took its toll on SAE-A finances through reduced membership renewals and event attendances.**

There are many facets to operating a not for profit organisation like SAE-Australasia. As members, we are the lifeblood of the Society. As members, we can provide the knowledge and expertise as well as the volunteer time to ensure SAE-A remains a viable and respected organisation.

The elected Board of Directors fulfils a legal commitment and they direct National Office staff by defining policy, setting strategic direction and providing fiduciary oversight. Apart from the two full time and three part time National Office staff, The Society relies on volunteers to contribute to various committees dealing with membership matters, organising events and future planning.

Like the rest of the automotive industry, we acknowledge that the Society must adapt to the new global automotive industry paradigm. What was once a very successful formula is no longer working. Be assured that the Board and the National Office are addressing these challenges. As noted in President Bill Malkoutzis' editorial, we welcome your ideas and encourage you to consider volunteering your skills and experience to progress the Society. ([See page 5](#)).

Due to the generosity of many members, we survived the year and a big thank you to all who made donations. We have made significant cost reductions and we will continue to explore ways to operate leaner in 2012. The finance committee will continue to monitor our performance closely.

Recent events were well organised, but attendances did not meet budgeted numbers, which resulted in reduced income. The Petrol, Diesel and LP Gas Technology conference held on the 19 October was an excellent educational seminar and was highly rated by those attending.

On the 7 November "Plug in 4 Power" electric vehicle conference was held in conjunction with AutoCRC and Swinburne University with international speakers presenting and it included a display of electric vehicles available for sale in 2012.

The Annual Formula SAE-A competition held from 15 to 18 December was an outstanding success, due to the hard work put in by all who contributed to the planning and management of the event during 2011. This competition continues to grow in stature each year. ([See Formula SAE-A report on page 9](#)).

## Looking forward

The SAE-A Committee structure is being revamped with additional volunteers coming forward to assist on the Division Committees in various states and on the National Office Membership and Events Committees.

Planning for 2012 is well under way. Special focus will be working with the Divisions to deliver more activities in the states to provide more opportunities for our members.

The Events Committee is working on a conference called "The Cars of Tomorrow" in conjunction with other organisations and the Victorian Government. This conference will be a feature of Australian Automotive Week to be held in March in Melbourne leading up to the Australian Formula 1 Grand Prix.

As you may be aware, I have resigned from SAE-A to begin retirement, but will continue as Vice President until my term finishes in May 2013. I am happy to remain as Executive Director until a replacement commences and will continue to support various initiatives, which we have put in place and various committees on which I participate.

We have advertised nationally for a replacement Executive Director to enable SAE-A to appoint the best qualified person available. With regret, this is my last Executive Director's *Autoengineer* editorial.

In farewell, I thank all I have been associated with over the last few years for your support, guidance and patience. To the National Office staff I offer another big thank you, because you had to be very patient with me.

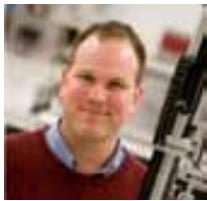
Finally to all members and associates, I wish you all the best for 2012 – may it be a good year for the Australian automotive Industry.

# Vale Fred Thomas

**10 November 1927 - 10 December 2011**

Long term SAE-A Geelong Division and Honorary Life Member Fred Thomas was remembered by fellow members, family and friends at a celebration of his life on 15 December 2011.

# Five minutes with > Christopher Hurren



**What is your title / what organisation do you work for? >**

I am a research fellow at Deakin University.

**Describe the work you do >** We undertake research into textile materials. At the moment I am looking at warmer clothing, needle puncture proof gloves and suture materials for shoulder surgery.

**What do you enjoy the most about the automotive industry? >** I am always amazed by the level of innovation that makes its debut in the auto industry before any other sectors.

**What has been the most rewarding aspect of your career? >** Working with natural fibres like hemp to provide a sustainable alternative to synthetics and cotton. I have also been one of the Technical Inspection team at the Formula SAE-A competition for the last two years.

**What has your association with SAE-A given you? >** A good understanding of the non-textile parts of the auto industry and a wonderful time involved at the formula SAE-A competition!

**What are your leisure time interests? >** Tinkering in my shed, waterskiing, volunteer fire fighting and watching motorsport.

# Member Update

## New members

First Name	Last Name	Member Grade	State
Gary	Beer	Associate Member	NSW
Eduardo	Dela Cruz	Member	VIC
Timothy	Hunter	Associate Member	NSW
Trent	Kendall	Associate Member - T	VIC
Gerald	Kent	Member	VIC
Ng Hua	Kok	Associate Member	Singapore
Catalin	Lospa	Member	WA
James	McKenzie	Associate Member	VIC
David	Milne	Associate Member	WA
Mark	Parsons	Member	QLD
Andreas	Sandvik	Associate Member	VIC
Vic Alpeh	Sanghilan	Associate Member	Singapore
Ho Shi	Yao	Associate Member - T	Singapore
Mohammed Rasul	Yunus	Associate Member	Singapore

## Member Upgrades

First Name	Last Name	Past Grade	New Grade	State
Matthew	Errey	Student	Associate Member	Vic

# Membership Renewals

## NOW DUE

**SAE-A Admin Officer Rose De Amicis reminds members that 2012 renewals are now due and that renewals received after January 31 will incur a late fee of \$15.00.**

Payment can be made by cheque, credit card or EFT. A credit card surcharge fee of 2% for Visa and MasterCard and 3% for AMEX is charged. For EFT payment, please contact Rose De Amicis for bank details > Tel: (03) 9696 5190 or Fax: (03) 9696 5865 E: enquiries@sae-a.com.au

## Upgrade your membership

*"We also encourage members to consider upgrading their membership status. The Society's qualifications are highly valued within Australia and overseas and members' future prospects may benefit by holding the highest grade possible," she said.*

Membership grade is determined by educational qualifications and the level of responsibility in your professional experience.

To apply for your membership upgrade, contact Rose De Amicis on (03) 96969 5190, email: enquiries@sae-a.com.au, or download an upgrading application form

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# Formula SAE-A hat trick for Monash University



By SAE-A Editor Barry Oosthuizen



**The Monash University Motorsport Team stamped its authority on the Formula SAE-Australasia competition by scoring its third successive outright victory in the competition.**

Famous for its winged Formula SAE-A car designs developed in the Monash University wind tunnel, the 2011 Monash University Motorsport team performed consistently across the nine scoring events to take the win with 829.3 points to beat University of Western Australia with a total score of 754.1 and Edith Cowan University on 739.5 points.

Monash University Motorsport defended their 2009 and 2010 Formula SAE-A titles with a lighter car and a more fuel efficient engine. The team won first places in the Cost, Skid Pad, and Endurance events, second place in the Autocross and high scores in the Design, Endurance and Economy categories.

In addition to the outright Formula SAE-A prize, they were awarded the prestigious FISITA (International Federation of Automotive Engineering) Engineering Excellence Award. Monash University achieved all this after facing an "all-nighter" on the Friday to remedy engine problems.

Organised by the SAE-A, the international Formula SAE-A competition is run over the academic year and the scoring events were held at the Victoria University Werribee campus training track near Melbourne from 15 to 18 December.

The Formula SAE-A host company for 2011 was GM Holden and Executive Director Engineering Greg Tyus welcomed 23 teams from universities in all mainland Australian states and from India, Japan, and New Zealand. He said the Formula SAE-A education experience is unique because these 480+ students have worked in a situation reflecting real life challenges.

Greg Tyus challenged every team member to be a winner by maximising this unique learning experience. He congratulated teams for their innovation, hard work and commitment to attend Formula SAE-Australasia. "As host for the 2011 event, GM Holden is proud to support this valuable program. We thank the huge team of volunteers representing our company and many others, who make this event a success every year," he said.

*Outright winner of the Formula SAE-Australasia university engineering competition for the third successive year was Monash University Motorsport. Image - JJ's Photography*



*The University of Western Australia team bounced back to second place outright after a loss of form in 2010. Image - JJ's Photography*

## Educating engineers for Australia's future

Now in its 11th year, this engineering education experience in a race car is part of a prestigious international series of Formula SAE competitions held throughout Asia, Europe and the USA. Competing teams of engineering students design, build, test and compete in small race cars designed to a specific formula and a \$50,000 budget limit.

SAE-A president Bill Malkoutzis said Formula SAE-A has become more than a competitive learning experience for students. "It is a major gathering of people contributing to the industry. They represent educational institutions, car manufacturers, suppliers and the service sector.

"We thank the 150 volunteers, our 2011 hosts GM Holden and supporters Victoria University, Ford, Toyota, Hyundai, Mitsubishi, RACV, Victoria State Government, City of Wyndham, FISITA, and the Confederation of Australian Motorsport. We all combine to deliver this important educational program.

"Formula SEA-A offers young engineers the opportunity to work on a meaningful, complex engineering project, in a dedicated team environment, in real time. This is why 'graduates' of this program are in demand and have been hired by the vehicle manufacturers, parts suppliers, V8 Supercar teams and even Formula 1 teams overseas. They also win jobs in high technology industries outside automotive," said Bill Malkoutzis.

A bonus for the top placing Formula SAE-A teams will be an on track appearance during the Formula 1 Australian Grand Prix in Melbourne announced by Australian Grand Prix Corporation Motorsport and Entertainment General Manager Craig Fletcher. The Formula SAE-A program will also be part of an Australian Grand Prix education program to encourage young Australians to consider high technology careers.



Edith Cowan University delivered a surprise to its 22 competitors with a strong third place outright performance. Image - JJ's Photography

Bill Malkoutzis welcomed the Australian Grand Prix Corporation's recognition of Formula SAE-A's contribution to the industry. "This annual event is a major project for SAE-A, which is a not for profit collective of people working for the benefits of its members and the automotive industry," he said.

Design Patron for Formula SAE-A is former Brabham and RALT race car designer Ron Tauranac and Senior Design Judge is Hyundai Technical Trainer Pat Clarke.

Ron Tauranac said the competition is a huge learning opportunity for the students. He said that in addition to the design and construction process, the teams have a chance to learn from each other and the judges when they come together at the end of the year. "In the judging, we take an educational approach to the task, and after the judging Pat and I revisit teams to workshop their ideas and issues," he said.

The highlights of every Formula SAE-A revolve around the students' achievements. Some years we see teams pushing the boundaries of human patience and perseverance. This year's highlight was listening to the whole crowd cheer every lap completed by the Indian Institute of Technology Roorkee car as it slowly circulated in the last minutes of the Endurance Event. To that team, simply getting on that race track was a win.

## Results

Overall results table for the 23 teams competing in the 2011 Formula SAE-Australasia competition.

For results detail visit [www.sae-a.com.au](http://www.sae-a.com.au)

Pos	Team	Penalty	Cost Score	Presentation Score	Design Score	Acceleration Score	Skid Pad Score	Autocross Score	Endurance-Economy Score	Total Score
1	Monash University	82.9	44.9	160	31.3	75.0	90.9	344.3	829.3	
2	University of Western Australia	47.5	45.2	99	50.0	55.4	100.0	357.1	754.1	
3	Edith Cowan University	65.0	36.8	200	47.5	23.7	76.2	290.5	739.5	
4	The University of Auckland	72.6	50.0	175	8.5	33.5	63.3	240.2	643.1	
5	University of Sydney	59.5	47.7	143	32.8	51.7	48.4	254.8	638.0	
6	RMIT University	67.6	47.0	185	32.3	5.5	65.6	180.2	583.2	
7	University of Wollongong	80.0	46.9	95	36.0	36.4	56.1	198.0	548.4	
8	Osaka University	75.8	37.4	134	40.9	39.3	15.1	184.2	526.7	
9	Curtin University, Perth Western Australia	57.8	39.8	105	49.4	3.5	28.5	218.0	501.9	
10	University of Melbourne	62.3	49.0	120	47.5	47.2	29.4	141.1	496.5	
11	Nippon Institute of Technology	73.2	30.9	97	31.8	48.7	19.6	190.3	491.6	
12	Queensland University of Technology	37.6	43.9	76	34.9	35.4	47.3	213.2	488.2	
13	University of Adelaide	62.9	45.3	94	40.4	28.9	37.4	150.2	459.2	
14	University of Newcastle	55.4	41.2	92	39.2	6.8	6.3	167.9	408.8	
15	University of Queensland	53.7	48.5	98	37.6	37.5	7.5	113.7	396.5	
16	University of NSW - ADFA	77.2	45.7	150	45.7	42.8	5.0	366.5	366.5	
17	University of Technology, Sydney	60.1	38.9	116	43.3	35.8	55.0	349.1	349.1	
18	University of New South Wales	60.2	47.8	138	42.7	28.4	32.0	349.1	349.1	
19	RMIT University - EV	92.5	49.6	146			5.0	293.1	293.1	
20	Swinburne University of Technology - EV	70.7	41.9	101	24.5	3.5	5.0	246.5	246.5	
21	Toyko Denki University	80.7	34.3	126			5.0	246.0	246.0	
22	Deakin University	59.5	42.7	101	22.7		5.0	230.8	230.8	
23	Indian Institute of Technology Roorkee	73.5	38.6	74				186.1	186.1	

# Team Swinburne blitz the track in Japan

By Sean Meldrum, Team Swinburne Business Manager

**Swinburne University Formula SAE racing team finished fourth overall in a field of 87 at the Student Formula SAE Competition of Japan held last September. Team Swinburne entered their 2010 Formula SAE-A car, which won second place in the Australasian competition and took sixth place at the Melbourne Top Gear Live Festival last March.**

Nick named Mr Nosey, this was the last petrol powered car to be built by Swinburne and was the most successful. In Japan, the team won the Endurance Event - a long-term goal of the team, and placed second in the Skid Pad Event, fourth in the Design Event, as well as receiving the Best Rookie Award.

The Japanese Formula SAE event was held at the ECOPA Sports Park in Shizuoka Prefecture in the shadow of Mt Fuji, with teams from Thailand, Korea, India, China, Pakistan, Japan and Australia competing, including five of the top 20 Formula SAE teams from around the world. The event was won by Sophia University from Japan, who finished third at the 2010 Formula SAE-Australasia.

Highlights of Team Swinburne's win were the Engineering Design finals, where the team was praised for its simple yet effective design, its high build quality and the teams' craftsmanship and the strong on track performance.

In the Skid Pad Event (figure eight layout track), driver Matt Dwyer set an incredible time of 5.113sec (a world Top 10 time) putting Team Swinburne in second position.

In the Endurance Event Matt Dwyer and Johnny Rachele blitzed the field finishing nearly 34 seconds quicker than the second fastest car of Sophia University. Matt Dwyer also set the fastest lap of the event with a time of 59.59 seconds. He was the only driver to break the 1 minute barrier, which he accomplished on five occasions during his 10 lap stint!

After a successful 2010 campaign, Team Swinburne thanks everyone involved, especially Kenworth and all the sponsors for making the year possible! It was a great experience for the team and something from which all members learnt an immense amount.

Going forward, Swinburne University is focusing solely on an electric-powered Formula SAE car.



*Team Swinburne Japan included (from left, back row to front) Tim Hammond, Mario Cappola, Dougal Sully, Matt Errey, Jonathan Wolf, Mitch Phillips, Ben Seath, Johnny Rachele, Steve Hunter, Sean Meldrum, Matt Dwyer. Absent: Sean Lewis*

## A future for Formula SAE-A

**Formula SAE-A usually has 25+ competitive teams. This compares with 70+ entries in Japan and well over a hundred in Europe and the USA. The costs to run the smaller Australian event are similar to SAE-A's overseas partners.**

The slightly lower number of 2011 Formula SAE-A entries reflected the ongoing financial issues faced by teams, particularly those from Australasian region universities requiring generous sponsorship to cover transport costs to Melbourne for their team, car and equipment.

The event needs greater assistance from all stakeholders interested in creating high technology outcomes for Australia - academia, business and government. There are many deserving educational programs. Among them, Formula SAE-A is one that delivers immediate practical results - top engineers for Australian industries and exports.

The 2012 Formula SAE-A consortium hopes you will help when called.

**For further information contact: Michela Bartel 03 9696 5190**

# 2011 Formula SAE-A delivers dynamic designs

By Pat Clarke, Formula SAE-A Senior Design Judge

**December to me means Formula SAE-Australasia with the students and then Christmas with my grandkids. Both provide great satisfaction! Each year I am privileged to work with former Brabham design engineer and head of the Ralt Cars company Ron Tauranac, who has the role of Design Patron at this engineering competition for students.**

Formula SAE-A 2011 was one of the most interesting Australian competitions to date featuring a range of different weather conditions. Blustery wet and windy weather made on-track tactical decisions critical as teams tried to get their best drivers on the track at the right times, without incurring the time penalty for running out of order.

For the second year running, the effects of the tight financial situation were obvious. Many teams brought modified versions of last year's car, accepting the Design Event penalties that incurs. These included the 2007 and 2005 Australasian and 2008 USA champions University of Western Australia. They pressed hard to restore pride after a lowly 21st place in 2010 and we believe they could have won the event without this penalty.



Formula SAE-A Senior Design Judge Pat Clarke and Design Patron Ron Tauranac.



The India Enfield EFI500 air cooled single cylinder engine.

## Institute of Technology Roorkee

The second year cars meant many more teams came to the event having tested beforehand. For the first time ever, every car entered at the event ran in one or more dynamic events. The Indian team from the Institute of Technology Roorkee just managed to pass the brake test in time to compete in the second Endurance session. I was interested to see this car run as it was the first time we have seen the new generation India Enfield EFI500 engine in action.

This air cooled single cylinder engine has a unit construction crankcase containing the transmission and is fitted with electronic fuel injection. I have recommended this engine to Indian teams for some years because import regulations there make it virtually impossible for them to source one of the more usual Formula SAE-A motorcycle engine options from Japan or Europe.

The engine is a basic design and somewhat bigger and heavier than the popular Yamaha and Honda units, but it is fitted with a simple management system that permits the user to incorporate the mandatory 20mm intake restrictor. In the event, the EFI-500 ran reliably and used little fuel.

## Monash University Motorsport

Monash won the event for the third successive year with a new car featuring radical differences to previous evolutions. This team really optimised the points return per event to their benefit and were very worthy winners. They changed from a four cylinder engine to an Austrian KTM single and designed a significantly different chassis around it. Sensible and straightforward are how I describe this car. The team also stressed on-time delivery to get the car finished early for an exhaustive test program.



*The strong performance of the Monash space frame chassis demonstrated that a team does not need a complex composite monocoque chassis to win Formula SAE-A.*

At just over 200kg, the car was a little heavy for a "single", but the team willingly accepted this penalty to get the first of this new evolution on the track and ensuring it was reliable. Very sensibly, they reasoned that the time lost accelerating an additional 20kg or so around the track could easily be nullified by testing and chassis optimisation.

The 2011 FSAE rules relaxed the limitations on aerodynamic devices and Monash took full advantage. Again, they mounted their wings "live" meaning the aero download is fed directly into the tyres rather than via the chassis.

Pre-event research had the team change from their more usual Avon tyre choice to Goodyear. They also abandoned the spool drive system used in their previous two winners for a German Drexler clutch type limited slip differential. Both these decisions were made after investigation showed a points advantage over the entire spread of dynamic events.

On track, the Monash car was awesome - arguably the fastest car there, and in my opinion, probably one of the fastest Formula SAE cars in the world! This team was one of the four Design Finalists and scored well in all other events. I was personally pleased to see the Monash win because it demonstrated that a team does not need a complex composite monocoque chassis to win in Formula SAE.



*This view of the Monash Motorsport car shows how the aero download generated by the wings is fed directly to the tyres and the Drexler clutch limited slip differential system.*

## Design Event finalists

Other Design finalists were RMIT University, University of Auckland and the Design winners Edith Cowan University from Perth. The RMIT and Auckland cars were similar in concept - small composite chassis powered by 450cc single cylinder Yamaha engines with RMIT on 10 inch wheels and Auckland on 13s.

RMIT retreated from their twin cylinder adventure last year and the results showed it. They won the Fuel Economy event and second place in Design, backed up with good performances in other events led to sixth outright.

Technically, the Auckland car was the more interesting. To effectively run a narrow track and reduce the yaw inertia as the car negotiates the slalom sectors of the circuit, the team re-engineered the power train to lower the c/g. They designed a transaxle system to replace the more normal chain drive arrangement (as used by the RMIT car).



*The University of Auckland team experienced pit lane jitters when chasing a hard start problem.*

Design winning team Edith Cowan University brought the other car with big wings. In the case of ECU, however, the wings were mounted to the chassis rather than the suspension. On the track, one could see that their system needs more chassis setup development because the car was "porpoising" quite a bit.

The ECU car was also technically interesting. A simple folded composite main chassis mated to a space-frame rear section to carry the engine. The Honda CB600R engine was the only four cylinder engine in the Design Finals, an indication of how the competition has changed in recent years.

The standard of fit and finish was very high and the students really understood the design decisions they had made. The judges had reservations about a couple of aspects of the car. Maybe it is about 10kg too heavy, some questions asked about feeding the braking torque into the monocoque structure, and the fact the aero package was "added on" rather than "designed in". Having said that, this reasonably inexperienced team were very competitive on track and, along with their good performance in the static events, they finished in third place overall.

In each of their three years attending the event, ECU has had an historic theme presenting their cars in JPS and Gulf Oil liveries. This year, the team paid homage to the Brabham marque, in particular the 1966 BT19 World Championship winning car, although Design Patron Ron Tauranac (the ex Brabham and Ralt Cars design engineer) was not enamoured with the big wings. However, he did admire some of the impeccable engineering in the car.



Swinburne's electric car passed the tilt test - one of the rigorous safety checks conducted before vehicles are allowed in the dynamic events.

### Japanese entries

There were three visiting teams from Japan, our old friends from Tokyo Denki with the latest iteration of their lovely little Honda powered space frame car running on 10" tyres, along with entries from Nippon Institute of Technology and Osaka University.

The NIT car, looking a little like an orange coloured Tokyo Denki, was powered by a 500cc twin cylinder Yamaha engine driving through a CVT transmission.

The Osaka car, painted in Kawasaki acid green and powered by a 600cc four cylinder Kawasaki Ninja engine, sounded like it had been tuned for absolute power rather than driveability and economy. The engine didn't want to idle under what sounded like 8,000rpm and the rear sprocket was probably the biggest I have seen on a FSAE car.

Not unexpectedly, they ran out of petrol about 100 meters from the end of their enduro run, but managed to finish on the starter motor, to the delight of the onlookers.

### Electric vehicles on track

Two electric cars ran at Formula SAE-A and while both cars performed adequately, they were never a threat to the internal combustion engine racers with RMIT EV finishing in 19th place and Swinburne EV 20th.

RMIT ran an electric vehicle as the University's second entry and this was the third car produced in the team's electric program. The car was similar to their IC car, but powered by two electric motors, permitting torque vectoring.

Swinburne University have abandoned their successful IC Formula SAE-A program to pursue an electric program. This was their second EV and was simpler than the RMIT car, being powered by a simple single motor, though the team had reworked it in a quest for more performance.

### Interesting engineering observations

University of Western Australia turned up with some interesting wheel fairings. The technical inspectors challenged the legality of such fairings on an "open wheel" vehicle, as required by the rules. The team were politely asked to remove them and they complied. They later test drove the car with the fairings fitted.

Veteran driver Pete "The Pirate" Marsh was devastating on track, fairings or no fairings, pulling the team up to a second place overall finish. I expect to see some big changes in this team next year, probably another heavyweight team to go down the "single" route.

Spool drives remain common, although previous spool user Monash abandoned theirs for a Drexler clutch type LSD. It is easy to be dismissive of spool drives as a low buck solution.



The Innovative front wheel fairings fitted by the University of Western Australia were challenged by judges.

However, in Australia this is not quite the case. V8 Supercars use a spool and in many cases the students are willing to use this solution in order to gain experience that may help them obtain a job in V8 racing.

Personally, I have no objection to a spool as students must further their understanding of vehicle dynamics in order to make one work.



The straightforward spool drive system fitted to the University of Newcastle car.

Ron and I congratulate the 2011 teams for their commitment and creativity. It was a good year for innovation - and most importantly, all teams reached at least one on track event.

# The people behind the scenes at Formula SAE-A

By Adrian Feeney, Formula SAE-A Event Coordinator

**Formula SAE-A began in 2000 when SAE-A formed a Consortium of companies, which then included Ford, Holden, Toyota and Mitsubishi. Ford hosted the inaugural event and those companies each took a turn as host, using their proving grounds and predominantly their staff to run the event. This proved both difficult from a logistics and cost point of view for the host company.**

In 2004, we based the event at the Victoria University Werribee campus. The organisation of the event has evolved and the basics don't change year to year, but we fine tune things as required. The Consortium manages the operations in concert with the SAE-A National Office.

## Consortium leaders

The key players representing Consortium companies are Bob Tilbury (Ford), Mark Morarty (Toyota), Rob Chadwick (Mitsubishi) and I represent Holden. While voting rights remain with these members, others share the workload, including Jason Smith (Ford), Steve Castles (Toyota) and Mark Doody (Holden). David Ford (SAE-A) and Pat Clark (Hyundai) lead the rules committee and Prof Harry Watson is university liaison.

A year is invested in preparing this event and the demanding host role is now rotated annually between Ford, Toyota and Holden. Monthly Consortium meetings are held and the major operational tasks are done in the week before the event. That is when we turn areas of concrete and bitumen into a fully functional competition environment with pits, skid pan, race track, toilets, fresh water supply, electricity, a class room or two and an admin centre. We set up the Cost, Design and Presentation events in large buildings near these temporary facilities.

The Victoria University training track is morphed into a simulated race track with twists and turns only a crafty Clerk of the Course (Rob Chadwick) could dream up. The host company provides the labour to set up safety fencing and barriers.

One of the most satisfying aspects of the week is to see some of our finest high level executives roll up their sleeves to drive star pickets into the ground, lay out electric cables, set up portable toilets and do other manual tasks. Corporate rank counts for nothing and there is no point complaining, because everyone is too busy to listen!

Additional help in the past has come from stalwarts, such as David Adams, Rob Allen and James McDonald.

## Event Captains

The next organisational layer manages the individual events. The 2011 event captains included Cost (David Ford), Design (Mark Morarty and Alan Thompson), Electric Design (Jeff Brown), and Presentation (Bob Tilbury). Over the years others, such as Luigi Deluca, Anthony Pierce, Wil Vanderwerf, Steve Deakin, Alan Thompson, Chris Hurren, and Roger Broughton have fulfilled these roles.

To me, these are the real champions of the event - they make the actual event happen and have the most interaction with the students. They also have divided opinions about which event is the most relevant test of engineering ability.

Mark Morarty says only the Design Event matters and everything else supports it. David Ford loves to dig deep into the Cost Event reports to find hints of misplaced decimal points. Bob Tilbury thrives on the enthusiasm of the young engineers selling their skills in the Presentation Event.

Each team must pass a Technical Inspection and a series of tests (Tilt Table, Brake and Noise) before they are allowed on track. Quietly spoken Chief Scrutineer Luigi Deluca has a wealth of experience in that role and it is a pleasure to watch him patiently step students through any compliance issues.

Once on track, the teams are in the hands of highly respected Clerk of Course Rob Chadwick. To see him under pressure is a lesson to all - he stays calm, considers the facts and makes a decision that is deemed right by him. He is supported by trusty Assistant Mark Doody, and Roger Broughton does the scoring.

To support these people, we have up to 150 volunteers who contribute as track marshals on the three competition days. It is an interesting mix of experience and new talent that help, all united for one purpose - to enable the students to demonstrate their skills as young engineers. (Actually there are two reasons to volunteer if you count the free polo shirt!)

This committed team delivers a world class event every year. We look forward to your support at future Formula SAE-A competitions - to keep Australian automotive engineering at the forefront!



Volunteer Formula SAE-A Stalwarts Rob Chadwick, Adrian Feeney and Mark Doody.

# AutoCRC funded for five further years



By Dr Matthew Cuthbertson, Chief Executive Officer, AutoCRC

It has been an extremely busy year at AutoCRC, with a number of notable research highlights, many of which have been profiled in our recent contributions to *Autoengineer*. The achievements of 2011 were topped off with the announcement in November of a further \$26 million of Commonwealth funding over five years. This will enable AutoCRC to continue acting as a hub of innovation in the automotive industry.

The funding indicates a clear acknowledgement from the government that the outcomes of the current AutoCRC have met expectation and also that the research themes for the new Automotive Australia 2020 CRC are seen to have significant benefits for Australia that are closely aligned with government priorities.

The new funding opens the door for AutoCRC to enable collaboration and to pursue positive outcomes in the following key research areas:

**Vehicle Electrification** - To position the Australian automotive industry in key elements of the global trend towards electric vehicles, particularly with battery technology and advanced EV and hybrid drive trains.

**Gaseous Fuels** - To address technological and social barriers to the uptake of gaseous fuels in cars and trucks in the research themes Uptake of Alternative Energy for Transport and Fast-fill High Capacity Storage Solutions.

**Clean21 Manufacturing** - To make the Australian automotive sector cleaner, more efficient and enable it to produce greener vehicles and components more effectively.

These priorities are based on the findings of the Automotive Australia 2020 Technology Roadmap and outcomes will be achieved by connecting Australian researchers and companies (particularly SMEs) with ambitious international organisations.

This ensures that Australian products and know-how from Automotive Australia 2020 CRC are immediately integrated into high growth supply chains, in turn leading to further investment and jobs for Australia.

The new CRC will have a different participant mix, with an international flavour which combines some of the current participants and a number of newcomers. The industry and research participants are listed below.

In the meantime, as we in AutoCRC gear up for another busy and productive year, it remains only to thank all our existing and new participants, and everyone that has supported us over the last six years. We wish you a prosperous and successful 2012.

View the Automotive Australia 2020 Technology Roadmap: [www.autocrc.com/2020.htm](http://www.autocrc.com/2020.htm)

View Automotive Australia 2020 CRC info: [www.autocrc.com/AutomotiveAustralia2020CRC.htm](http://www.autocrc.com/AutomotiveAustralia2020CRC.htm)

## Automotive Australia 2020 CRC Participants

### Industry and end users

Advanced Composite Structures Australia  
 Bao Iron and Steel Co Ltd (China)  
 Blade Electric Vehicles Pty Ltd  
 CAP-XX (Australia) Pty Ltd  
 Chargepoint Pty Ltd (Australia)  
 Cryoquip Pty Ltd (Australia)  
 Department of the Premier & Cabinet SA  
 DLG Energy Pty Ltd (Australia)  
 EDay Life Pty Ltd (Australia)  
 Ergon Energy Corporation Ltd (Australia)  
 Futuris Automotive Interiors  
 GM Holden Ltd  
 LPG Australia  
 Malaysian Automotive Institute  
 Megabond (Huangshan) Adhesive Co Ltd (China)  
 Redarc Technologies Pty Ltd (Australia)  
 SAMMITR Motor Group (Thailand)  
 SMR Automotive Australia Pty Ltd  
 Toyota Motor Corporation Australia Ltd  
 Victorian Centre for Advanced Materials Manufacturing

### Research organisations

Commonwealth Scientific & Industrial Research Organisation  
 Deakin University  
 Kangan Institute Of TAFE  
 Queensland University of Technology  
 Royal Melbourne Institute of Technology  
 Swinburne University of Technology  
 The Australian National University  
 The University of South Australia  
 University of Technology Sydney  
 University of Wollongong  
 Victorian Partnership for Advanced Computing Ltd

# Reaching down the supply chain

By Linsey Siede, Director, Automotive Supplier Excellence Australia



**Round 1 of the Automotive Supply Chain Development Program (ASCDP) finished on 31 December, so it is an excellent time to reflect on the past 20 months.**

The ASEA team is completing closeout meetings for the last few remaining projects undertaken since March 2010. As well as completing many internal

projects, participating companies will have completed 152 projects with ASEA, all of which were identified during the company-wide Initial Assessment and were detailed in the Benchmark Report and Improvement Plan Book.

The comprehensive assessment process used by ASEA to identify where improvement opportunities exist for participating organisations is also used to document where there are best practices in place. ASEA greatly appreciates it when those companies agree to share their best practices with their peers. We have been honoured to host Best Practice Visits (BPVs) at Australian Arrow, Bosch - Clayton, Bosch Chassis Systems, Continental, FMP Bendix, and Unidrive in Victoria, and at Hirotec and Toyota Gosei in South Australia.

With funding now approved and announced for Round 2 of the ASCDP (which actually commenced on 1 July 2011), the ASEA team has been doubly busy with not only completing the Round 1 activities and milestones, but with simultaneously ramping-up Round 2.

As part of Round 2 of the ASCDP, ASEA has recently undertaken some very interesting work to try and better understand the complex linkages and intricacies of the Australian automotive supply chain, and try to identify potential "key" Tier Two and Three suppliers.

Tier One suppliers were asked to confidentially provide ASEA with the names of and size of purchase from their Top 10 Australian based suppliers, which could be for product, services or tooling.

The thought process was to consolidate the purchase amounts by Tier 2/3 companies and to generate a pareto listing from maximum to minimum dollar amount of product/service supplied to the Tier One companies with those at the top being "key".

## Research reveals supplier scenario

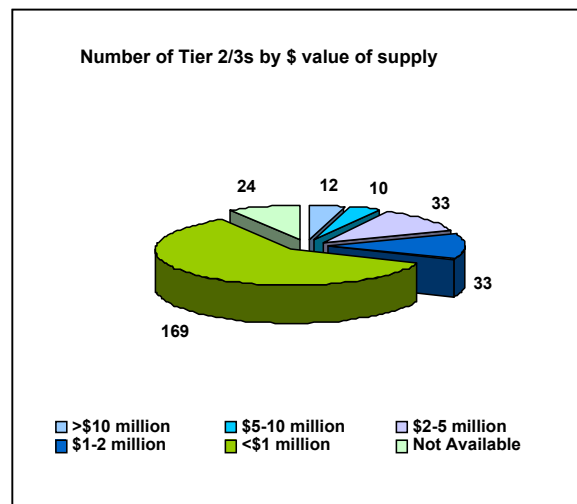
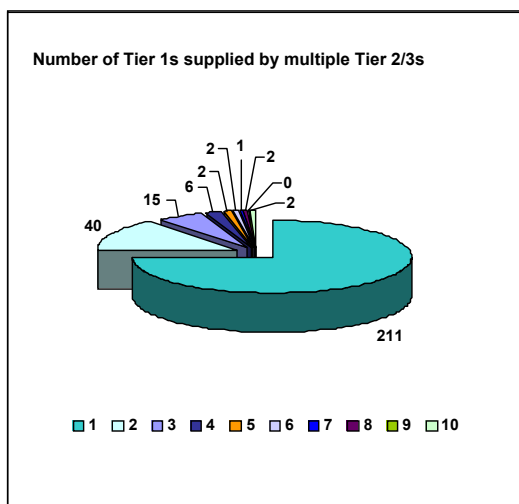
However as the information began flowing in, a second picture began to appear. It became more and more obvious that a small number of Tier 2/3 suppliers were supplying a number of Tier One companies, and were equally (if not more) "key" than those supplying large dollar amounts.

Mapping the connections between companies within the supply chain also identified a considerable overlap between Tier 1 and Tier 2 providers, with many Tier 1 companies also being important Tier 2 suppliers. Due to the confidential nature of the data provided, I cannot share the details, but the consolidated results were too good not to share.

If we examine the data and look at the number of Tier 1 companies supplied by each Tier 2/3 company, the results become even more segmented. A whopping 75% of the Tier 2/3 companies listed supply only one Tier 1 company and an incredible 89% supply two or less Tier 1 companies. Conversely, there are a handful of companies that supply 7 or more Tier 1s, which by default makes them "key" to the industry.

Looking at the consolidated results of the information received in this study by dollar amount, we find that of the 274 different Tier 2/3 suppliers listed, only 12 supply more than \$10 million to the Tier Ones. A huge 163 (59%) supply less than \$1 million. Unfortunately, due to a few Tier Ones that did not provide dollar amounts, there are 24 that we do not know about. However, by far the majority of the Tier 2/3 suppliers (72%) supply less than \$2 million to the Tier 1 companies.

The ASEA Team are looking forward to cascading the Round 2 program further down the supply chain, by working with more Tier 2 and 3 suppliers over the next 18 months.



# The new Automotive Australia 2020 CRC

**As mentioned in Matthew Cuthbertson's report (see page 16), the AutoCRC team was delighted to receive the news in November that AutoCRC has received \$26 million to fund projects benefiting the Australian automotive industry over another five years.**

On a practical level, this means completing the wrap up tasks associated with the current CRC (The Co-operative Research Centre for Advanced Automotive Technology) and also investing significant resources and effort into establishing the new CRC (Automotive Australia 2020 CRC). Important parts of this work are keeping the new participants involved in the set up process and finalising the research and education programs.

The AutoCRC has received a lot of questions regarding the name of the CRC, and can confirm that the short name AutoCRC will be retained. In addition, the new long title Automotive Australia 2020 CRC will be used to ensure the organisation is clearly aligned with the key research priorities identified in the Automotive Australia 2020 Technology Roadmap.

The cut off point for the current CRC is the 30 June 2012 and the team is working to ensure that all the necessary tasks are completed to hand over project management responsibilities and intellectual property to existing participants.

Although 1 July marks the start of a separate funding period, there have been some massive breakthroughs and achievements in the current CRC. These will be built on in new projects, along with some new research directions.

Watch this space for more information over the coming year and keep up to date on new developments by visiting [www.autocrc.com](http://www.autocrc.com), or the AutoCRC Facebook page (see link on the website homepage).

The AutoCRC team thanks everyone for the massive amount of support received to get this far. The team is excited about the opportunities the new funding presents and looks forward to working closely with many of you *Autoengineer* readers

## Undergraduate program student research awards

**The AutoCRC undergraduate program completed the year recently with a poster and presentation session at Toyota head quarters in Port Melbourne. About 40 students took part in the program this year, which aims to provide a link to industry and produce employment ready graduates with the relevant skills to pursue a successful career in the automotive or related industries.**

Students were asked to produce a poster for the final session and our panel of three judges from AutoCRC, GM Holden and Swinburne University elected four project groups to give final presentations.

Michelle Ng of Monash University particularly impressed judges with her professionalism and oral presentation on research with GM Holden "Seamless Integration of Electrical Aftermarket Accessories into a Vehicle". Her enthusiasm and commitment was rewarded with first place in the awards.

The AutoCRC congratulates her and all students who participated in this innovative program, which produces practical learning outcomes for them and for the industry.



*Michelle Ng of Monash University received first prize in the AutoCRC Undergraduate program from judges Ian Christensen, General Manager, AutoCRC and Steve Curtis, Vehicle Structure and Safety Integration Manager, GM Holden.*

# Using waste heat to generate new power

By Jacqueline King, Knowledge Manager, AutoCRC

**As we move towards an increasingly electric automotive future, the hunt is on to find efficient ways of producing clean electricity to power our vehicles and more. A creative solution from AutoCRC researchers allows companies to generate their own clean source of electricity at a significant cost savings – an attractive proposition given sharply rising electricity prices.**

Many companies produce heat in the process of manufacture. A large percentage of this heat is usually allowed to escape through chimneys, which is both wasteful and expensive. Due to rising energy prices and the growing concern over climate change, many companies are now seeking new ways to reduce their costs.

An AutoCRC project involving the collaboration of RMIT University and Air International Thermal Systems has developed a way to capture waste heat and use it to generate usable electricity.

The system uses a method similar to a refrigerator in reverse. It turns liquid into steam, which in turn drives a turbine and then cools the steam back into a liquid before going around the circuit again. The turbine is the only moving part, and the generator requires no power other than the waste heat itself. As no new electricity or fuel is required, the electricity made using the waste heat is emissions-free.

The idea of capturing wastage energy is not new. However this new technology has been designed to work at lower temperatures - less than 100°C. This has been a huge advancement over previous generators, which needed temperatures of 300°C or more to operate, thereby making the new technology accessible to a much larger range of industrial plants.

A prototype was developed to encourage development of this new generator of zero-emissions electricity. Market research funded by the AutoCRC showed that the potential market for the new generator was very large and spread across a range of sectors, such as cement-makers and paper manufacturers.

As a result of this research and development work, the new company g-T Energy Technologies (gTET) was formed to take the technology to a commercial level by producing a range of efficient and cost effective generators for industrial use. gTET has already engineered generators to produce 25kW and 150kW and has almost finished development of a 500kWh unit due for release in July 2012.

The first gTET generators have also been designed so that the smaller-capacity units can be contained inside a standard shipping container making transportation much easier. Installation then involves a simple turn-key process, making the generators ideal for applications such as sawmills and other remote industrial sites. The larger generators under development can be integrated into a permanent industrial plant.

One of the most important advances made by gTET lies in the combined turbine/generator unit that incorporates a unique form of gas bearing, which uses an ultra thin cushion of high pressure air between the rotating shaft and the metal carrier on which it spins. Unlike earlier gas bearings, the gTET version does not need an air pump. This reduces the complexity and therefore cost of the generator.

As a young company still raising capital to fund its operations, the company's directors decided not to build a factory. Instead, the company has contracted an existing heavy manufacturer to produce the units, thereby creating new jobs and helping to use some of the excess capacity in the local engineering industry.

gTET estimates that a commercial customer paying 10c/kWh for electricity can expect to recover the cost of the gTET generator within three years. With the introduction of carbon pricing and Australian Government offering support and incentives for industry to move to more energy efficient technologies, these generators are a timely invention that will deliver economic and environmental benefits to Australia.

Visit [www.g-tet.com](http://www.g-tet.com) for more information.



*Prototype generator built by RMIT University and Air International - an AutoCRC collaboration*

# Successful Parliament House Friends of Manufacturing events



By Richard Reilly, Chief Executive Officer, Federation of Automotive Products Manufacturers

**You may recall in the last edition of *Autoengineer* I discussed the FCAI Friends of Manufacturing events held in August 2011 and flagged that FAPM was proposing to hold similar events later in the year. Well, we did.**

On 24 August 2011, FAPM hosted two events in Parliament House, Canberra, under the Friends of Manufacturing banner. The purpose of these events was to continue to reinforce the message that our manufacturing industry in general, and the automotive sector in particular, were key parts of the Australian economy, and that this is an industry which is just 'too important, too vital and too strategic' to let go.

A breakfast was hosted by FAPM and federal shadow industry minister Sophie Mirabella, and attracted more than 55 people, with Coalition politicians and advisers joined by many parts of the Australian automotive industry. The vehicle manufacturers, FAPM members, the FCAI, government officials and interested parties all participated.

A lunch hosted by FAPM and the Member for Wakefield Nick Champion was held for government members. In Nick Champion's outer Adelaide electorate are GM Holden and a number of their suppliers. We were also very pleased that Manufacturing Minister Kim Carr spoke at this lunch and he well set the scene on the importance of the manufacturing sector in Australia.

*A really powerful message was delivered by FAPM on the size and importance of our sector of the manufacturing industry. We highlighted the global nature of the automotive industry and how governments worldwide are doing their utmost to either keep their automotive industries viable through a co-investment regime, or through a tariff regime (and sometimes both) or seeking to attract automotive investment into their countries.*

We built on the FCAI message and showed that the level of government assistance to our industry is not competitive compared to the key automotive markets around the world. We emphasised that if the Australia automotive industry is to remain viable and be positioned to compete globally, not only with vehicles, but through the export of components, there must be a more realistic and internationally competitive level of government support to the industry.

We gave a full account of our industry – both where there were challenges and where there had been positive developments. We acknowledged that things were tough in the industry. We explained that the combination of falling domestic production volume, industry/government co-investment levels that were no longer globally competitive, and a sustained high Australian dollar coupled with non reciprocal international automotive market access for the local industry were really testing the resilience of Australia's supply chain.

There was also good news we imparted. The government's New Car Plan for a Greener Future had registered some really positive results. The Green Car Innovation Fund, prior to its abolition, had funded various new R&D and investment proposals, not least of which was funding for the localised Holden Cruze and the introduction of Nexteer's leading edge technology associated with steering and driveline systems.

The Automotive Transformation Scheme (ATS) is now a year old and continues to encourage R&D and facilitate industry investment. The pleasing aspect of the ATS, particularly in light of the demise of the Green Car Innovation Fund, is that there is certainty around the program until 2020. By definition, this gives component makers a high degree of confidence when making investment decisions.

Similarly the Automotive Supplier Excellence Australia (ASEA) program has received over \$4 million in grant funding to improve the global competitiveness of Australia's component suppliers and assist them in achieving international competitiveness and sustainability. (See [ASEA report 17](#)).

## FAPM Board members

The FAPM annual general meeting was held on 30 November 2011. The meeting passed a new Constitution that will assist the organisation in modernising and adopting a number of best practice reforms.

A new Board, with member numbers reduced to nine people, was elected. We welcome new Board members and thank them all for volunteering their time and energy to the organisation:

- Jim Griffin – Diver Consolidated Industries
- Shiromi Brell – Bluescope Steel Limited
- Gary Layton – ICOA Pty Australia Ltd
- Mark De Wit – Futuris Automotive Group Ltd
- Greg Lowe – TI Automotive Australia
- Robert Wilson – Palm Plastics and Tooling
- Barry Comben – Harrington Industries
- Russell Jopson – Denso Automotive Systems Australia Pty Ltd
- Bruce Griffiths – Air International Thermal (Australia) Pty Ltd

The new FAPM president and vice-president will be elected by the Board at its first meeting in 2012.

## 2012 FAPM National Conference

**Date claimer - 9 & 10 August**  
**RACV Country Club**  
**Healesville Yarra Valley, Victoria**

We are excited to announce that the venue for the 2012 FAPM National Conference will be the RACV Healesville Country Club in the beautiful Yarra Valley, near Melbourne.

The national office team is now planning the event and as always, the conference will bring together FAPM members and key industry stakeholders to discuss the critical issues facing our industry.

While the actual theme headline is not finalised, it will reinforce the “too important, too valuable and too strategic” message delivered at our Parliamentary Friends of Manufacturing events - as per below.

Please put the date in your diary. We look forward to your active participation in the 2012 Conference!



# Speaking up for Australian manufacturing

In a televised address at the National Press Club of Australia on 7 December the outgoing President of the Federal Chamber of Automotive Industries (FCAI) Mike Devereux said that Australia stands at a fork in the road and must invest in the nation's capability to design, engineer and build if we are to be a diverse and strong knowledge economy.

Mike Devereux, who is Chairman and Managing Director of GM Holden, said a healthy automotive manufacturing industry is a key driver of innovation and national strategic capability. He made a strong case for Australia to be made a more attractive investment opportunity for manufacturers. The FCAI represents both Australian car manufacturers and importers.

This is an edited summary of Mike Devereux's speech, which focused attention on how countries compete for the benefits brought by vehicle manufacture. Since this speech was delivered, Manufacturing Minister Kim Carr has visited top Ford and General Motors executives at the Detroit Motor Show to negotiate their commitment to Australian manufacturing. (See News in Brief page 3).

In his opening remarks, Mike Devereux cited the story of Amazon's Kindle digital book reader invention, which was developed in the USA, but could not be manufactured there. It is now produced in Taiwan because the USA has surrendered the technical capabilities required to manufacture it.



"That is the future we're contemplating. There is more to the Kindle story than 'you don't know what you've got 'til it's gone'," Mike Devereux said.

*"By ceding these industries to other countries, we aren't just losing today's manufacturing jobs, we're losing the production of tomorrow's innovations, on the progeny of the products being built today. If we give up manufacturing capability in this country, we mortgage our future for things that we cannot even imagine today."*

"A first class education system and the ability to build high-tech, value-added products like cars I believe are some of the building blocks to this knowledge economy. So it really does perplex me that after 27 years in this industry - this highly innovative, fast-paced business - that I hear people describe the auto industry as a dinosaur.

"I have to tell you that Australia's auto industry is anything but prehistoric. We are developing new technologies, state-of-the-art manufacturing skills, and growing energy industries to help solve other problems, like climate change which is very topical today. As both importers and manufacturers, we play, I believe, a strategic role in addressing sustainability, and helping create reduced carbon emissions for the entire country," he said.

## Australia's highly competitive market

The Australian automotive industry is one of the most open and competitive in the world. The average rate of automotive tariffs in Australia (around 3.5%) is lower than for most agricultural products. How does Australia compare to other markets? Some applied vehicle tariffs are:

- USA 2.5% for passenger cars and 25% for light commercial vehicles
- South Korea 8%
- EU and UK 10%
- China 25%
- Malaysia 30%
- Russia 30% plus 18% VAT for imports
- Brazil 35% plus Industrial Products Tax 25% to 55%
- India 60%
- Thailand 80%.

Australian consumers have benefitted greatly from the reduction of trade barriers and imported vehicles now represent around 85% of new vehicle sales in Australia. In a market of one million annual sales, Australia has 60 automotive brands competing. Japan's six million vehicle market hosts only 33 brands and only 32 brands compete in the USA market of about 16 million units.

However, Mike Devereux said the real competition in the automotive industry is convincing the vehicle producers' parent companies to invest in Australia. "When we compete to design, engineer or build a new model in this country, we're not just competing with rival brands, we're actually competing with rival countries. There are currently just 13 of these countries that have the ability to design, engineer and manufacture a motor vehicle from the ground up," he said.

“And I have to tell you, there are a lot more of them that want to do what we do, and they will offer whatever it takes to attract that investment, because these countries understand what it means for education, for employment and for innovation. They understand the strategic rationale of this industrial capability.”

“Where this billion dollar capital intensive industry exists, one of two things always happens - government protection, or government investment - and sometimes both. Government investment, or intervention, should not be a dirty word. Government support and investment in automotive capability can happen in several ways,” said Mike Devereux.

He highlighted the importance of co-investment programs to attract new capital investment for next generation models. The co-investment model - ranging from one private dollar to one public dollar, up to a three private dollars to one public dollar ratio - is used successfully in Australia. Another approach used in other Australian industries is tax rebates.

*“Mining for example has claimed over \$6.2 billion in the last four years from the Federal Government through the diesel fuel rebate scheme,” said Mike Devereux. “This translates to an average of about \$1.5 billion a year for the Australian taxpayer. This does not require the users of the rebate to guarantee a return on investment, a commitment to capital investment, there’s no guarantees of job retention or growth, and there’s no direct link to innovation or efficiency improvements”.*

In contrast, the now defunct Green Car Fund demanded 3 to 1 co-investment, guaranteed return on investment, job retention, growth, innovation and efficiency improvement from government partners. So, Mike Devereux challenges - why do some commentators believe Australian tax payers are supporting their auto industry disproportionately, compared to other countries?

## Governments compete for vehicle manufacturing

One reason was a recent OECD report containing misleading data. It compared the Australian 12 year New Car Plan launched in 2008 with short term retail stimulus packages, such as the “cash for clunkers” schemes run in European countries, some for only 12 months.

Mike Devereux said: “What the OECD had estimated was about \$200 per person for every Australian, in support for the automotive industry. It is probably less than \$20. That’s an order of magnitude of difference. It is no small error. And it actually highlights that Australia’s auto industry is competing in a global market with actually a fraction of the support, direct support, on a per person basis that many other countries enjoy”.

He cited some recent examples of co-investment from other countries to illustrate the widespread application of government support. “The state of Saxony in Germany, home to BMW and VW, contributed 46 million Euros to BMW for their Megacity electric vehicle program, and 84 million Euros to VW for small and medium car production,” he said.

“In the state of Georgia, in the United States, \$410 million in direct support and incentives helped Kia build its very first USA plant, which bought about \$1 billion of investment from the self-creating company. Similarly, Hyundai in the USA state of Alabama received a quarter billion dollars in support of its manufacturing operations.”

*“Most interesting though is the support and the approach being taken by the UK, a high cost country like Australia and the United States, which had also allowed its manufacturing base to erode. Prime Minister David Cameron is rebuilding the automotive industry in the UK and their co-investment policies are attracting literally billions of dollars in manufacturing investment.”*



*Exports of Australian made vehicles are critical to maintaining sustainable production volumes for local manufacturers.*

“Nissan, for example, is investing \$192 million pounds to build the next generation Qashqai SUV, at its Sunderland plant, securing around 600,000 direct and indirect jobs. Nissan also committed GBP420 million to locally build the Leaf electric car, and to lift the MI on battery cells to power it, which will also maintain about 2000 jobs in that same area. This investment was directly supported by the UK Government with about GBP21 million from its Grant for Business Investment Program, and GBP137 million, again, from the European Investment Bank.

“BMW, again in the UK, invested GBP420 million in their Mini manufacturing operations in Oxford, taking its total manufacturing investment in the UK - and this is an incredible investment - up to GBP1.5 billion, securing 5000 jobs, and making Mini the third largest vehicle manufacturer in the UK.

“Now as part of the announcements, Prime Minister Cameron said: ‘It’s very much part of our ambition as a government to rebalance our economy. We’ve been far too reliant on financial services, too reliant on one part of the country. We want to see more manufacturing, and I’m delighted that so many automotive manufacturers are bringing production and supply chain onshore’.

“Both companies said that the UK Government’s support for the manufacturing sector was a key factor in their decision to invest in these next generation production lines in the UK. They echoed Cameron’s view that industrial growth was absolutely vital to rebalance the economy, and to also bolster general growth in the British economy, and that this would only happen through technological innovation.

“So where does that leave Australia?” asked Mike Devereux.

## Manufacturing creates more jobs

“Well frankly, I think it leaves us at a fork in the road. Tim Colebatch from The Age newspaper aptly described the risk that we currently face, and I quote from Tim: ‘Mineral prices could fall sharply. But when factories close they do not reopen. To avert that would require big policy shifts, not band aids. The risk is that we will lose manufacturing permanently for a mining boom that just turns out to be temporary’.

*“Manufacturing creates jobs more than any other sector - and this is true in Australia, or any place in the world. And it’s not just the downstream jobs in terms of components, but it’s actually outside our own sector - in industries like packaging, telecommunications, mining, construction. For the auto industry in Australia, which employs about 59,000 direct jobs, it’s estimated that for each of these jobs, another six people are employed in supporting industries around the automotive industry.*

“In the case of the new locally made Holden Cruze small car, our preliminary economic modelling shows that just making this vehicle in Australia versus importing it from Korea injects about \$230 million a year into the Australian economy. It’s something that we’re very proud of.

“To use another example from Toyota, its local production played a very important role in actually securing the future of automotive glassmaking in this country. Without Federal and Victorian Government support, these capabilities would have been lost overseas. “Australia can be part of the ‘golden age of manufacturing’ if its governments provide long term policy certainty, clarity, consistency and competitiveness. If Australia does want to be a knowledge economy and a diverse economy, and it wants to be more than a farm, a mine or a hotel, then we need to invest in our capability to design, engineer and build.

“If we don’t, the real ‘lost’ opportunity cost is something we can’t even imagine today,” concluded Mike Devereux.



Local manufacture allows Australian vehicle buyers to select from models specially made for local conditions and preferences.

# Help - We want your ideas for SAE-A events!

Dear Member,

As indicated by outgoing President Patrick Ross and incoming President Bill Malkoutzis, the SAE-A is preparing for the various challenges that lie ahead for our society.

As the Chairman of the Events Committee, I am also looking to the future to build a robust model that will showcase relevant events and conferences, and that will be of interest and accessible to all members of the SAE-A.

This model will include the establishment of state based event committees that will have access to their local universities, TAFE colleges and industry (professional and trade) offering events and conferences encompassing all sectors of the mobility industry. We envisage that the state event committees will be able to showcase events and conferences that are relevant both on a local and national level.

To that effect, we are putting out a call to any members that can assist in 2012 with event and conference planning to contact me and be part of the Events Committee.

Meetings will take place bi-monthly (approx two hours) and will be held in person at the National Office with access to teleconference facilities to accommodate interstate event committee members.

Contact me at [motortecnik@gmail.com](mailto:motortecnik@gmail.com) or 0412 173 408. I look forward to your support in 2012.



**Tim Car**  
SAE-A Events Chairman

# Cautious welcome for the Trans-Pacific Partnership



*Automotive manufacturing, such as Toyota Hybrid Camry production at Altona, help keep strategic high tech skills and materials in Australia to benefit other industries, which increases employment and reduces imports.*

In a separate statement, the FCAI has urged the Australian Government to ensure it achieves genuine reciprocal market access for Australian automotive manufacturers through bilateral and multi-lateral trade agreements.

While FCAI welcomes the involvement of Australia in the Trans-Pacific Partnership (TPP), this endorsement is conditional upon the Australian Government gaining genuine equivalent access to overseas automotive markets as exists in the Australian domestic automotive market.

The TPP could include Brunei, Chile, Japan, Malaysia, New Zealand, Peru, Singapore, United States and Vietnam. Of particular concern to the industry are any agreements with nations such as the Chinese or South Korean governments, which provide comprehensive support systems - in addition to fixed tariffs - to protect local vehicle manufacturing and to gain export revenue.

The Australian industry's experience following the Thailand free trade agreement quickly revealed how non-tariff barriers can be used to damage Australian exports to a trade "partner". It is essential that any future trade agreements do not result in competitive disadvantage for Australian manufacturers.

The TPP should be a comprehensive and high quality free trade agreement which must involve, not just reciprocal reductions in tariffs, but also address non-tariff barriers to trade. The Australian Government should ensure that all participants in these negotiations are willing and able to demonstrate action to remove non-tariff barriers before Australia engages in negotiations.

Examples of non-tariffs barriers that countries use to protect their auto industries include the maintenance of a discriminatory tax structure, the frequent introduction of new technical barriers, non-World Trade Organisation compliant customs valuation methodologies, currency manipulation and direct/indirect actions that reinforce anti-import bias against imported cars, such as subsidised interest rates on the purchase of domestically produced vehicles.

Exports of Australian made vehicles grew from 35,000 vehicles in 1996 to a record 162,000 vehicles in 2008, worth \$5 billion in export income for Australia. Exports have been essential in sustaining local manufacturing production volumes and could continue to grow if the Australian Government is able to gain access for automotive exporters to overseas markets.

The Australian automotive sector is at the forefront of the export of elaborately transformed goods and forms a vital part of a balanced economy. Exports of Australian made vehicles are already under pressure due the strength of the Australian dollar, high costs and intense competition from other automotive manufacturing nations to attract investment into the next generation of low-emission vehicle technology and production.

The 23 January announcement by Toyota Australia to cut 350 jobs due to lost exports was an indication of the challenge cause by the high Australian dollar.

*Australian vehicle manufacturing jobs are dependent on achieving a level playing field. All trade agreements, including the TPP, must ensure that Australian-made cars have equivalent reciprocal access to overseas markets. Previous FTAs negotiated by Australia have not resulted in equivalent market access for automotive products. Non-tariff barriers in particular have been used to restrict or prevent the import of motor vehicles from Australia.*

# Designing a Cruze to hatch global sales

By SAE-A Editor Barry Oosthuizen



*The Australian designed Cruze hatch headed for global markets*

**The Cruze brand is a case study in modern global vehicle platform development. The recent Cruze model extension of a hatch back model developed by GM Holden illustrates how Australian automotive engineers can become players on the international stage.**

**As discussed by GM Holden Chairman and Managing Director Mike Devereux in his National Press Club address ([See Industry Comment page 22](#)), an important part of survival in the competitive international market is earning a role within your company's own global network.**

**In this article, we review the successful story of the Cruze and highlight some of the technical aspects of the model's international success.**

## Cruze history

The original Cruze was based on a Suzuki Ignis / Swift subcompact hatch back, which was styled by the GM Holden Port Melbourne Design Studio, and released in 1999 at the Tokyo Motor Show as the Chevrolet YGM-1.

In 2008, a new Cruze package on the Delta II platform was developed in South Korea for global GM production. Since launch, the GM code J300 model has been manufactured / assembled, in Brazil, China, India, Kazakhstan, Russia, South Korea, Thailand, United States, Venezuela and Vietnam. It is now manufactured in Australia. The true global scope of this platform is revealed by its intended sales in about 60 countries.

At a launch in December 2008, then Holden Chairman and Managing Director Mark Reuss said the Cruze would be manufactured at Holden's Elizabeth, South Australia plant - the home of Commodore manufacturing. With rapidly dwindling large car sales, adding a compact vehicle to the plant's capability would deliver needed production volume. He said Australian content of the new vehicle (at retail value) would be 40% to 50% and would be increased over time.

The South Korean made Cruze was launched on the Australian market as Holden model designation JG in 2009 and it proved popular, selling about 40,000 units in its first two years.

At its 2010 launch in the USA, the Cruze was billed as the most significant new GM vehicle launched in North America post the company's bankruptcy. Mark Reuss, then GM President of North America Operations, declared the model's importance to the USA market: "This is everything for us."

Further significant Australian input to the Cruze was made with the hatch version unveiled at the Paris Motor Show in September 2010. The hatch model was designed at Holden's Port Melbourne Design Centre.

In March 2011, production of an updated Cruze model - designated the JH series - began at Elizabeth. New investment in the plant enables it to produce both Commodore and Cruze vehicles on the same production lines. The Australian Government invested \$149 million from the Green Car Innovation Fund and there was a \$30 million injection from the South Australian Government and GM Holden contributed \$447 million. The major green development for this new Australian version was a turbocharged 1.4 litre version with six speed manual or automatic transmissions.

Current Holden Chairman and Managing Director Mike Devereux said at the November 2011 introduction of the Cruze hatch that: "The launch of this car showcases Holden's ability to design, engineer and build a car that is world class and a genuine global player for GM," he said.

### Australian design input to Cruze hatch

Holden Design Manager Martin Love said the Port Melbourne Design Studio team combined European design sensibilities with an injection of Holden DNA to produce a car that was stylish and practical and offered broad appeal.

"To be involved in the development of such an important vehicle that will be sold around the world is one of the highlights not only of my design career, but of the entire team that worked on this project," Martin Love said. "The customer base for the compact hatch market is probably the most diverse imaginable, so we really had to be creative in our approach."

The result is a sweeping coupe-like roofline, short overhangs, a sculpted rear tailgate topped with an integrated spoiler, rising belt line and a wide stance to give the Cruze hatch a dynamic, sophisticated and eye-catching aesthetic. Despite its sporty appearance the Cruze hatch offers slightly better ingress / egress compared to the sedan, due to the hatch design affording extra head clearance when entering and exiting the vehicle.

The hatch shares its 2685mm wheelbase, 1477mm height and 1797mm body width (excluding mirrors) with the sedan. With short front and rear overhangs, length for the CD and CDX models compared to the sedan equivalents was reduced to 4518mm (-79mm), while the length of the unique Australian-developed SRi and SRi-V hatch models is 4542mm (-87mm).

Cruze hatch shares much of its interior styling with the sedan and clever design of the rear tailgate and interior load space resulted in a luggage space that will hold 413 litres with the standard 60/40 split fold rear seats upright, one of the largest in its class. This expands to 1254 litres with the rear seats folded flat.

Martin Love said the biggest challenge was integrating the hatch body style to ensure it maintained visual coherence with the Cruze sedan. "There may be a perception that we simply redesigned the rear of an existing car, but in reality it's a bigger challenge than starting with a clean sheet of paper," he said.



*Cruze hatch design team members included Holden Design Manager Martin Love and Lead Designer Lee Mitchell*

The key to the design brief was the global nature of the car. Lead designer Lee Mitchell and the team canvassed a number of options during the initial phase of the design, keeping in mind the range of preferences from the different target markets.

"Different scenarios at each end of the spectrum were investigated, from an almost wagon-type hatch through to a sporty coupe-like hatch, including lots of proportional studies looking at different rear end overhangs," Martin Love said.

"Australians and Europeans have similar preferences for sporty vehicles in this class, so we were keen to give the hatch a more youthful character than the sedan. When all the options were sketched, the sportier version that Lee designed won hands down. Everyone said: 'That's the car we've got to do'."

The Holden Design Studio is an important part of General Motors' global design network and is one of only three GM facilities with the capability to design and build concepts and show cars for international exhibitions and motor shows.

Martin Love said international GM management recognised the strength of this team following the success of its designs for VE Commodore, Monaro and Chevrolet Camaro. "With Cruze being such an important global vehicle for GM, it shows a lot of confidence in Holden that we were given this job. GM Design is a global operation and Holden's Design Studio is an integral part. So it is incredibly rewarding to take the lead on products like the Cruze hatch, which really showcases Holden's talent and skills on a world stage," Martin Love said.

Extensive Australian testing and evaluation covered more than 140,000km and saw a number of key Australian engineering modifications made. Many of these engineering changes have now been adopted globally on both Cruze hatch and sedan.



Director of Vehicle Assembly Operations Richard Phillips said the new investment in GM Holden's Elizabeth, South Australia manufacturing plant increased its flexibility and competitiveness.

### Delivering manufacturing flexibility

Engineering work on the Cruze hatch ran concurrently with the localisation program for the Series II Cruze sedan and began soon after Holden's December 2008 announcement to build a second car line.

With the addition of the Cruze hatch production, Holden Vehicle Operations (HVO) at Elizabeth now builds 51 models, on two architectures, including six body styles and nine variants in left and right hand drive. The production line rate is up from 430 units to 480 a day over two shifts, with Cruze models accounting for approximately 185 vehicles a day.

The Cruze and its export program added about 300 new manufacturing jobs at the plant in 12 months. Holden manufacturing engineers designed 13 new pieces of equipment for the plant to enable in-house manufacturing of specific components for Cruze hatch including rear fascia assemblies, rear tailgate trim, body sides and roof. Cruze bodies are built in the South Bodyshop and then join Commodore on the line in General Assembly.

GM Holden Director of Vehicle Assembly Operations, Richard Phillips said: "We are now more competitive and we have added component manufacturing capacity, increasing the number of body panels we stamp and the plastics we mould. This enhances the flexibility of Holden's manufacturing operations."

### New supplier opportunities

Building Cruze hatch in Australia has enabled Holden to both engage new local suppliers and increase the number of components produced by existing suppliers. GM Holden Associate Director of Supplier Strategy Jaydeep Solanki said the introduction of Cruze manufacturing at Elizabeth provided significant opportunities for suppliers.

"The Cruze manufacturing program has created more than 200 new jobs in the Australian supplier community. We are now buying an additional \$100 million worth of components from Australian suppliers every year, so this has been a very big boost for the automotive component industry," he said.

"We not only have some new suppliers, but importantly, the Cruze program has enabled us to increase the number of components we source from existing Commodore suppliers. This new business helps ensure the long term viability of Australian suppliers through greater economies of scale."

Geelong-based MHG Glass is among the new suppliers engaged specifically for the Cruze hatch to supply the new tail gate glass. Other existing suppliers to benefit from Cruze manufacturing include Futuris Automotive Interiors, supplying Cruze seats, and Hirotec Australia, which stamps all the closures for the Cruze sedan and hatch including doors, bonnet and boot lid.

Holden is now looking at a second phase localisation program for the Cruze that may see additional components for the Cruze sedan and hatch sourced locally.



Doors on the Cruze incorporate triple-layered sealing to reduce noise, vibration and airflow through the door and into the passenger compartment.

# Cruze Technical highlights

The top end of the front wheel drive Cruze and Cruze Hatch range are the SRi and SRi-V sport models and the high feature CDX version, plus the base CD line. The turbo diesel models are currently the most fuel efficient Australian made production cars.

## Safety

Cruze has a 5-star Australian New Car Assessment Program rating in Australia. A unibody of high strength steel incorporates full length frame rails and a safety cage a single, welded unit, designed with front and rear crush zones. Bumpers are engineered to require minimal repairs after collisions. A collapsible pedal release system and front and side and curtain airbags are fitted.

## 1.4 litre DOHC 16-valve 4-cylinder iTi turbo petrol

Sourced from Aspern, Austria, this engine develops 103 kW @ 4900rpm and 200Nm @ 1850-4900rpm. Features include:

- Low-mass hollow frame cast iron block
- Dual overhead hollow cast camshafts with variable valve timing
- Chain-driven cams
- Roller-finger camshaft followers
- Piston-cooling oil jets and integrated oil cooler
- Variable-flow oil pump
- Electronically controlled thermostat
- Compression ratio 9.5 : 1

The turbocharger is integrated within the exhaust manifold for reduced weight and greater packaging flexibility. A reinforced crankshaft and stronger connecting rods deliver additional strength to support pressurised power and torque over a wide rpm band.

Gearbox options and ADR 81/01 economy and emission figures are:

- Six speed automatic = CD model 6.9L/100km & 164g/km, SRi/SRi-V model 6.9L/km & 164g/km
- Six speed manual = CD model 6.4L/100km & 153g/km, SRi/SRi-V model 6.6L/km & 155g/km

## 1.8L DOHC 16-valve 4 cylinder ECOTEC petrol

Sourced from Gunsan, South Korea, this naturally aspirated 1.8L engine shares many 1.4L turbo features:

- Hollow-frame cast iron cylinder block
- Dual-overhead hollow cast camshaft with variable phasing
- Variable intake manifold
- Lightweight direct acting hydraulic tappets with reduced friction
- Oil / water heat exchanger
- Piston cooling oil jets
- Electronically controlled cooling system
- Compression ratio 10.5 : 1

The two stage variable intake manifold optimises fuel economy and performance. At engine speeds below 4,000rpm, inlet air passes through 910mm intake tracts to increase torque. Above 4,000rpm, a rotary sleeve in the lightweight composite intake manifold closes off the full

length of the intake tracts, forcing air through a shorter, 260mm path to build power.

The rotary sleeve minimises airflow resistance at higher speeds, ensuring the maximum cross section area in the open position. The cross section of the intake runners is constant, with the length of the runners reduced by 60% in the closed position (greater than 4,000 rpm). This two stage manifold enables the 1.8L to produce about 90% of peak torque from 2,400rpm to 6,500rpm.

Gearbox options and ADR 81/01 economy and emission figures are:

- Six speed automatic = CD/X model 7.4L/km & 175g/km
- Five speed manual = CD/X model 7.0L/km & 166g/km

## 2.0 litre turbo diesel

Sourced from Gunsan, South Korea, this is a powerful and fuel-efficient diesel offering:

- An advanced, electronically controlled turbocharger with intercooler
- High-pressure common rail multiple injection fuel system
- Diesel particulate filter system that's maintenance-free for the life of the vehicle
- Compression ratio 16.5 : 1

Gearbox options and ADR 81/01 economy and emissions figures are:

- Six speed automatic = 6.7L/km & 176g/km
- Six speed manual = 5.6L/km & 147g/km

## Transmissions

The five and six speed manual transmissions feature:

- One piece housing for compact, light design
- Needle bearings for all gears
- Enhanced low gear engagement

Six speed Active Select automatic transmission is optional across the range. The 1.8L petrol engine is matched with a 6T30 unit, the 1.4 iTi turbo petrol engine with a 6T40 unit, and the 2.0L diesel with 6T45 unit. Features include:

- Clutch-to-clutch shift operation
- Wide spread ratios
- All have 'tap-up/tap-down' Active Select feature allowing the driver to select and hold gears

## Electric Power Steering (1.4 iTi)

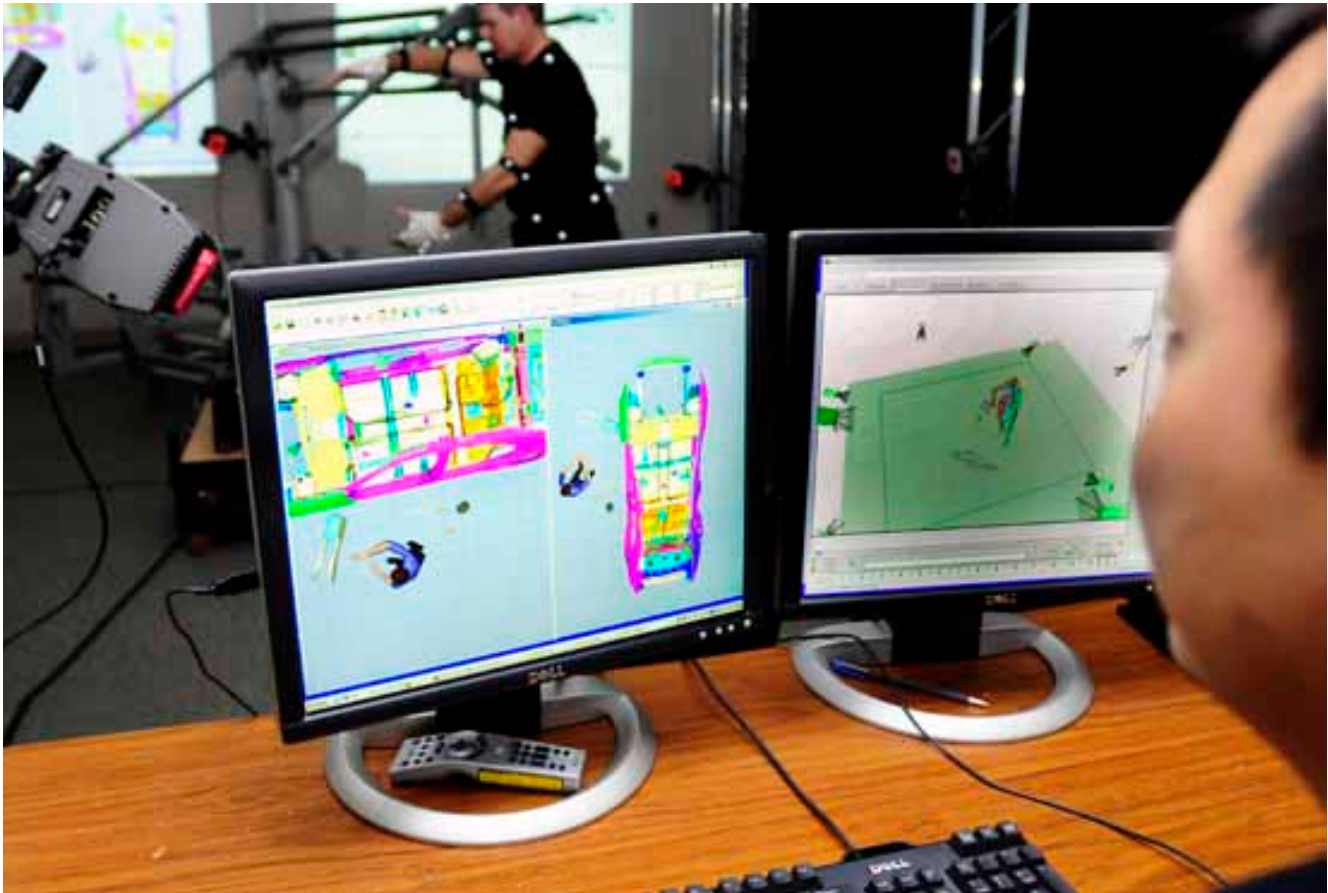
1.4 iTi range features an electric power steering system which only demands power from the electrical system when steering input is required. It eliminates the constant power demand from an engine belt driven hydraulic unit.

The result is improved fuel economy and less engine power loss. The electric power steering system also allows for varied steering efforts according to vehicle speed.

The 1.8L and 2.0L vehicles have hydraulic power steering.

# Ford Ranger virtually assembled by Hollywood avatar

Long before the first physical parts were produced or a prototype vehicle built for the new global Ford Ranger, Ford Motor Company's new Hollywood inspired "digital worker" had already assembled the compact pickup in a virtual world.



Testing virtual assembly line technology.

Based on Ford's virtual workers "Jack" and "Jill", the new multi-national "avatar" was created using size and shape population data gathered from Ford assembly plants across the globe. The virtual assembly program will help ensure ergonomically safe workplaces and quality built vehicles.

The key to the program is motion capture technology that digitally records movement, making non-human characters appear more lifelike. By customising this data, Ford researchers have created a manikin used in ergonomic assessments that employ motion capture technology, the technique that mesmerises filmgoers and video games users.

"Ford is one of the leaders in virtual technology," said Allison Stephens, Ford ergonomics specialist with Vehicle Operations Manufacturing Engineering in North America.

"We combine Hollywood's motion capture technology with human modelling software in our Detroit labs to design production tasks around the world that are less physically stressful on workers. We adjusted the sizes of our 'Jack and Jill' models to reflect the populations at our global plants, so all our regions can benefit from what we've learned."

As Ford is building new manufacturing plants in Asia and other parts of the world, Allison Stephens said it was imperative the new manikin be standardised to give clear engineering direction while continuing to raise quality.

Other than the Ranger being built in Thailand and South Africa, the digital manikin's first global assignments are for new products planned for new assembly plants in China, as well as the new Focus being assembled in Germany and the U.S.

## One Ford, one direction

“Jack and Jill” are examples of the versatility of digital design. As part of Ford’s product development, the ergonomic data they provide are handed to the virtual build arena, where a program team – designers, engineers, suppliers and line operators – assemble a vehicle part by part, in a virtual environment.

This virtual build process takes place even before Ford and its suppliers install tooling and set up workstations.

In the virtual build event, “Jack and Jill” assemble the vehicle on a wall sized computer screen as the program team scrutinises the vehicle’s manufacturing feasibility:

- How well the parts go together in the assigned sequence
- How the sequence works at the specific plant where the vehicle is to be produced

“We need to have all four regions of Ford using the same manikin,” Allison Stephens said. “Because we’re building global vehicles, we need to have one engineering direction. That’s what we have done.”

To determine the new dimensions of the modernised “Jack and Jill”, Ford North America and Ford of Europe collected data from their assembly plants around the world.

This data was analysed by Pennsylvania State University and human dimensions were determined that would reflect Ford’s global worker population. The global worker population is larger, taller and heavier than originally programmed.

The standardised manikins can then be customised to the regional Ford population that is building a specific vehicle. A 1.62m female manikin was determined to represent the smallest individual found in a global Ford facility.



A demonstration of assembly line virtual technology.



The new Ford Ranger 4x4 at work.

## Building on success

The new standardised manikins provide benefits for workers, the company and customers.

“This is a very important move, because now everyone has the benefits of our high standards,” Allison Stephens said. “We’re matching our job demands to our worker capability, so our assembly workers benefit. And because they can do the jobs correctly and well, our quality benefits.”

“In the end, customers get the benefit of our improved quality.”

The benefits will continue as technology progresses and Ford builds on its success. Ford headquarters in Dearborn, Michigan and Merkenich, Germany have motion capture technology laboratories where new ergonomic studies can be performed as new vehicles are designed. Visualisation centres are being developed for Ford facilities in Asia and South America with 3D television sets.

“If we do ergonomic studies for those places, we can send them the files and they can watch the studies in 3D. They won’t have to go to the expense of building their own motion capture labs,” Allison Stephens said.

Soon the advanced manikins will have a friend, “Santos”, a computerised avatar now in the testing phase at Ford. “Santos” was created for the USA Department of Defence as part of the Virtual Soldier Research program at the University of Iowa. The military employs “Santos” to find ways to ease the physical strain on soldiers.

“Santos will be employed on highly demanding jobs that require many muscles to be analysed at the same time,” said Allison Stephens. “This type of analysis has never been done before. We are excited to have Santos join the team.”

# New OH&S regime – is your business ready?

By Evan Stents, Lead Partner, Automotive Industry Group,  
HWL Ebsworth Lawyers



**In January 2012 the new Model Work Health and Safety legislation (Model Legislation) is to be enacted across Australia. It will replace the current occupational Health and Safety (OH&S) legislation in each State and Territory.**

The reforms contained in the Model Legislation entail a significant expansion of the duties and liabilities of employers from the current OH&S legislation, and businesses need to ensure that they are ready for this change.

The guiding principle of the Model Legislation is to ensure that all people are given the highest level of health and safety protection from hazards and risks arising in the workplace, so far as is reasonably practicable.

## Expansion of primary duty of care

Historically, an employer owed a primary duty to its employees to provide a safe workplace. Under the Model Legislation, the scope of the primary duty has been expanded from being owed only by an “employer” to now include a “person conducting a business or undertaking” (PCBU). In Queensland and the ACT, the primary duty did extend to PCBUs.

*The Model Legislation definition of PCBU recognises a broader range of working relationships that is more reflective of modern trends, such as the use of contract labour, and the move away from the traditional employer and employee relationship.*

The Model Legislation does not attempt to define what constitutes a business or undertaking in any great detail other than to say that a person conducts a business or undertaking whether:

- The person conducts the business or undertaking alone or with others
- Or not the business undertaking is conducted for profit or gain

Examples of what is considered to be a business or undertaking are provided by the Model Legislation, including retailers, wholesalers, manufacturers, importers who want to sell imported goods, owner drivers, transport or courier businesses, principal contractors on construction sites, self employed people, government departments or agencies, not for profit organisations, and building owners who engage one or more persons to undertake work on the building.

However, a PCBU does not include volunteer associations or a situation where a residential householder engages a tradesperson to do repair work on their property.

## Duty of care

In general terms, under the Model Legislation, the primary duty of care owed by a PCBU is to ensure, so far as is reasonably practicable the:

- Provision and maintenance of a work environment without risks to health and safety
- Provision and maintenance of safe plant and structures
- Provision and maintenance of safe systems of work
- Safe use, handling and storage of plant, structures and substances
- Provision of any information, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking

The Model Legislation requires that a PCBU eliminate risks in the workplace as far as reasonably practicable, which is defined as:

“...in relation to a duty to ensure health and safety, [reasonably practical] means that which is or was at a particular time reasonably able to be done in relation to ensuring health and safety taking into account and weighing up all relevant matters including:

- The likelihood of the hazard or the risk concerned occurring
- The degree of harm that might result from the hazard or the risk
- What the person concerned knows, or ought reasonably to know, about:
  - o the hazard or the risk
  - o ways of eliminating or minimising the risk
- The availability and suitability of ways to eliminate or minimise the risk
- After assessing the extent of the risk, of the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk”

## New definition of worker

*The Model Legislation has also expanded the definition of “persons” to whom the duty to provide a safe workplace is owed. Traditionally the primary duty was owed to an employee of an employer. However, under the expanded definition of PCBU in the Model Legislation, the PCBU will owe a duty to much broader categories of workers, including: employees, contractors or sub-contractors, employees of contractors or sub-contractors, out workers, apprentices or trainees, students gaining work experience, volunteers and labour hire employees.*

## Duty of officers

Under the Model Legislation, an officer of a PCBU can potentially be exposed to imprisonment or a fine in the event that a regulator establishes that they were not at the time exercising due diligence to ensure that the PCBU complies with their duty under the Model Legislation.

An “officer” is a person who makes or participates in making decisions that can affect the whole or a substantial part of the business or undertaking. The Model Legislation provides as follows:

“If a person conducting a business or undertaking has a duty or obligation under this Act, an officer of the person conducting the business or undertaking must exercise due diligence to ensure that the person conducting the business or undertaking complies with that duty or obligation.”

An officer of a PCBU should be able to point to a due diligence framework and its implementation at the workplace in the event the Regulator requests such evidence during a site visit, whether in relation to a workplace injury or otherwise. Up to date and contemporaneous records of the implementation of this framework will be important to establish that an officer has complied with the duty.

## Due diligence steps required

The Model Legislation sets out the minimum requirements for an officer to exercise due diligence. This consists of taking reasonable steps to:

- A. Acquire and keep up-to-date knowledge of work health and safety matters
- B. Gain understanding of the nature of the operation of the business or undertaking and generally the hazards and risks associated with those operations
- C. Ensure that the PCBU has available for use and uses appropriate resources and processes to eliminate or minimise risks to health and safety for work carried out as part of the conducting of the business or undertaking
- D. Ensure that the PCBU has appropriate processes for receiving and considering information regarding incidents, hazards and risks and responding in a timely way to that information
- E. Ensure the PCBU has and implements processes complying with any duty or obligation under the Act
- F. Verify the provision and use of the resources and processes referred to in paragraphs (C) to (E) above.

## Penalties

The Model Legislation contains significant increases in the penalties that apply for breaches of a PCBU's primary duty.

Category 1 offences involve those that occur in circumstances where a person suffers serious harm, or is killed as a result of the conduct of a PCBU, and the PCBU is found to have acted recklessly in the circumstances.

Reckless conduct under Category 1 includes where a person, without reasonable excuse, has engaged in conduct that:

- Exposes an individual to whom a duty is owed to the risk of death or serious injury or illness
- The person is reckless as to that risk

Category 1 offences attract a maximum penalty of \$3,000,000 for a business and up to \$600,000 and/or imprisonment of up to five years for individuals who are officers.

Category 2 offences do not include a recklessness requirement. These offences occur when a person is exposed to the risk of death or serious injury as a result of the PCBU breaching its obligations under the primary health and safety duty under the model legislation. If proved, a PCBU is exposed to a potential maximum penalty of \$1,500,000 and up to \$300,000 for an officer.

Category 3 offences do not involve a risk of death or serious injury or illness and apply in circumstances where a person has a health and safety duty and that person fails to comply with the duty. Category three offences carry a maximum penalty of \$500,000 for a PCBU and \$100,000 for an officer.

*Given the significant changes that are introduced throughout Australia, it is vitally important for businesses to be aware of the expanded range of OH&S obligations that are owed under the Model Legislation, and whether their businesses are compliant with these new obligations.*

## Falcon EcoBoost heads 2012 Ford line-up

Ford Australia will continue its product-led advancement in 2012 with the arrival of the impressive new FG Falcon MkII with EcoBoost technology.

The FG Falcon Mk II EcoBoost is one of several key new models Ford Australia will release over the next 12 months.

The others include the new compact Ford Kuga SUV and stylish performance Focus ST hatch. The new Ranger line-up will also be enhanced with the arrival of several new variants, including the sports oriented Wildtrak.

Like the Fiesta sedan and hatch, Focus manufacturing will move from Europe to Thailand in 2012. The Focus is currently made at Ford's Saarlouis plant in Germany, but from mid-2012 will transfer to the Rayong plant in Thailand.

## Ford Australia Historic archive dedicated to Adrian Ryan

More than 80 years of Ford Australia history found a safe new home when company President and CEO, Bob Graziano, opened the Ford Australia Archives this week at company head office in Campbellfield, Melbourne. The centre was dedicated to the late Adrian Ryan, who was instrumental in collecting many Ford documents, photos and brochures and storing them for safekeeping. Ryan worked for many years in Ford's Public Affairs department.

The collection includes important Ford documents and photos dating from the company's early manufacturing days in Australia. It is one of only four historical archives in the entire Ford Motor Company. The others are in Dearborn in the United States, Cologne in Germany and the UK.



The new Ford Australia historical archive is one of the most comprehensive collections of motor manufacturing documents in the region.

## Toyota Fun-Vii: a Smart Phone on wheels

The domain of instant communication to relate every thought and feeling could come to the automotive world.

Imagine a car that changes its appearance as easily as downloading a phone app. You could make that car reflect how you feel, or what you are doing, every minute of every hour.

The three seater Toyota Fun-Vii is such as car, one of several concept cars shown by Toyota at the Tokyo Motor Show under the theme of "Fun to Drive, Again". The ultimate in personalisation, the Fun-Vii offers the ability to alter the content displayed on the interior and exterior.

The whole body can be used as a display space, with the body colour and display content changeable at will. This allows the entire vehicle to function as a terminal for displaying messages or other information.

The interior is also adjustable to match the mood of the moment. Navigation information is blended into the interior design through the use of augmented reality, and the car's "navigation concierge" can provide passengers with driving information and guidance through a vocal interface.

A network update function makes sure the software for the vehicle's drive, control and multimedia system are always up-to-date. The Fun-Vii is also able to link with surrounding vehicles and infrastructure, allowing it to detect potential hazards in advance, or to connect with friends who are driving nearby.



Toyota Global Design Management Division General Manager Yoshihiro Sawa demonstrated the Winglet personal mobility concept machine, while introducing the FUN-Vii concept vehicle at the 2011 Tokyo Motor Show.

## North American International Motor Show

### Glitz and glamour returned to Detroit's motor show this year with concept cars and new sports models.

Among the concepts were two Chevrolet coupes - a rear wheel drive Code 130R and a front wheel drive TRY 140S. Appealing to young car buyers, General Motors North America President Mark Reuss introduced a product development program encouraging people to engage in "co-creating" new vehicles. He called the process "crowd sourcing".

Toyota unveiled the NS4 advanced plug-in hybrid concept vehicle at the Detroit show. It incorporates a focus on electronic connectivity and the human machine interface (HMI) in a digital age concerned with person-to-car and car-to-society.

The HMI is built around a multi-touch screen similar to a smartphone. It conveys information quickly with minimum distractions and maximum driver awareness. It also directs air-conditioning, audio, battery-charge and navigation functions and is capable of "learning" driver preferences and habits to anticipate driver responses in specific environments and situations.

Separate from the Prius range, the NS4 was the engineers' response to a challenge to design a new mid-sized concept for potential global launch by 2015. The NS4's advanced power train is a next-generation Hybrid Synergy

Drive plug-in system that is smaller and lighter with improved fuel economy, better acceleration and longer electric range, while maintaining a short charge time.

In renewing an iconic brand name, American Honda unveiled a NSX Concept as an interpretation of the design and technology directions for next generation supercars. Using lightweight materials and a mid-mounted V6 engine, the NSX Concept employs an innovative Sport Hybrid Super Handling All Wheel Drive™ hybrid system.

The NSX Concept champions the racing philosophy of an extremely favourable power-to-weight ratio, rather than brute power. With a unique 2 Electric Motor Drive Unit with a bilateral torque adjustable control system, the new hybrid all wheel drive system will instantly generate negative or positive torque to the front wheels during cornering. Honda anticipates this will deliver handling performance unmatched by previous AWD systems.

In addition to the handling benefits of the Sport Hybrid SH-AWD® system, the VTEC® V6 engine with direct-injection, will work in concert with a dual clutch transmission and built-in electric motor, to create supercar acceleration while offering outstanding efficiency.



The NS4 concept signals a new low vehicle height and cabin-forward tilt styling direction for Toyota, aimed at creating an emotional connection with consumers.



The NSX will be developed by Honda R&D Americas, will be made in the state of Ohio, and is expected to go on sale in three years.

## Entries open for VACC Target 2030 Competition

The VACC is calling for entries for its annual Target 2030 automotive design competition for students. Open to Victorian secondary and tertiary students, the competition brief is simple:

- Design a vehicle, or mode of transport, that will be used in the year 2030. It must be able to be driven on the road and it must be able to transport at least one person. Other than that, it is up to the students to use their imagination and creativity.
- There are three categories for students to enter – design, model-making and essay.
- All work completed from 1 August, 2011 will be considered for judging at the Awards Ceremony in July 2012.

VACC presents winning students and their school, college or university with equal cash prizes. Model-making categories winners receive \$3,000 each essay category winners receive \$500. Readers who know teachers or students interested in entering this competition should encourage them to visit <http://www.target2030.com.au/>



Nigel Remedios from Monash University won the Tertiary Model Making category in last year's Target 2030 automotive design competition.

## Fast accurate parts identification

The alliance between Schaeffler Automotive Aftermarket and product information system company TecDoc has resulted in production of the first Australian and New Zealand aftermarket LuK Clutch catalogue.

The standardised product data generated by TecDoc is updated every quarter and offered as a DVD or as an on-line catalogue. The TecDoc database currently includes approximately 2.9 million parts for private and commercial vehicles sourced from some 300 parts manufacturers worldwide, including Schaeffler's the LuK, INA and FAG brands. The TecDoc service includes on-line ordering system that works in tandem with the on-line cataloguing system.

TecDoc supplies the independent aftermarket with current and extensive data for the identification of spare parts for private and commercial vehicles all over the world. The system consists of a database, with current comparison numbers of co-operating parts manufacturers that is used by some 30,000 resellers and repairers worldwide to accurately allocate spare parts to vehicle types.

Schaeffler Automotive Aftermarket Business Development Manager for Australia, Pierre Marshall said: "TecDoc also allows Australian manufacturers of aftermarket components to take their products to the global aftermarket in a cohesive and standardised manner. We are very proud of the fact that Schaeffler Automotive Aftermarket is co-founder of this outstanding aftermarket industry resource. "Visit [LuK-AS.au@Schaeffler.com](mailto:LuK-AS.au@Schaeffler.com)

## FSA 500: empowered engine testing from Bosch



Power, flexibility, portability, and ease of integration are key features of Bosch's new FSA 500 diagnostic module, which will help streamline diagnostic processes and maximise workshop efficiency and profitability. With Bluetooth capability, the FSA 500 connects wirelessly to your workshop PC, or existing Bosch KTS scanner, streaming live data without the need for multiple cables across the workshop floor.

The 1.5 kg battery driven FSA 500 is easily transported around the workshop by hand, but is also trolley mountable to assemble a comprehensive workshop diagnostic package through integration of the Bosch KTS scanners, BEA gas analyser and FSA 050 hybrid tester.

Featuring approximately thirty preset component tests, CAN bus testing capability, a universal oscilloscope with two and four-channel modes, and the ability to store and save waveforms, the FSA 500 is an ideal platform for all standard diagnostic procedures. Visit [www.bosch.com.au](http://www.bosch.com.au)

*The Bosch FSA 500 diagnostic engine testing module*

## Calculate the cost of compressed air

Have you calculated the costs of supplying your workshop with compressed air?

With operational costs of a typical 37kW compressor operating for 4,000 hours a year at power costs of \$0.12/ kWhr totalling almost \$20,000 a year, any savings made can be considerable, particularly in a post carbon tax environment.

Southern Cross Compressors experience is that most customers focus on the capital cost of the compressor system. "Very few understand the long term operating costs of compressed air," said Southern Cross National Sales and Marketing Manager Mark Ferguson.

"The largest cost related to producing compressed air is in energy and this typically represents the highest energy usage in the business. With a new carbon tax around the corner, it's an area which workshops should address as a priority to achieve substantial potential savings," he said

According to Mark Ferguson, in recent years cheaper, lighter compressors featuring variable speed drives have entered the market in an effort to be seen as energy efficient. "While many demonstrate reasonable part load efficiency, other key factors tend to negate these savings contributing to higher costs in the longer term.

"Southern Cross offers the latest in technology built on traditional heavy duty design platforms with components produced to last. Features include direct drive with no air-end gears, additional bearings and larger bearing sizes, high efficiency TEFC - MEPS2 compliant motors, Schneider electrics, laminar flow intake controllers, large scale single pass controllers and stainless steel control lines and the solid piping or stainless braided hoses resulting in a long operational life," he said.

Southern Cross offers on site audits of customer needs. Visit <http://www.sccompressors.com.au>

## I-CAR appoints technical coordinator

I-CAR Australia CEO Richard Pratt has announced the appointment of well known instructor Mark Czvitkovits to the role of Operations and Technical Co-ordinator to be based at head office in Brisbane.

Ian Pratt said: "Mark is a highly qualified tradesman, who has been involved in various aspects of the collision repair industry. He joined I-CAR as one of its first volunteer instructors in 2006 and has delivered courses across the country. He also possesses tertiary qualifications in both business and education streams.

"I-CAR has grown substantially in the past year and the creation of a new role will provide greater support to the I-CAR instructor network, as well as focusing on the huge number of new technologies being introduced by vehicle manufacturers. There is no doubt that new repair techniques will continue to evolve and ensuring the accuracy of both the course content and the methodology required for correct repair is very much a full time role," said Ian Pratt.

I-CAR provides the industry's own accreditation program for ongoing training and education, across all roles in the industry. Visit <http://www.i-car.com.au>

## Gates timing component kits

Gates Timing Component Kits (TCK's) provide all the necessary components so that you can service the entire timing system for your customers, in one single package. One phone call, one package, everything you need!

Gates TCK's are available with water pumps for applications where the timing belt drives the water pump. Gates recommends that the water pump is replaced at the same time as the timing belt to avoid compromising the entire timing system should the water pump fail. If the water pump fails, coolant will leak and contaminate the belt. Long term coolant contamination will eventually lead to premature timing belt failure. Gates recommends checking the timing belt driven water pump while servicing the timing belt and other drive system components.

Gates has the most comprehensive range of timing component kits. Visit <http://www.gatesaustralia.com.au>



*Gates water pumps are designed for high efficiency, are recognised in the industry for their durability and superior quality, and are tested to ensure they provide optimum performance.*

## VSCCS streamlines modified vehicle assessment

New South Wales Roads and Maritime Services (RMS) have announced a new scheme to streamline the assessment of modified vehicles, which came into effect on 19 December 2011.

"The new Vehicle Safety Compliance Certification Scheme (VSCCS) is good news for RMS customers as it will provide them with certainty their modified vehicle is safe," Director Regulatory Services Peter Wells said.

"The new scheme does not change the existing vehicle standards, but improves the way vehicle modifications are checked and certified," he said. "Every modified vehicle owner has an obligation to ensure their vehicle complies in order to protect themselves, their passengers and other road users.

"The VSCCS will replace the current Engineering Certification Scheme. The old scheme is outdated and paper based, leaving it open to fraudulent certifications and missing records. Up to 30% of examiners previously were uninsured or under insured. The VSCCS will end

this problem. The new scheme will improve consumer protection, vehicle safety and provide greater certainty for all parties," he said.

Under the VSCCS, RMS will license qualified and skilled people to inspect modified vehicles. If a modified vehicle complies, the VSCCS certifier will provide a certificate which confirms the modifications meet standards. The VSCCS will also save time for the customer and provide greater convenience.

NSW Minister for Roads and Ports Duncan Gay has accepted an invitation from the Australian Confederation of Motor Clubs to attend the inaugural Motor Enthusiast Conference at the Eastern Creek International Raceway on Sunday 26 February 2012.

The Minister is keen to hear how the state government and its agencies can better work with and support motor enthusiasts in NSW in the future.

# THE CARS OF TOMORROW CONFERENCE 2012

Coping with the  
**RAPIDLY CHANGING**  
automotive landscape  
Melbourne \ 14 March 2012

Join the discussion on the progress and impact of upstart automotive technologies and fuels in the drive for low cost and low emission solutions.

What is their potential for success?

What will be the effects that a rush of technological alternatives might have on existing players?

How might companies position themselves to secure their futures in this changing environment?

A day of diverse and thought-provoking ideas and discussion with international and local experts:



### Conference Keynote

**Professor Neville Jackson**  
Chief Innovation and Technology Officer,  
Ricardo Group (UK)

### Ian Chalmers

Chief Executive, Federal Chamber of Automotive Industries

### Dr Jeffrey Helms

Global Automotive Director, Ticona Engineering Polymers (US)

### Ken Briggs

Applications Development Manager, BASF

“Now, more than ever before, the Australian automotive industry is faced with a highly competitive global market. This strong competition is not only between brands for customers, but also between countries for the skills, innovation and jobs that flow from a vibrant local car manufacturing sector. This is the challenge that faces the Australian auto industry, today and into the future.”

### The Fuel Dilemma

#### Mark McKenzie

Principal, Rare Consulting

#### Dr Victoria Haritos

Stream Leader - Fuels,  
CSIRO Energy Transformed  
Flagship

#### John Conomos AO

Australian Automotive  
Industries Envoy, Asia

### EVs When?

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