



The Future of U. S. Electric Hybrids

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The Future of U.S. Electric Hybrids



- What is Driving the Publicity?
- What is the Real Objective?
- What are the Opportunities for Hybrids?
- What are the Advantages and Disadvantages of the Technology?
- What are the Alternatives?
- What does the Future Hold?

What are the Goals of Hybridization?



- Enhanced Vehicle Performance
- Reduced Fuel Consumption

What are the Environmental Benefits/Constraints



- Reducing consumption and CO₂ emissions
 - Hybrids are one alternative, but must be measured on a mission-specific basis
 - Fuel Consumption is regulated by the Motor Vehicle Cost and Information Act of 1972
 - The fleet average allows variation above and below the average

What are the Environmental Benefits/Constraints



Reducing criteria pollutants

- Hybrids will not reduce emissions of HC, CO and NO_x in the real world
- Criteria pollutants are regulated under the Clean Air Act
- Emissions are averaged over a cycle. If hybridization reduces emissions, e.g. during engine off, emissions may increase during other parts of the cycle, as long as the certification target is met
- All vehicles certified to a certain standard will meet that standard, without regard to engine size

What are the Environmental Benefits/Constraints



- Fuel Consumption and Criteria Pollutant Emissions are Independently Regulated under different Laws

Hybrid Advantages and Disadvantages



- Advantages
 - Opportunity to downsize the ICE engine
 - Potential to improve performance/AWD capability
 - Potential for all-electric low speed operation
 - Reduction in consumption & CO2 proportional to ICE downsize and/or all-electric range
 - Allows IC engine to operate in a narrower, more optimum speed/load range
- Disadvantages
 - System cost and weight
 - Vehicle utility constraints
 - Replacement battery pack costs
 - Fuel Economy Benefits are Mission-specific

What is “Mission-Specific” Fuel Economy?



- The fuel economy benefit of hybrids is most pronounced in cyclic driving, such as urban stop-and-go driving
- Hybrids do not offer cost effective fuel economy benefits in highway driving, or in conditions requiring high power (trailer towing)
- Diesels offer “Mission-neutral” fuel economy benefits, both in urban and cross country trailer-towing cycles.
- An optimum solution to the fuel economy question will likely include a variety of technologies.

What are the Alternatives



- Depending on stated goals and objectives, several alternatives to Hybrids are available
 - Diesels consume less fuel than hybrids
 - E-85 flexible-fuel vehicles have the potential to displace more inexpensive imported oil than hybrids
 - CNG vehicles produce less ozone-forming emissions than hybrids, and North American supplies of NG are plentiful

What does the Future Hold



- Fierce competition in the marketplace
- Continued desire for affordable vehicles that meet customer safety, utility, performance and fuel economy needs
- No single technology is likely to prevail in the near to mid-term
- A portfolio of advanced technologies offering environmental benefits that customers can choose from and are willing to pay for to meet individual needs is the best offense

DaimlerChrysler HEV's



Dodge Ram Contractor Special

- Integrated starter-generator hybrid powertrain
- Achieves up to 10% better fuel efficiency
- Converts to a clean electric generator when parked
- A complete work-site or household can be powered from the electric outlet box



DaimlerChrysler HEV's



Dodge Ram COMBATT HEV (Based on Dodge Ram HEV)

- Specially developed for military and non-military national defense programs
- On-board electric power generation
- State-of-the-art severe off-road suspension system
- 7% fuel economy improvement
- Meets DoD's "Single Battlefield Fuel" strategy

DaimlerChrysler Advanced Diesel



Jeep Liberty



DaimlerChrysler Flexible-Fuel Vehicle



Chrysler Voyager FFV



DaimlerChrysler Compressed Natural Gas



Dodge B2500 CNG Van

