Powertrain Architecture Selection

For EcoCAR the NeXt Challenge

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Objective:

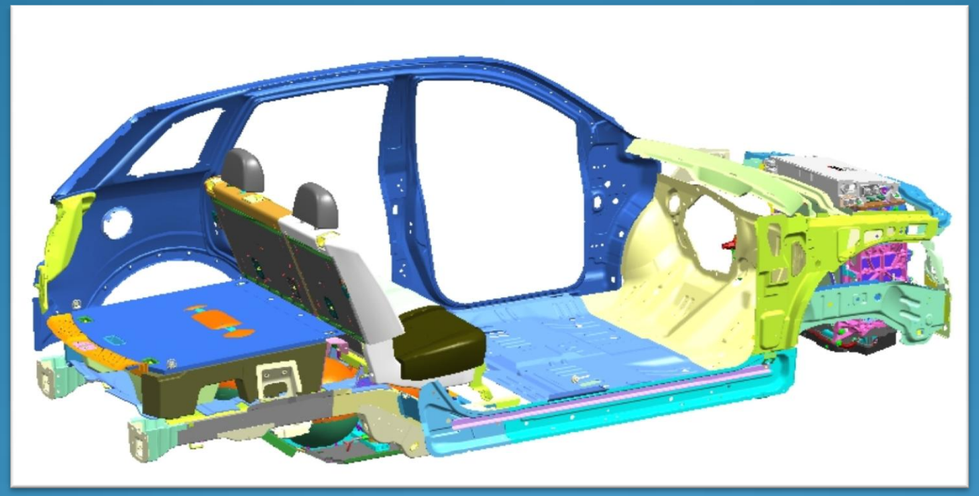
Design and develop powertrain architecture for General Motors new 2009 Saturn VUE EcoCAR. This project is in conjunction with EcoCAR: The Next Challenge Competition. Design must meet competition requirements and DOE Argonne National Laboratory guidelines

Future Developments (Missouri S&T EcoCAR team):

- Develop powertrain control strategy to enhance performance
- Design DC/DC converter
- Weight Reduction
- Component Packaging (H2 tanks, Battery, and Fuel Cell Assembly)

Design Requirements

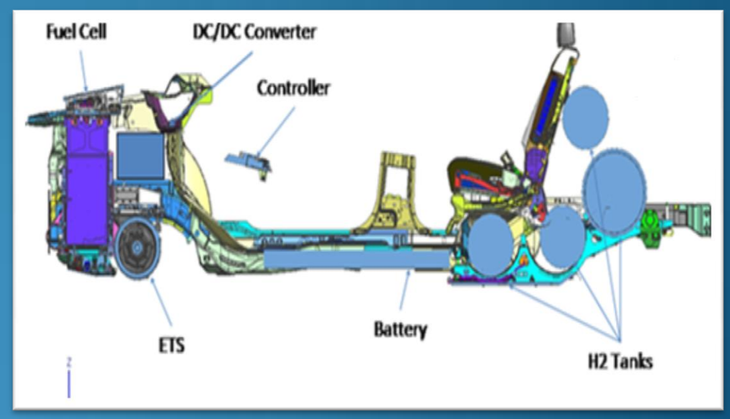
Specification	Competition		
EcoCAR	**Production VUE**	**Competition Requirement**	**VTS**
Accel 0-60	10.6 s	≤14 s	9.8
Accel 50-70	5,7 s	≤10 s	5.8
UF Weighted FE			
Towing Capacity	680 kg (1500 lb)	≥680 kg @ 3.5%, 20 min @ 72 kph (45 mph)	680 kg @ 45 mph
Cargo Capacity	.83 m^3	Height: 457 mm (18") Depth: 686 mm (27") Width: 762 mm (30")	.83 m^3
Passenger Capacity	5	≥4	5
Braking 60 - 0	38 m- 43 m (123 -140 ft)	< 51.8 m (170 ft)	<51.8 M
Mass	1758 kg (3875 lb)	≤ 2268 kg* (5000 lb)	2224
Starting Time	≤ 2 s	≤ 15 s	≤ 15 s
Ground Clearance	198 mm (7.8 in)	≥178 mm (7 in)	≥178 mm (7 in)
Range	> 580 km (360 mi)	≥ 320 km (200 mi)	190 MILES



FC PHEV Architecture

Concept Selection:

Fuel Cell Plug-In Hybrid Electric Vehicle with Charge Depleting /Sustaining Battery mode. Vehicle plugs in to external source to store energy to a battery. During operation the battery is also charged by a Hydrogen Fuel Cell. Vehicle is powered by electric motor.



Component Packaging

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