



# DRIVING INNOVATION

## THE RENEWABLE ENERGY VEHICLE (REV) PROJECT AT THE UNIVERSITY OF WESTERN AUSTRALIA IS TRANSFORMING THE WAY WE POWER OUR CARS



**Kate Cullen**

**JOB: Final-year Bachelor of Commerce (economics and engineering science) student, UWA**

**SOLVING PROBLEMS AND** building things are compatible pastimes for most budding engineers, says student Kate Cullen. While she didn't always know she wanted to be an engineer, she was good at maths and science and saw engineering as "the most practical and employable way of using those skills".

Kate intends to follow up her Bachelor degree with a UWA Master of Professional Engineering, to become a professionally accredited engineer. She chose to specialise in mechanical engineering because it offers a diverse range of career options – for instance, in the renewable energies industry, which she is particularly interested in.

"It's not that I want to go out and save the world," she says. "I just think it would be a good, guilt-free industry to work in. Renewables are on their way to becoming economical." – Gemma Chilton

**W**hen UWA's REV Project was launched, no commercially available electric vehicles (EVs) existed. Today, several major car manufacturers have EVs in their line-ups – an impressive shift thanks to researchers such as those at UWA.

The REV Project was established to find sustainable transport alternatives in the face of climate change, air pollution and rising fuel prices. According to project director Thomas Bräunl, of the School of Electrical, Electronic and Computer Engineering, sustainable transport was a natural fit for UWA given the university's reputation in the field of sustainability and its position at the cutting edge of mechanical engineering.

The project's first milestone was the development in 2008 of a road-licensed EV based on a Hyundai Getz, followed by an electric racing car, the Lotus Elite, in 2009–2010. The researchers also conducted Australia's first EV trial, from 2010–2013, using converted Ford Focus sedans driven across Perth by various organisations, councils and corporations.

In recent years, with EV technology increasingly embraced by car makers, the researchers' focus has shifted to charging technology.

"That's going to be the next big challenge," says Thomas. "Once you have a certain percentage of all cars being electric, it will have an impact on the electricity grid, and we'll need to ensure a smooth transition."

As part of an Australian Research Council project during 2010–2015, the researchers developed Australia's first network of commercial fast-charging stations across Perth. Most of these stations can fully charge trial EVs in three hours – while the more powerful DC fast-charging stations in the network can charge EVs to 80% capacity in just

20 minutes. This latter technology could be game changing when it comes to commercial viability because the EVs are not left parked in the charge stations for so long.

In another important piece of research, PhD scholarship recipient Stuart Speidel developed an award-winning software program called REView, which collects data from EVs, charging stations and renewable energy resources, then collates and presents the results to users.

"By illuminating users' patterns, we can motivate them to reduce their carbon emissions," says Stuart. "I was involved in all aspects of the project, from constructing and maintaining EVs and stations to monitoring them remotely. I was also involved in writing servers to collect the data and software to automatically analyse and display it."

"There's no doubt about it," says Thomas. "The industry agrees that within the next few decades the vast majority of cars on the road will be electric." – Gemma Chilton

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