

Breakthrough Technologies on the Way

We will be introducing more than 15 new technologies a year from 2009 and continuing over the course of the NISSAN GT 2012 midterm business plan. These technologies will be in four major growth areas: safety, dynamic performance, life on board and the environment. Following are some of our current and upcoming advances.

Our safety theme is “accident free.” The ultimate aim here is to engineer vehicles that are accident-free. According to our “Safety Shield” safety technology concept, this means a vehicle that helps protect people. More specifically, the vehicle activates multiple barriers to help protect people from potential risks coming from every direction.

An inflection point exists between the rate of fatal/serious injury and vehicle speed, and our approach is to help decrease fatal and serious injuries to as close to zero as possible. This approach has two aspects. One is to reduce speed to a minimal level to help avoid collisions and minimize risks. The second is to enhance protection for the occupants, as well as pedestrians, cyclists and others outside the vehicle when a crash is unavoidable.

We released several such innovations last year, including major upgrades of our Distance Control Assist, Lane Departure Prevention, and Around View Monitor technologies. We are extending the innovations to monitor the cars behind and next to you as well—incorporating “Back-up Collision Prevention” and “Side Collision Prevention”—to provide 360-degree coverage. Our new Smart Auto Headlight and GPS Mobile ITS for Pedestrian Safety will help reduce the risk of crashes, and the Intelligent Seatbelt will help improve occupant restraint during abrupt maneuvers and skid situations.

Nissan cars already are renowned in the realm of dynamic performance for their acceleration, deceleration, braking and handling, such as the new GT-R we launched last year. The evolution to realize innovative dynamic control for an exhilarating driving experience is ongoing. A combination of IT/ITS and vehicle dynamics control, for example, will allow us to achieve highly balanced riding comfort and handling.

“Life on board” refers to everything that occurs between the time you enter a vehicle and when you get out. Our goals are to make vehicles easier to own and operate, to be more pleasant places to inhabit, and to make data from the outside world more accessible. One example is the Scratch Shield, an innovation with both aesthetic and practical appeal. The shield actually repairs fine scratches, restoring surfaces to virtually their original state in anywhere from a day to a week. We are expanding the use of the Scratch Shield globally.

As stated in our NISSAN GT 2012 commitment, our goal is to become the industry leader in zero-emission vehicles. Therefore, we’re excited about and focused on the environment. Our environmental technology development has three aspects: promote the use of clean energies, create innovative energy-storage solutions, and enhance vehicle energy efficiency.

Electric vehicles and fuel cell vehicles will contribute to the use of clean energies. Our newly developed laminated lithium-ion (Li-ion) battery will enable us to come up with better energy-storage technologies. Nissan’s original hybrid vehicle, Eco-pedal eco-driving support system and advanced engine technologies, including homogeneous-charge compression ignition (HCCI), will improve vehicle energy efficiency.

EVs will be our core technology and environmental contribution to the world. We will introduce EVs in the United States and Japan in 2010 and to the mass market two years later.

In addition to EVs, there are many technological advances for internal combustion engines, hybrids, clean diesels and fuel-cell vehicles.

Our original hybrid vehicle, which will debut in North America and Japan in 2010, is another huge advance. While typical hybrids produce smooth, continuous power, our simpler system provides Nissan’s dynamic driving performance and conserves fuel.

Our clean diesels will offer the maximum power response for a two-liter diesel engine, produce very little noise, and meet the tough Euro4 standard on exhaust emissions. We developed a clean diesel for the X-TRAIL in Japan to meet the tough Post New



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Long-term emission regulations, which set one of the most stringent emissions requirement to date here.

In 2003, Nissan leased examples of fuel cell vehicles (FCVs) to government authorities in Japan. The latest prototype is enjoying a favorable reception at demonstrations in Europe. Renault's prototype features our FCV powertrain including fuel-cell stack. A new-generation fuel cell stack has been developed with power density two times higher than the current prototype vehicles.

A key EV component is its Li-ion battery, a technology we have been developing since 1992. We started a joint venture with NEC called Automotive Energy Supply Corporation (AES) to develop and produce batteries for a wide range of automotive applications. EV batteries capable of running a vehicle over 100 kilometers per charge are still expensive and huge, weighing over 200 kilos. Our goal is a light, high-capacity battery that can be mass-produced close to the assembly line and target market so that economies of scale make them affordable for everybody.

One key attribute of the battery is its reliability. Incidents involving computer and cellular phone batteries have some people thinking lithium-ion batteries are dangerous. But the structure and materials of our batteries are quite different from those. We are confident that even under severe conditions these power cells are stable.

To devise the next-generation battery, we are investigating new chemicals and new materials. Smaller, lighter batteries that can be installed

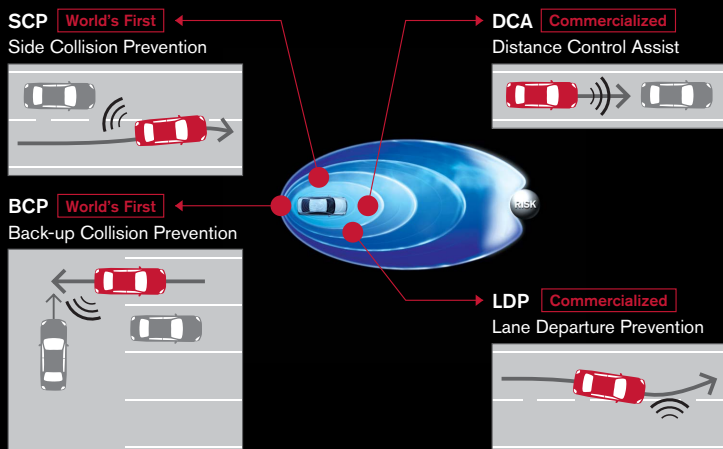
anywhere obviously would extend driving range and make modular construction of vehicles more feasible.

Three key factors will ultimately determine our EV success and zero-emission leadership status. Continuously upgrading battery power, capacity and durability will contribute to the evolution of two of those factors—driving range and vehicle price. If we rated battery capacity around the year 2000 as one, we are now around double that. This capacity will allow our EVs to travel much further than current EVs. By simply maintaining that range, we can reduce prices and make our cars available to more customers.

The third factor is "EV appeal." EVs offer a smooth, extremely quiet ride and powerful acceleration. Using in-wheel motors and a by-wire system would also allow unprecedented vehicle control and far greater mobility than gasoline and diesel engines with conventional transmissions.

Even though the technological competition is intensifying, we already are reaching levels of performance that our competitors cannot match. Meanwhile, some say that if the batteries reach ten times the capacity of the 2000 version, EVs will become a true zero-emissions mobility option. We are working to make that a practical reality, as rapidly as possible.

ALL-AROUND COLLISION-FREE PROTOTYPE



NEWLY-DEVELOPED LAMINATED LI-ION BATTERY

