

Dear Commissioners Woods and Weickardt,

Please find my third submission to the Review of the Australian Automotive Manufacturing Industry. The aim of this submission is to provide answers to the questions asked in the Commission's Position Paper, and to provide further suggestions that can be considered for the Final Report.

I am a senior lecturer at Deakin University but this submission does not necessarily reflect the views of the University.

Best Regards,

Frank Will

Summary of Recommendations:

1. Establish a dedicated research fund for radically new light vehicle concepts for personal mobility, similar as under the EU Horizon 2020 program with its EURO 129 million budget for such vehicles.
2. Establish a bilateral scientific and technological agreement or any other arrangement between with the European Union to enable Australian companies and research institutions to access to the EURO 70 billion budget of the Horizon 2020 program.
3. Establishing a Venture Capital Fund dedicated to Automotive Innovations, similar as for biotech or renewable energies.
4. Imported second vehicles should be certified for exhaust emissions and fuel consumption by independent accredited testing laboratories, similar as required under RAWS scheme, but according to the standard at the year of the planned import.
5. An up-skilling program should be designed to encourage automotive employees to enrol in university courses, TAFE courses and English courses.
6. Assistance should be provided for automotive employees to be trained in the systematic process of inventing and commercialising new inventions.
7. Invest in the foundation of a consortium to develop, build, and commercialise the world's first mass produced leaning car, similar as Tesla Motors for electric vehicles.

1. Is further industry-specific assistance warranted?

This question is asked on page 7 of the Position Paper /1/. During the global financial crisis all 3 American car manufacturers asked the US Government for assistance. Assistance was provide in form of loans on the condition for the car manufacturers to present business plans that showed long term financial sustainability and in particular how they were going to develop more innovative, efficient and clean vehicles that customers really want, even during difficult economic times. The car

manufacturers responded more or less appropriately and received the needed support which helped them to avoid bankruptcy and to become profitable again.

In comparison, in December 2013 the European Union (EU) announced a 2014 budget of EURO 129 million for investments into research related to green vehicles. One of the 6 line topics are “**Electric two-wheelers and new ultra-light vehicle concepts**” /2/. Key characteristics of that call are

- Expected contribution from the EU of between EUR 5 to 8 million per proposal
- Funding rate: 100%
- Legal entities established in countries not listed and international organisations will be eligible for funding: When funding for such participants is provided for under a **bilateral scientific and technological agreement or any other arrangement between the Union and an international organisation or a third country**.
- The challenge is to “investigate **radically new light vehicle concepts for personal mobility** in urban areas”.
- “The scope also includes the development and proof of concept of new ultra-light vehicles for passengers”
- “and considering any **necessary changes to homologation requirements and regulations** to allow their use.
- The project results will be validated through demonstrators

That clearly demonstrates that Europe is determined to become a leader in the area of radically new ultra-light vehicle concepts and is prepared to implement regulative changes to support the fast adoption of such vehicles. This also answers the INFORMATION REQUESTS 2.1 and 3.1.

Recommendation 1

Develop a similar framework like in Europe to invest in the development and commercialisation of such new types of light weight commuting vehicles. The market for such vehicles is only at its infant stage mainly to the difficulties in developing the enabling technologies. Any country that can lead the development of such enabling technologies and can secure the relevant IP will become a major player in this future global growth segment.

The framework should include an adequate amount of research funding for a limited duration, to continue until 2020, similar to the ATS. The funds could come for example from savings of the ATS budget. Alternatively it could come from the \$100 million growth fund that was recently announced by the Liberal Party in response to Holden’s decision to cease making cars in Australia /4/.

Recommendation 2

Establish a bilateral scientific and technological agreement or any other arrangement between with the European Union to enable access to the EURO 70 billion budget of the Horizon 2020 program for Australian companies and research institutions. This can be seen as a Free Trade Agreement with the European Union related to research funding. With the track record of Australian research that produces around 3% of all scientific papers globally compared to only around 1% of the global GDP it should be possible benefit significantly from such an agreement.

2. Can special adjustment packages cost-effectively facilitate adjustment? (page 25 /1/)

This will depend on the details of the packages, as with any initiative. The Position Paper refers to examples where the value of such packages was questioned. However, if principles like those of private investors will be applied, it should be expected that such packages can be as successful as private investments. There are some examples of investment packages that are matched with private investments to support the growth of other important industry sectors.

For renewable energy technologies several dedicated funds are available, for example the Renewable Energy Venture Capital Fund (REVC) delivered by the Australian Renewable Energy Agency (ARENA) with a \$100 million investment from the Commonwealth that will be matched dollar for dollar by Softbank China Venture Capital. For Biotech the Queensland Government invested US\$25 million investment into the Biotech Fund.

If the Commission “raises questions about the ability of governments to successfully ‘pick winners’”, then it would be beneficial to develop processes to help governments in their decision making process how to pick winners by learning from past experiences.

Recommendation 3

Establishing a Venture Capital Fund dedicated to Automotive Innovations. Automotive innovations require a similar research and product development duration compared to other investment intensive sectors like biotech or renewable energies. Therefore a Venture Capital Fund dedicated to Automotive Innovations should be initiated, similar to the Renewable Energy Venture Capital Fund. Such a fund would also help to attract foreign investors and could result in global suppliers and or OEM's to co-invest in Australian automotive innovations. The funds would perfectly match other Government programs like Commercialisation Australia, R&D Tax incentives and Export Market Development Grants to provide the required matching funding so that the valley of death in the commercialisation process can be crossed without starvation.

3. INFORMATION REQUEST 3.2 Removing restrictions on the large-scale importation of second-hand vehicles: How could compliance with Australian safety and environmental standards be most efficiently ensured?

Compliance with the spirit of the standards is already an issue with many of the new vehicles that are currently imported into Australia, as mentioned in the previous submission. There is already a framework available that regulates the imports of second hand vehicles: The Registered Automotive Workshop Scheme (RAWS) that “allows for the importation and supply of used specialist or enthusiast vehicles to the market in Australia” /3/. However, in this scheme the vehicles only need to meet the emission standards of the time when they were built. That means that if the same scheme would be adopted for any type of vehicles, it would be very likely that those vehicles would emit significantly higher emissions compared to new cars that are imported into Australia, which is not really desirable, particularly when other countries initiate scrap schemes to remove vehicles that produce high emissions and that are older than 10 years, to stimulate their industries and to improve their air quality.

Recommendation 4

Imported second vehicles should be certified for exhaust emissions and fuel consumption by independent accredited testing laboratories, similar as required under RAWs scheme. However, in contrast to the RAWs scheme, these “non-specialist or non-enthusiast vehicles” should meet the current emission standards at the time when they will be imported into Australia. This ensures that only relatively clean second-hand vehicles will be imported into Australia, and perhaps even cleaner than the current Australian emission standards. To find enough eligible second-hand vehicles should not be a problem because exhaust emission regulations in Australia lag around 5 years behind Europe, the USA, and to a certain also Japan, and are more comparable to emission limits in China and India.

4. INFORMATION REQUEST 5.1 The Commission is seeking further information on options for designing adjustment assistance programs for automotive manufacturing employees and regions affected by structural adjustment

The Position Paper reports that the employee qualifications in manufacturing – and specifically automotive – are significantly lower compared to the average of all industries, particularly related to tertiary education, English skills etc. If the Government expects companies and employees to be innovative so that they can be globally competitive in the future, particularly engineers need to be trained how to become innovative and how to invent new solutions to existing problems. Even though problem solving is a major part of engineering courses at any university, in most cases this doesn't foster the creation and development of innovations.

In our Product Development unit at Deakin University we teach techniques how any student can make new inventions and in Managing Innovations the students are shown how to commercialise such new inventions. Both of these units are available on-line for distance learning / off-campus students. Deakin University also provides the flexibility to only enrol in single units without the need to enrol in a complete course.

Recommendation 5

An up-skilling program should be designed to encourage automotive employees to enrol in university degrees, TAFE courses and English courses. The course fees could be paid initially (until 2020) through the savings of the ATS scheme. During the first years the employees could enrol part time to minimise the risk. To allow the enough study time the employment contracts should be converted to part time. The lost income of such part time arrangements could be shared equally between the employee and the employer, ideally some of that lost income could also be financed by savings of the ATS scheme.

For the time after 2020 it should be enabled for employers to write off the wages for the study time given to the employee as an investment in future capabilities. This is a similar investment as the government makes into other forms of education.

Recommendation 6

Assistance should be provided for automotive employees (and perhaps manufacturing employees in general) to be trained in the systematic process of inventing and commercialising new inventions to increase the competitiveness of both, the employing companies and the employees.

In a next step it is suggested to include these topics as standard units into any engineering course.

5. Second Update on Proposal for Australian Leaning Car Consortium

Until now 22 organisations have expressed interest in being part of that consortium and decisions from further 12 organisations are expected soon. Furthermore Deakin University conducted a market research study to identify

- Potential impeding features of such a vehicle
- The most- and least attractive features
- Relevant open minded demographics and target markets.

A total number of seven focus groups were conducted including:

- Australian Females (mixed age, pilot study)
- Australian Males (mixed age)
- Australian Females (mixed age)
- Indian Male Deakin Students
- Indian Female Deakin Students
- Chinese Male Deakin Students
- Chinese Female Deakin Students

The results were very positive, many of the participants immediately wanted to buy the vehicle if it was available. The most significant impeding factors were the overall appearance and the associated safety performance of the vehicle when compared with a car. That was not surprising as firstly the images that were shown at the time were intentionally produced to explicitly not include typical styling elements as the question was to identify potential impeding features or functions and to exclude styling preferences. Furthermore the vehicle was shown in green colour to reiterate the low emissions and low fuel consumption. However, all participants easily understood those benefits but many just didn't like the green colour.

The lower associated safety performance compared to a car was also not a surprise as the vehicle is smaller than a car and even smaller cars often perform worse in some crash scenarios compared to larger and heavier cars. Nevertheless, the participants also understand very easily the significant safety benefits compared to motorcycles and scooters. To demonstrate some of the safety benefits compared to even conventional cars further research is needed including simulations and more expensive real crash tests.

Another important element of the proposal is the disruptive game changing business model that has the potential to transform the complete industry, similar as social media like Facebook revolutionised the way people communicate with each other. Table 1 compares how Facebook changed 6 major elements of the business model that was dominant before the arising of social

media. This is compared with exactly the same 6 major elements related to cars and how such new leaning vehicles will generate similar benefits like Facebook.

	Social Media	Narrow Leaning Vehicles
Replacing	e-mails and trips to meeting people	cars, motorbikes and scooters
Easy	information sharing	parking through minimal footprint
Time Saving	through instant messaging	through lane sharing
Cheap	the only cost is sharing private information	low cost for energy & parking, no purchasing cost
Income	via advertising instead of subscriptions	via subscription instead of vehicle purchases
Co-ownership	by employees	by customers

Table 1: Major elements of disruptive game changing business models

To stress the significant export potential it should be mentioned that there is also a similar range of diverse body versions possible, similar as for most cars, which demonstrates a large scalability that multiplies the market opportunities, for example

- 1-, 3-, 4- Seaters
- Station Wagon
- SUV / ATV – Off Road
- MPV
- Hatchback – Notchback
- Coupe
- Convertible
- Roadster
- Speedster
- Van
- Pedal electrics
- Mobility scooter for disabled

Proposal 7

Invest in the foundation of a consortium to develop, build, and commercialise the world's first mass produced leaning car to demonstrate the competitiveness of Australia's manufacturing industry to the world. Break-even is expected after 10 years, similar as for Tesla Motors, which demonstrated that electric vehicle can be built in a profitable way.

References

/1/ Productivity Commission, Australia's Automotive Manufacturing Industry, Position Paper, 2014

/2/ HORIZON 2020 WORK PROGRAMME 2014 – 2015, 11. Smart, green and integrated transport, European Commission Decision C (2013)8631 of 10 December 2013,

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2605-gv-5-2014.html#tab1>

/3/ Australian Government, Department of Infrastructure and Regional Development

<http://raws.infrastructure.gov.au/>

/4/ The Hon. Tony Abbott MP Prime Minister, Securing Australia's Manufacturing Future, December 2013 <https://www.liberal.org.au/latest-news/2013/12/18/securing-australias-manufacturing-future>

/5/ Frank Will, James Nicholas Davidson, Paul Couchman, David Bednall: Tomorrow's Car – for today's people: can tilting three wheeled vehicles be a solution for the problems of today and the future? SAE 2011-28-0001, APAC Conference Chennai, 2011