



GENERAL MOTORS CORPORATION

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NEWS

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GENERAL MOTORS REVEALS FAMILY OF EARTH-FRIENDLY VEHICLES

CHICAGO — General Motors leaders have opened the doors of the company's research and development operations and displayed a family of advanced-technology cars, including an extended-range EV1 and an 80-mile-per-gallon, all-wheel-drive hybrid performance car.

"Our family of clean-car options is growing fast," said Jack Smith, General Motors chairman, chief executive officer and president. "This year, we're phasing in nickel-metal-hydrate batteries to our pioneering electric vehicles, the EV1 and S-10 Electric truck, and we plan to have a production-ready hybrid electric vehicle by 2001 and fuel-cell electric vehicle by 2004, or sooner."

General Motors' advanced technology vehicles include:

- EV1 with nickel-metal-hydrate (NiMH) batteries that increase range to 160 miles, setting the electric-vehicle benchmark for range and performance
- S-10 Electric truck with double-range NiMH batteries
- Series Hybrid using an electric motor charged by the world's most efficient gas-turbine generator system
- Parallel Hybrid, an environmentally conscious performance car, powered by an electric motor and direct injection turbo diesel
- Fuel Cell vehicle that runs on electrical energy created from a hydrogen-oxygen chemical reaction
- Compressed Natural Gas vehicle with a 1.0L, 3 cylinder, turbo-charged engine

"These cars are clean, safe and fun to drive," Smith said. "General Motors will continue to leverage its size, expertise and global resources to build on the valuable lessons we've learned from launching the first designed-from-the-ground-up electric vehicle, EV1."

The EV1's lightweight structure with the world's most advanced electric drive system and regenerative braking system laid the foundation for a portfolio of electric, hybrid and fuel-cell products.

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Smith said GM's marketing plans for the advanced-technology vehicles would depend on the global transportation infrastructure, affordability and customer acceptance of new technology. He underscored the imperative of balancing sound science with sound economics. "General Motors is committed to developing long-term sustainable market solutions that balance the interests of environmental stakeholders and corporate stockholders, and most importantly, customers."

In light of the recent Kyoto global climate agreement, Smith noted that General Motors' strategy of pursuing a family of options provides the most promise of increasing fuel economy and lowering emissions. However, Smith cautioned that mandating target emissions levels and dates is risky. "Innovation, not regulation, is the answer to reducing emissions. Regulation can divert an automaker's resources and attention from fully exploring the range of technologies, like those we are showing today."

Highlights of GM's family of advanced-technology vehicles:

Advanced Battery

- Ovonic nickel-metal-hydrate batteries to be phased into GM's current production EV1 and S-10 Electric truck
- Doubles the range of electric vehicles to 160 highway miles per charge (140 city)
- Better in colder climates
- Applies a more powerful version of batteries currently used in laptop computers, cellular phones and camcorders

Series Hybrid

- Electric motor drives front wheels
- Gas turbine generator system charges battery pack
- Regenerative braking also charges battery pack
- 60 mpg highway using reformulated gasoline
- Accelerates 0-60 in 9 seconds
- 40-mile zero-emission range; 350-mile hybrid range
- Turbine engine utilizes aerospace technology to provide increased efficiency and very low emissions

Parallel Hybrid

- World's first eco-friendly hybrid sports car
- 80 mpg highway using diesel fuel
- 550-mile range
- Accelerates 0-60 mph in 7 seconds (faster than BMW Z3)
- Electric motor drives front wheels
- Isuzu direct-injection turbo diesel drives rear wheels
- Opel automatically shifted manual transmission
- All-wheel drive with 4-wheel regenerative braking, providing improved traction
- "21st Century Hot Rod" -- clean and green, fast and fun

Fuel Cell Electric

- Hydrogen-fueled electric car: Hydrogen-oxygen chemical reaction creates electrical energy
- Near zero emissions of oxides of nitrogen and half the carbon dioxide (CO₂) of gasoline engines
- 80 mpg highway (gasoline equivalent)
- 300-mile range
- Accelerates 0-60 in 9 seconds
- Clean and efficient: strong potential to be the best long-term solution
- Applies same kind of propulsion system used in the Space Shuttle

Compressed Natural Gas

- 1.0L, 3 cylinder turbo-charged engine
- 60 mpg highway (gasoline equivalent)
- 400-mile range
- Continuously variable transmission for smoother ride
- Meets Ultra Low Emission Vehicle Standard (ULEV)
- Natural gas is a cleaner, plentiful, low-priced alternative to gasoline

“Combining advanced propulsion systems with EV1’s high-efficiency vehicle architecture allows us to investigate the full potential of these emerging technologies,” said Ken Baker, vice president, Global Research and Development Operations. “These new technologies not only must be environmentally friendly, but must deliver customer value. Clean cars such as the EV1 may be niche vehicles now, but in the future they’ll be produced for mass markets.”

Baker acknowledged, “We need to partner with the petroleum industry to make our family of advanced-technology vehicles even more viable. In particular, we need low sulfur, cleaner-burning gasoline and a new formulation of diesel fuels which reduce particulate and nitrous oxide emissions. Amoco has already agreed to work with us.”

In the spirit of the Partnership for a New Generation of Vehicles (PNGV), GM is pioneering these options to develop a new class of vehicle with up to 80 miles-per-gallon performance without sacrificing the affordability, utility, safety and comfort of today’s midsize cars. Collaborative work with the U.S. government contributed to the technologies unveiled today.

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**Photos, schematics and technical descriptions available at <http://media.gm.com>
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Video News Release and B-Roll available upon request