bridging the gaps
Sustainable Urban Spaces

Escalator Fund

UCL

Optimising the design, performance and use of electric, fuel cell and hybrid vehicles

(A new low-carbon vehicle collaborative network for UCL)

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Low-Carbon Vehicle Research at UCL

The broad range of engineering, science and policy activities in the area of transport and low-carbon vehicles makes UCL potentially one of the strongest centers of such research in the UK. One of the main objectives of this project was to bring together the researchers active in this area by 'bridging the gaps' between the Faculties and Departments. Figure 1. shows the range of scales (size and power) over which the UCL team involved in this project are involved. This represents a truly 'molecules to systems' (and beyond) range of expertise.

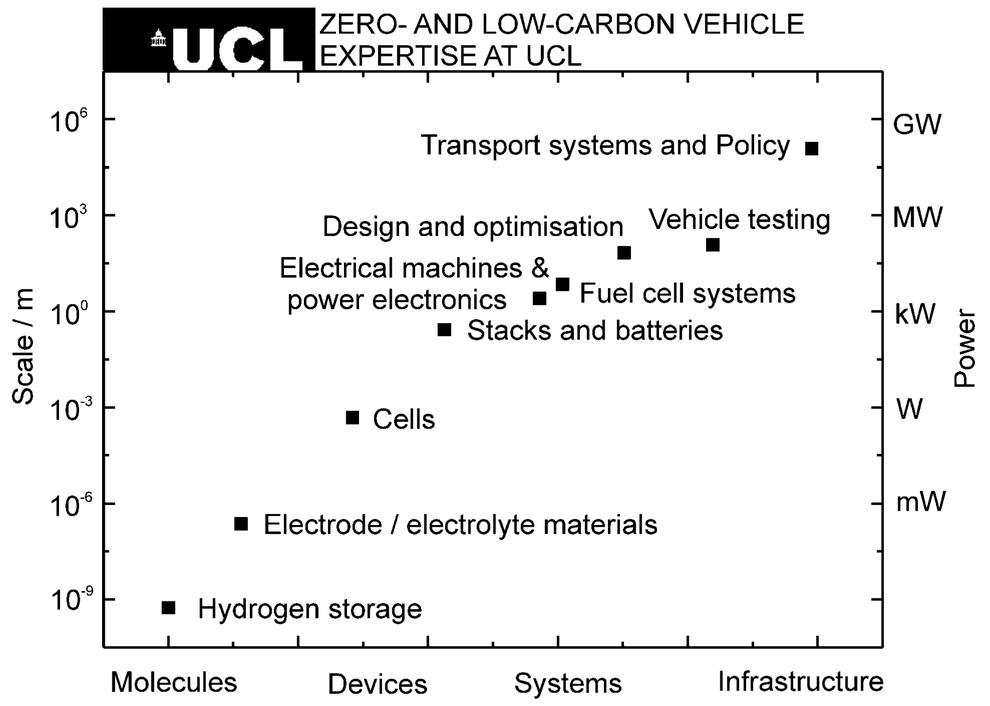


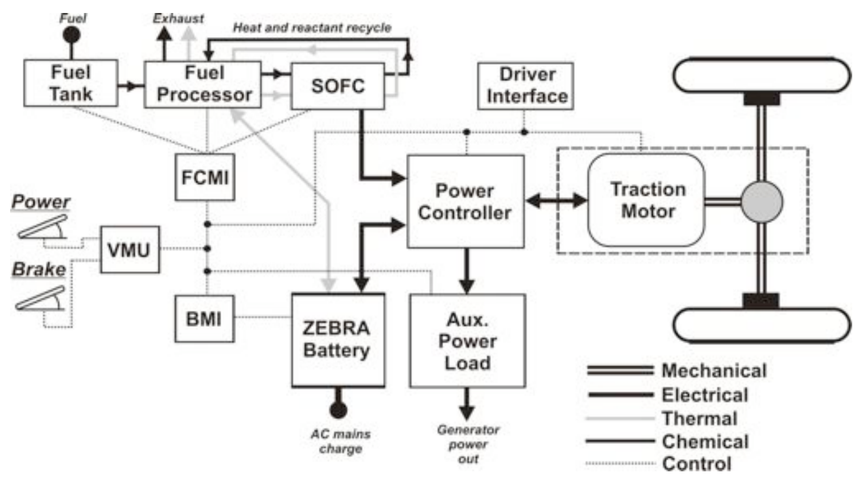
Figure 1 Low-carbon vehicle expertise at UCL spans 'molecules to systems'

Figure 2 UCL Low-carbon vehicle delegation visits China for high-level talks with industry and government

Developing Links in Low-Carbon Vehicles with China

Sponsored by the Chinese Ministry of Science and Technology (MOST) and Bridging the Gaps, a delegation of UCL academics involved in this project visited China in January 2011 to strengthen and develop new links with Chinese companies and government in the area of low-carbon transportation and biofuels.

Following this very successful visit, arrangements are currently underway to formalise research collaborations with UCL.



Vehicle design and Optimisation

The technical programme associated with this work is composed of: **Part 1.** Generate a computational modelling platform for the multi-objective optimisation of LCVs. **Part 2.** Identify actual and potential advantages of LCV technologies for the advancement of vehicle design. **Part 3.** Use the optimised design based on the design specifics to generate the conceptual blueprint for potential future designs.

Figure 3 shows how new vehicle powertrains are being developed that take advantage of the properties of alternative electrical power sources to improve efficiency an travelling experience. Here, a solid oxide temperature fuel cell is hybridised with a high temperature battery to achieve greater efficiency and fuel tolerance.

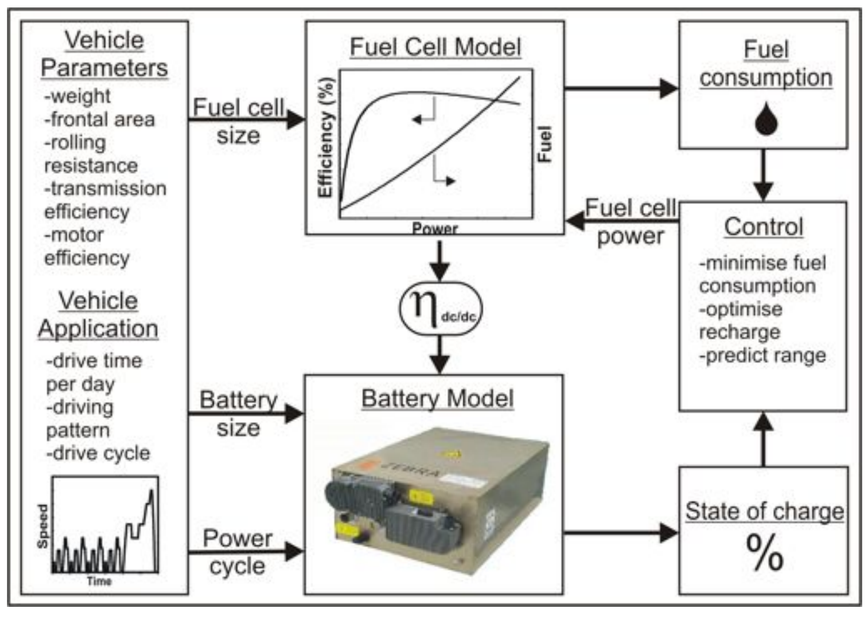


Figure 3 Novel hybrid vehicle powertrain (top); modelling and optimisation framework (bottom)