RESEARCH THEME: POWERTRAINS, FUELS & EMISSIONS

ELECTRIC VEHICLE CONTROL SYSTEMS AND POWER MANAGEMENT

The project involves several doctoral projects on electric vehicle technology at Swinburne University of Technology. The work will be carried out jointly with Hefei University of Technology (HFUT) located in Hefei, Anhui Province, China.

Project Leader Prof Ajay Kapoor
Swinburne
P: 613 9214 8202

Project Participants Swinburne

VOLUME EFFICIENT HIGH PRESSURE STORAGE VESSELL

The objective of this project is to develop novel system design and manufacturing solutions for high pressure gaseous fuel storage for automotive applications to achieve a range close to that expected in conventionally fueled vehicles.

Project Leader Dr Paul Compston
ANU
P: 612 6125 8614

Project Participants ANU

HIGH DENSITY GASEOUS FUEL STORAGE

This project aims to determine the feasibility of increasing the storage density of gaseous fuels at low and high storage pressures.

Project Leader Dr Matthew Hill
CSIRO
P: 61 3 9545 2841

Project Participants GM Holden
CSIRO

ELECTRIC VEHICLE DRIVETRAIN

This project aims to develop Electric Vehicle (EV) drivetrain and storage integration that can be applied to existing vehicles for hybrid EV and full EV conversion and used for new EV and hybrid vehicles.

Project Leader Dr Howard Lovatt
CSIRO
P: 612 9413 7412

Project Participants Swinburne
CSIRO
La Trobe
VPAC

LIGHTWEIGHT INTERIORS

This venture brings together the technology, skills and capability to enable the creation and production of composite car interior products (initially seating) that provide all the functional benefits (including weight savings) of composites but also competitive in price to existing general use products.

Project Leader Dr Niall Finn
Deakin
P: 613 5246 4831

Project Participants Futuris
CSIRO
Deakin

LIGHTWEIGHT MODULAR VEHICLE PLATFORM

This project takes a “modular” approach to the vehicle lightweighting challenge. The resulting design aggressively reducing weight in the various modular components of the vehicle body. Although engine fuel efficiency has steadily improved over the past decade, fuel economy of typical vehicles has largely plateaued due to increasing vehicle mass. A key enabler for real world reductions in fuel consumption is reduced vehicle mass.

Project Leader
Matthew Dingle
AutoCRC
P: 613 9647 7862

Project Participants
ANU
Deakin
RMIT
Swinburne
VPAC

APPLICABILITY OF ELECTRIC VEHICLES

The uptake of electric vehicles (EVs) in Australia will provide many opportunities for the development of new products and services to support these vehicles. This project will identify key factors in Australian travel behaviour, vehicle and recharging infrastructure requirements that will influence the uptake of EVs and make recommendations.

Project Leader
Dr Rocco Zito
UniSA
P: 618 8302 1863

Project Participants
UniSA
DTED (SA)

SMART CHARGING OF ELECTRIC VEHICLES

The introduction of Electric vehicles in Australia will create new demands on energy infrastructure. At the household and business level, the competing energy demands of essential and non-essential systems will require “smart” technology to accommodate these demands while enabling convenient EV charging. This project will study the energy requirement “signatures” at the household/business level and develop models and strategies for enabling smart charging of EV within an energy-constrained scenario. A number of Australian businesses have expressed interest in this area and are considering developing commercial products and services using the research outcomes.

Project Leader
Peter Pudney
UniSA
P: 618 8302 3457

Project Participants
UniSA
DTED (SA)

ZERO EMISSIONS ELECTRIC VEHICLE INFRASTRUCTURE

The electricity used to recharge the batteries of electric vehicles must be generated from clean sources in order to avoid the greenhouse gas pollution produced by fossil fuelled power stations. The aim of this project is to design, build and test a prototype heat engine, with a 50kW electrical output, that can be scaled up to a 1MW commercial unit for recharging electric vehicles.

Project Leader
Prof Chris Dixon
RMIT
P: 03 9925 6091

Project Participants
Air Thermal
RMIT

PLANNING FOR ELECTRIC VEHICLES IN AUSTRALIA - *completed, contact AutoCRC for details*

The project will lay the foundation for the introduction and use of electric vehicles in Australia. An important aspect of the project will be the preparation of an implementation plan, in conjunction with the industry partners, for conducting a full scale electric vehicle trial in Adelaide.

Project Leader
Michael Taylor.
UniSA

Project Participants
DTED
UniSA

HEAVY TRUCK LPG CONVERSION PRODUCTIVITY SYSTEM - *completed, contact AutoCRC for details*

The scope of this project is to develop a commercial 100% LPG Heavy truck (B-double configuration) which is fully integrated with a CAN based fuel measurement and engine diagnostics system with server based engine performance and fuel reporting. The project will also aims to reduce LPG truck fuel consumption by 10%, optimise reliability through combustion and engine management improvements, reduce noxious emissions and reduce GHG by at least 10% and particulate matter by at least 90%

Project Leader	Chris Seeling VPAC	**Project Participants**	GM Holden

AERODYNAMIC OPTIMISATION TO IMPROVE FUEL ECONOMY - *completed, contact AutoCRC for details*

The aim of the project is to develop a computational analysis process for evaluating and optimising the aerodynamic drag of vehicles. A key benefit of this will be improved fuel economy. The project will consider external, underbody and underhood areas of vehicle design. One key deliverable from the activity will be the documented and qualtified steps a design engineer should follow to achieve an optimised aerodynamic result of future vehicle designs.

Project Leader	Chris Seeling VPAC	**Project Participants**	GM Holden VPAC

FORCED AERODYNAMIC CONTROL - *completed, contact AutoCRC for details*

This feasibility study will assess the utilisation of fans to improve fuel consumption in production passenger vehicles by reducing drag. This has the potential to decouple aerodynamic design from styling design. A scale model will be built and wind tunnel tested and energy and cost audited.

Project Leader	A/Prof Simon Watkins RMIT	**Project Participants**	GM Holden RMIT

THE DUOLETA LIGHTWEIGHT VEHICLE - *completed, contact AutoCRC for details*

The project objective is to determine technical and commercial feasibility for the Australian production of an ultra lightweight vehicle. A preferred concept will be generated as part of the project addressing the primary objectives relating to weight, fuel consumption, performance, cost, safety, manufacturability and environmental impact. The study will produce strategies for detail design, development and testing, manufacture, assembly and distribution.

Project Leader	Robert Speedie UniSA	**Project Participants**	CSIRO DTED(SA) UniSA