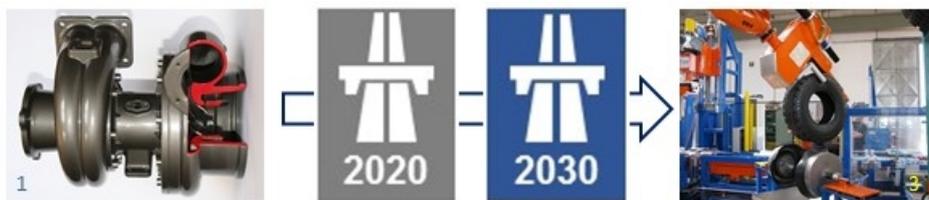


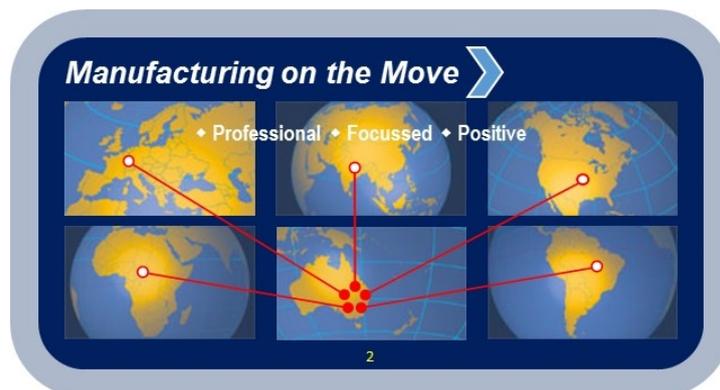
A 'New' Automotive Industry Future for Australia

[updated]



'Beyond Old Automotive Business-as-Usual'

Compiled by:



**Window on High-Value Manufacturing
in and from Australia**

July 2016

Background to 2016 update



Members of the ***Manufacturing on the Move*** [MotM] Leadership Group collaborated early 2014 on the compilation of '*A New Automotive Industry Future for Australia*' – a sector supplement to the preceding work '*Securing Australia's Manufacturing Future*'.

Much of the content released 24th February 2014 is still valid, such that we are republishing and adding this summary note on '2016 key factors':

- Fast forward from 'old automotive business-as-usual' the next place we land should be more than just 'new automotive'; specifically, the target market on ***MotM***'s Sectorscope™ is now identified as 'Transportation & Mobility'.
- Electro-Mobility is becoming mainstream, with existing and new companies being taken very seriously.
- It's possible that a big Establishment player – cutting corners on emissions – has given the ramping up of E-Mobility an extra nudge, but the momentum was already building.
- The customer base is not shrinking; it's all about accessible growth markets and our geography can now be turned to our (competitive) advantage – we are neither too small nor too remote.
- 'Commercial geographies' – production operations, supply chains and channels-to-market – will be quite distinct from the modus operandi of the first automotive century.
- Old-style assembly locations are no longer set in stone, and new manufacturing technologies are recasting supply chains and cluster configurations.
- There is non-stop attention paid to 'driverless' or 'autonomous cars' as a kind of cure-all and/or entry strategy to mobility markets for tech giants without an old automotive heritage.
- The technology challenges of 'driverless' may be do-able with currently available or near-term solutions, but the practicalities of 'cyber-infrastructure', mixed traffic systems and 'liability baggage' carried over from conventional automotive engineering mean that large-scale 'autonomous' is far from a done deal.
- That said, Australia having invented fast Wi-Fi and the black box Flight Data Recorder, surely has great credentials as a pro-activist in the operating infrastructure for E-Mobility: hacker-proof ultra-connectivity is coming.

Purpose of the 2014 Submission



To provide the Australian Government with a high-level 'snap shot' summary of the realistic prospects for a future Australian 'new' automotive industry presence in global markets.

1. Executive Summary

- The key to the development of a new Australian automotive industry lies with the realignment of our strong residual capabilities with the burgeoning new technologies that are driving automotive industry growth worldwide.
- Specifically, the engagement with our locally developed 'whole-of-vehicle' capabilities in niche military, high performance and electric vehicles will require the retention and continued up-skilling development of industry-specific professional, technician and high-level trade skills, and combined with vocational training expertise.
- Also fundamental is the rigorous assessment and actively encouraged development of accessible growth markets for high-value, locally developed automotive and associated electric, performance and military vehicle technologies, high strength and lightweight materials, telematics, current model as well as aftermarket automotive accessories, products, product-related services, components and assemblies.

2. Context

The key to automotive industry capacity building for 21st century markets will lie in quick reflex positioning for radical technological change and maximising 'early mover benefits' with particular reference to pre-empting new electric power train, alternative fuels, emerging value-adding, application of lightweight materials sciences, additive manufacturing, industrial robotics and emerging hybrid processing for new materials – as well as the connectivity and integration of vehicle communication systems.

This is particularly relevant to military vehicles where the US Administration is already on record as advising their military vehicle suppliers of the need to cut 30% weight out of future military vehicles and land warfare platforms. These requirements mandate that their Army vehicles consume less fuel, undergo significant weight reduction, have a reduced logistics footprint, and require less maintenance, while maintaining or increasing payload capacity and other key performance criteria.

Electric and hybrid military vehicles, multi-fuel options and the full spectrum of new high strength and light weight material sciences, ballistic protection, electronic warfare and cloaking material research all provide opportunity for an Australian technology and science-linked manufacturing dynamic.

'Old' Automotive is making way for '**New Mobility**' and a 'once-in-a-generation' window of opportunity to deliver wins to create sustainable new industry capacities, the development of new skills and capabilities to fill newly created jobs as well as the establishment of new markets and enhanced bilateral trade through the application of new technologies, clever design and IP-led manufacturing.

At the core of 'New Mobility' are game changing advances in 'E-Mobility' ('Electro-Mobility') - a 'whole-of-vehicle', locally developed capability which encompasses highly efficient CSIRO developed 'E' motors and transmissions, lightweight, high-strength carbon composites and break-through cost-down titanium structural and power train components, ICT driver assistance technologies, vehicle control and traffic systems, and – crucially – a range of clean and/or hybrid energy options.



3. The Need for a 'New Engine' to Drive Australian Manufacturing

With the recently announced departure by 2017 of all overseas-owned automotive OEMs, Australia's manufacturing supply chain capability has now been put at considerable risk. The residual automotive industries and capabilities, however, remain highly significant. Apart from the automotive components sub-sector, Australia has a strong SME aftermarket capability that includes bespoke vehicle manufacturing and conversions, performance tuning equipment and classic car rebuilding as well as renovations, specialist performance and 4WD accessories, replacement spare parts and associated engineering services of all types. Australia also has had a relatively small, but very capable, specialist military and mining vehicle sub-sector and a burgeoning niche specialist ICT / telematics industry.

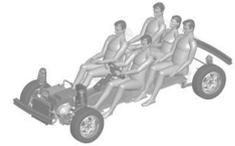
The use of lightweight materials also has the potential to help our defence forces meet anticipated considerations of the recently proposed 2014/2015 Defence White Paper towards similar goals as now being adopted by the US in the areas of weight reduction and fuel consumption. Materials such as titanium and advanced carbon and aramid composites are also corrosion-resistant and long lasting, which reduces maintenance requirements. Titanium use, particularly with enormous benefits as a high-strength lightweight material, has applications as diverse as appliqué armour, structural and engine components, and has benefited from significant 'cost down' research and manufacturing process development by the CSIRO that can now move traditionally 'exotic' materials into a cost-efficient, mainstream manufacturing option.

Australia also has a recognised world-class capability in the design, construction and development of high performance motorsport vehicles which can also be recognised as a strategic defence capability evidenced by the UK Formula 1 and motorsport design heritage in the recently acquired Australian Army 'Nary' patrol vehicle. This illustrates some opportunity for Australia to now employ advanced composites and lightweight high-strength materials in the design and manufacture of long-range, high performance military patrol and reconnaissance vehicles.

Relatively new niche automotive manufacturers such as Special Heavy Vehicles (SHV) of the Bryon Group provide innovative solutions. Utilising the latest technology and innovative designs, SHV has been providing special heavy vehicles e.g. ambulances, corrective service and aircraft support vehicles.

Critically, Australia does currently possess a broad-based advanced automotive design and engineering resource that is potentially capable of rapid development towards a 'New Mobility' sector, which, with Defence and Aerospace, would be at the 'cutting edge' of a refreshed and transformed onshore manufacturing industry.

4. Automotive Markets and Recent History



4.1 Domestic

- In 2004, four mainstream OEMs combined to build more than 400,000 new vehicles in Australia. Post GFC, three OEMs have struggled to build and sell 220,000 vehicles per annum.
- The Australian new vehicle market is holding up well at >1 million units per annum, but the share of home produced cars has been declining as a result of (with the possible exception of Toyota) perceived aging models, changing demographics, an increased choice of imported vehicles, new emerging segments and fuel economy.

4.2 International

- Light Duty Vehicle demand worldwide is on a massive growth trajectory from 2002 to a 2030 projection requiring an ultimate supply capacity boost in excess of 50 million units per annum.
- Some major OEMs, e.g. GM in Europe, have surplus capacity in the wrong locations as well as model and branding handicaps, meaning that the true forecast required to service the new growth markets will actually be greater than the above figure.
- Of this fast expanding global demand and prospective market, 75% is forecast to occur in the non-OECD regions in Asia that represent important markets for Australia in the 21st century.
- These market size projections alone indicate that just a small but very significant and sustainable Australian niche presence in global market high-value, high technology automotive components, products and product-related engineering services is a realistic target.
- The new markets are not only larger but also different. Factors driving overall market growth include population increases, accelerating urbanisation, increasing prosperity and mobility needs, de-polluting metropolitan centres, reducing the dependence on fossil fuels, and moving towards cleaner alternatives.
- Factoring into the international market is the burgeoning (85% projected growth for 2014) growth in vehicles with an electric and hybrid power train. While 380,000 highway capable 'plug in' electric vehicles is not a large proportion of the world car market, it demonstrates that electric vehicles (EVs) are in the process of breaking through the credibility barrier with early adopters expressing high degrees of satisfaction with their purchases. EVs are well on track to beat conventional vehicles in terms of total costs of ownership by the end of this decade (e.g. a 40% reduction in the cost of lithium-ion battery packs since 2009) and addressing air quality issues in major cities can only add to the uptake.
- Associated with the significant projected increase in the global vehicle market is the increased demand and rapidly developing 'trickle down' of telematics technologies from the US and European markets to the burgeoning Asian market volume opportunities.
- In the vanguard of the developments of these vehicle networking technologies, automatic voice recognition and automotive infotainment, as well as vehicle safety, have been early mover Australian companies Cohda, Intelmatics, and Adecel. Adecel, significantly, will also supply AVR technologies for the Lockheed Martin F-35 JSF development.

5. Window and Timing of Realistic Opportunities



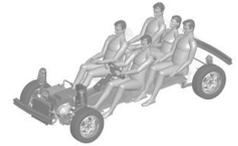
- 5.1 It is quite feasible for Australia to create a lead presence in rapidly expanding markets for electric 'near zero-emission' vehicles. The early establishment of an **'EV Readiness Industry Forum'** (that would examine and report on manufacturing industry opportunities, issues and pathways associated with an automotive 'Move Electric') represents one key initiative that could have considerable merit, if approached with a strong market perspective.
- 5.2 There is a window of opportunity for the Australian manufacturing industry to demonstrate and apply strong capability in advanced composites and light-weight, high-strength materials towards involvement in not only any new Defence vehicle projects, but also global supply chain opportunities in the traditional automotive industry.
- 5.3 In addition, a **strong industry-led initiative established in automotive telematics** requires both recognition and support in terms of additional pure and applied research development to reinforce and maintain this technological 'front runner' position.
- 5.4 Markets and prospective competitors are constantly on the move. It is imperative therefore that **relatively small, decisive and progressive steps are promptly initiated to investigate, research and implement a forward looking, 'new automotive', industry capability road-mapping program and an action plan for implementation.**
- 5.5 The future Australian manufacturing industry, and no less a new invigorated automotive sector, will be about rapid response, quality, flexibility, design, create-and-build innovation, skills, networks and critical mass. This **new type of business model demands a collaborative team approach** and much improved communications on consensus objectives at local, regional, state and national levels.

Accordingly we need to rapidly **acquire knowledge about newer industry collaborative aspirational and cluster models.** Therefore, two questions need to be addressed:

1. How do industry, education and vocational skills training, research institutes and universities collaborate in these newer teamings?
2. How can templates and protocols be developed to optimise and enhance these relationships?



6. People Behind This Submission



This submission derives from an industry-driven, E-media-generated initiative, developed as a result of dialogue and engagement via **Manufacturing on the Move** – an outcomes focused network comprising highly-engaged professionals and leaders with a strong focus on Australian manufacturing.

This automotive manufacturing perspective has been devised and compiled from contributions by the following Founder/Managers of **MotM**, drawing on extensive experience in the manufacturing sector and broader industry understanding:

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This initiative is endorsed by the Founder/Patron of **Manufacturing on the Move**, Bruce Grey.

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