Special Feature 2012

Special Feature 2012

Striving to become No.1 in fuel economy

- Honda will create the ultimate internal combustion engine.
- EARTH DREAMS TECHNOLOGY, a series of innovative technologies
- Pursuing fuel economy, joy, and utility

Special Feature 2012

Change lives on a worldwide scale

Playing a useful role in people's lives,putting a smile on the customer's face

- Creating a new residential paradigm
- Supplying essential products

Special Feature 2012

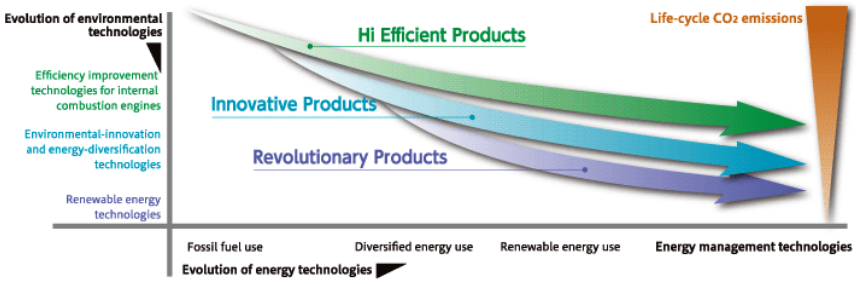
Striving to become No.1 in fuel economy

Honda adopted an environmental vision based on “the Joy and Freedom of Mobility” and “a Sustainable Society Where People Can Enjoy Life” in 2011. To implement that vision, we are pursuing a policy of innovation and integration with regard to environmental and energy technologies. By working to improve the efficiency of internal comobustion engines, address innovative environmental technologies and the diversification of energy, accommodate renewable energy sources such as hydrogen and solar power, and integrate these initiatives with energy technologies, we are striving to eliminate greenhouse gases emitted from mobility-related activities and throughout our lives.

During fiscal 2012, Honda's business activities gave rise to a multitude of products that draw on innovative, advanced technologies from the standpoint of improving the efficiency of internal comobustion engines.

Today, with large numbers of people still using fossil fuels, Honda is endeavoring to make low-carbon lifestyles possible in communities worldwide by boosting the fuel economy of all its products automobiles, motorcycles, and power products.

Product-based scenarios for addressing climate change and energy issues



New, next-generation technologies as only Honda can develop

EARTH DREAMS TECHNOLOGY is the name we give to a series of new, next-generation automobile technologies that deliver an advanced mix of driving performance and fuel economy while pursuing Honda's unique brand of fun. Their exceptional environmental performance derives from the improved efficiency of internal combustion engines and transmissions as well as the evolution of motors and other electrically powered technologies. In addition to these innovations and advanced technologies, we have announced a variety of new technologies and products in the motorcycle segment, including a number of global engines and our New Mid series. Going forward, we will continue to strive to realize a sustainable society through Honda's uniquely sophisticated and creative approach, which is based on fun, the environment, and safety consciousness.

Honda will create the ultimate internal combustion engine.

EARTH DREAMS TECHNOLOGY

EARTH DREAMS TECHNOLOGY, a series of innovative technologies

Pursuing fuel economy, joy, and utility

Special Feature 2012 Striving to become No. 1 in fuel economy

Honda will create the ultimate internal combustion engine

President, Honda R&D Co., Ltd. Yoshiharu Yamamoto

No.1 in fuel economy in every category

President, Honda R&D Co., Ltd.
Yoshiharu Yamamoto

Our world, where the trend was toward high performance, high output, and larger, more luxurious products, underwent a sea change following the Lehman Shock. Additionally, the market in emerging nations has expanded greatly, to the point that it is no exaggeration to describe that segment as a major focus of our business. Faced with these changes, Honda resolved to steer its operations toward creating inexpensive products that combine superior performance with fuel economy, and this policy bore fruit during 2011. By rapidly steering for this new course, we accelerated our research operations and gained the ability to move from launching a project to bringing that product to market faster than our competitors. Our only misstep was a slight delay in reading the market and taking action. The EARTH DREAMS TECHNOLOGY initiative has allowed us not only to erase that delay, but also to prepare to overtake our competitors' efforts. Our goal is to bring to market a series of products within the next three years and to become No. 1 in fuel economy in every category. But this is only a point on our journey. We've already set even higher objectives and started to develop the next generation of technologies.

Toward differentiation that exceeds expectations

The vehicle equipped with the electric SH-AWD new hybrid system in EARTH DREAMS TECHNOLOGY series

I believe that internal combustion technology, including both gasoline- and diesel-powered variants, has another 20 or 30 years to play the leading role. There is still room left for internal comobustion engines to evolve, and based on recent progress, I think that we'll see thermal efficiency rise to 50 percent. If I were to describe my greatest dream as an engineer, it would be to achieve 50 kilometers per liter with a simple gasoline engine by taking advantage of across-the-board technological progress in the form of the evolution of transmission and chassis technologies. In my view, Honda's destiny is to create the ultimate internal combustion engine. Humankind may transition to EVs and other means of mobility in the future, but first Honda must create an engine that stands at the zenith of the internal combustion era! Honda is unique in embracing such an approach.

For Honda to fully realize its uniqueness, we must focus not on mere differences, but on differentiation. Just as our founder spoke about the importance of Honda's being in its own element and declared that engineering without personality doesn't have much value, our corporate culture today burns with passion to become No. 1 in short, to create and supply products that are far and away the best of their breed. I'm not talking about achieving 30.1

kilometers per liter when other manufacturers reach 30. Honda strives to employ completely different approaches and new ideas and in the process, to differentiate itself in order to reach fuel economy numbers like 40 or 50.

For example, the New Mid series is an excellent example of this drive toward excellence. In our time, creating high-rpm engines embodied the evolution of technology. But New Mid engines only reach half of those levels. This is a proposal of new value, a challenge that completely changes the paradigm. These motorcycles not only deliver dramatically improved fuel economy and use a new technology that competitors can't match in the form of the dual-clutch transmission*, but also let the rider have great fun. One journalist who test-drove a New Mid motorcycle on a test course remarked that he wasn't expecting it to be so fun.

We will continue to simultaneously develop products with powerful engines in the automobile segment as well. Starting with the super-sports category based on our NSX Concept, we will propose new value with products that mix environmental performance with fun by embodying EARTH DREAMS TECHNOLOGY. Technology is also evolving in the power products segment. For example, our hybrid snow blower is extremely easy to use. We're also proposing a new vision for society with products such as smart home systems that comprise a creative energy business.

We've developed a solid technological basis for motorcycles, automobiles, and power products. We will make 2012 a year in which we reliably and quickly deliver products to customers worldwide. In our 100th year since the company's founding, our goal is to be No. 1 by continuing to provide the products desired by customers worldwide products characterized by exceptional performance and inexpensive prices. I plan to respond to the diverse needs of customers in different regions worldwide while each and every employee in the field thinks continuously about what customers want and how we can change our products and operations to accommodate those desires.

*A geared automatic transmission, developed by Honda as the world's first such technology for motorcycles.

EARTH DREAMS TECHNOLOGY, a series of innovative technologies

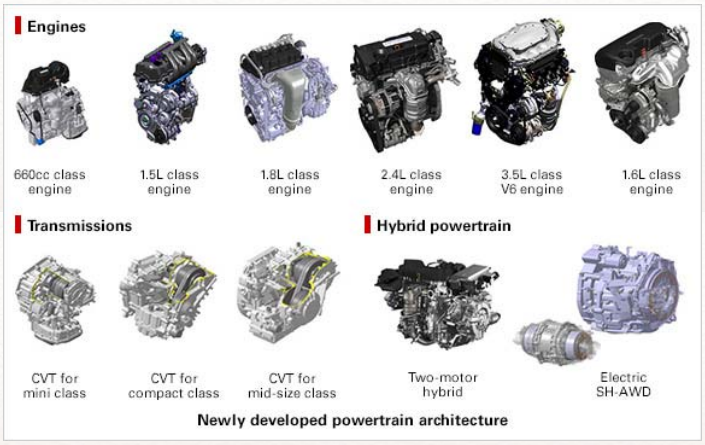
In November 2011, Honda announced EARTH DREAMS TECHNOLOGY, a series of technologies that fulfill both our need to protect the Earth's environment and our dream of enjoying driving. This series of new, next-generation technologies is designed to deliver an advanced mix of driving performance and fuel economy while pursuing Honda's unique brand of driving pleasure. Their exceptional environmental performance derives from the improved efficiency of internal combustion engines and transmissions as well as the evolution of motors and other electrically powered technologies.

For our series of newly developed gasoline engines, we will create the world's top-performing gasoline engine in terms of output and fuel economy; for our diesel engine series, the world's lightest small diesel engine; for our transmission series, an exhilarating and sporty CVT; for our hybrid series, the world's most efficient two-motor series hybrid and plug-in hybrids; and for our Electric SH-AWD new hybrid system, innovative technology that allows the vehicle to handle as if it were on rails. Going forward, we will roll out EARTH DREAMS TECHNOLOGY in new products in a range of categories, starting with the N BOX minivan. In addition to striving to become No. 1 in fuel economy in every category within the next three years, we are aiming to slash CO_2 emissions from products sold worldwide by 30 percent compared to 2000 levels by 2020.

Six technologies for becoming No. 1 in fuel economy

1. A gasoline engine that delivers world-class driving performance and fuel economy
2. A small diesel engine that delivers the world's lightest weight* as well as class-leading* acceleration and fuel economy
3. A CVT that provides an advanced mix of driving pleasure and fuel economy
4. A two-motor hybrid system that delivers the world's highest level of efficiency*
5. The Electric SH-AWD high-efficiency, high-output hybrid system, which combines driving performance and fuel economy
6. A compact, high-efficiency electric power train for EVs

*According to Honda research (as of November 30, 2011)



Newly developed powertrain architecture

N BOX:The present tense of fuel economy and the M/M concept

N BOX crystallizes technology used in the EARTH DREAMS TECHNOLOGY gasoline engine series to combine fuel economy and driving performance. Through innovations in the evolution and framework of Honda's VTEC technology, we created a more powerful engine with evolved environmental performance. The vehicle achieves top-level power in the mini-vehicle category as well as top-level environmental performance.

The comfort of N BOX was made possible by its innovative platform.

Engineers' third challenge, in addition to delivering both fuel economy and driving performance, was comfort. This is the current state of the M/M concept (man maximum, mechanism minimum), which turns the idea of people being at the center of the design into a system of thought. Physical comfort in terms of space leads to emotional comfort. It is the N BOX's innovative platform, characterized by a minimal engine space and a center tank layout, that creates this comfort.

Contributing to reduced weight and improved fuel economy through design and production innovations

The N BOX's body and chassis reflect the aggressive pursuit of light weight and high efficiency. We reviewed the traditional manufacturing process of building the body by combining the roof and side panels. Instead, we decided to build the framework first by joining only the inner frame of the roof and side panels to the floor and then welding the outer panels on later. In this method, we first assemble a strong skeleton and then cover it with panels, allowing the number of bolts and the amount of reinforcing material to be reduced compared to previous methods. A number of creative techniques allow us to reduce the thickness of steel sheets without sacrificing their strength. The N BOX, which uses these technologies, achieves a 10 percent reduction in body weight. We have pursued further improvements in fuel economy by using lighter-weight components and tires with low rolling resistance.

The N BOX body is 10 percent lighter.

The NSX Concept, which combines the joy of driving with environmental conservation

The NSX Concept
on display at Welcome Plaza Aoyama

The NSX Concept, which highlights Honda's approach to next-generation super-sports car design, was announced at the North American International Auto Show in January 2012. The vehicle features the Sport Hybrid SH-AWD hybrid powertrain, which incorporates the latest environmental technologies while carrying on the fun-to-drive spirit that animated the first NSX. This hybrid system combines a hybrid powertrain with two built-in drive motors designed to improve handling performance. A two-day exhibit of the concept for the general public held in February 2012 at Honda's Aoyama Headquarters drew some 13,000 visitors, highlighting high expectations for the next-generation NSX.

New CVTs with dramatically improved response and fuel economy

Honda's newly developed CVT for midsize vehicles

Honda has introduced three new CVT models that use advanced technology to deliver driving pleasure and excellent fuel economy for mini, compact, and mid-size vehicle classes, allowing the design to be used with a variety of engines. The new CVTs feature G-Design Shift, which provides a new level of cooperative control over shifting, throttle, and hydraulic control. By responding even more quickly to driver inputs and delivering a powerful, long-lasting feeling of acceleration, this control system provides an exhilarating and sporty driving feel.

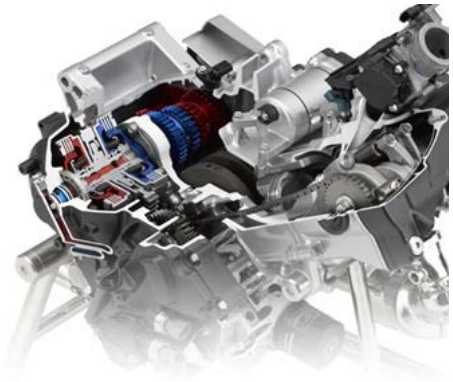
In addition to shortening the overall length of the system for the mini-vehicle class by taking a creative approach to control devices and shaft placement, we reduced the total part count to achieve a lightweight, compact design, including by simplifying the design of the transmission case. For the compact and mid-size vehicle classes, we augmented changes designed to reduce weight and size by increasing gear ratios and dramatically boosting transmission efficiency, delivering fuel economy improvements of about 5 percent compared to previous CVT designs* and about 10 percent compared to conventional 5-speed automatic transmissions in the same class*.

*Comparison by Honda.

Special Feature 2012 Striving to become No. 1 in fuel economy

Pursuing fuel economy, joy, and utility

In addition to automobiles with innovative EARTH DREAMS TECHNOLOGY, Honda will create the ultimate motorcycle of the internal combustion era. This commitment to excellence can be seen in our development of a new engine for 125 cc scooters, which are used by a large number of customers worldwide, and in the New Mid series, which overturned existing stereotypes when it was announced at the Milan Motorcycle Show in Italy. We have also developed a low-cost, compact motorcycle with a comprehensive range of improvements including ease of use, fuel economy, driving performance, and durability for Africa, where the market is poised to expand in the future. Honda is striving to become No. 1 by providing high-performance, inexpensive products that customers worldwide want.



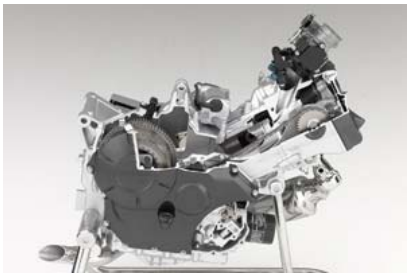
A motorcycle engine with dramatically improved fuel economy

Honda's approach is to contribute to lower CO_2 emissions on the global scale by further increasing the fuel economy of the engines used in its global models. We announced a new engine for the 125 cc scooters that are loved by a large number of customers worldwide in September 2011. This next-generation engine delivers improved durability, quietness, and fuel economy. The Thai-produced Click125i began using the new engine in January 2012, and going forward we will bring it to various global scooter models.

We also announced three new models for middle-class consumers in the European market, which is characterized by a mature motorcycle culture, in November 2011. These models feature a newly developed midsize 700 cc engine and transmission. In addition to delivering robust torque performance during low- and medium-rpm operation, which characterizes most city riding and touring, the new engine provides best-in-class fuel economy of 27 kilometers per liter* or better, representing an improvement of 40 percent or more compared to sports models in the same class (according to Honda estimates).

*WMTC mode (European model, Honda estimate).

New 125 cc global engine, esp



New 700 cc engine

A motorcycle with superior environmental performance for everyday use

The New Mid Concept refers to the NC700X and two other models announced by Honda in Japan in February 2012. These midsize motorcycles offer a pleasant, distinctive riding experience along with exceptional fuel economy and ease of use in normal riding, including city riding and touring. As products, they give shape to Honda's philosophy of providing this type of motorcycle at an affordable price.

Perspective drawing of the NC700X

The engine features a broad range of innovations such as an ideal combustion shape and low-friction technologies in an effort to augment robust output performance during low- and medium-rpm operation with improved fuel economy borne of the pursuit of combustion efficiency. Thanks to these enhancements, which allow the engine to achieve 41.0 kilometers per liter (test figures recorded while driving at 60 kilometers per hour), we were able to shrink the fuel tank and move it underneath the seat, opening up space where the fuel tank used to be. By inclining the engine forward so that this space could be most effectively utilized, we created a luggage space capable of accommodating a full-face helmet. In applying fuel economy improvements to the shape of the motorcycle itself in this way, we are able to provide customers with a unique Honda product that combines not only power and fuel economy, but also a superior level of utility.

Bringing inexpensive, high-quality transportation to Africa

It is said that there are about 4.5 million drivers of motorcycle taxis known as *okada* in the African nation of Nigeria. *okada*, which are greatly appreciated by the region's residents, are used not only for commuting to work and school, but also for transporting merchandise. Honda's Ace CB125 was designed to offer a superior level of utility and ease of use when utilized as an *okada*. Designed to be a low-cost, compact motorcycle for emerging nations, this 125 cc model features exceptional ease of use, fuel economy, driving performance, and durability even as it leverages Honda's global network to further boost cost competiveness. Priced at about 100,000 naira (about ¥50,000*) to make it accessible to customers in emerging nations, the Ace, which was launched in September, has earned high praise for its quality, performance, suitability for use as an *okada*, and powerful engine.

* Calculated at 1 naira = about ¥0.5.

A billboard on a major road advertises the Ace CB125.

The Ace CB125 is extremely popular with *okada* riders.