GENERAL MOTORS

greener vehicles
we're building fuel-efficient vehicles that fit our customers' needs and lifestyles

Strategy

- We are transforming transportation using a long-term, customer-centric approach.
- We are restructuring vehicles to maximize efficiencies, reimagining manufacturing to lessen environmental impact, and collaborating with unlikely partners, from NGOs to competitors, to advance the industry.

Innovation

- We lead all companies in U.S. clean-energy patents granted since 2002, according to the Clean Energy Patent Growth Index.
- We've received more than 700 patents in fuel cell technologies since 2002, more than any other company, according to the Clean Energy Patent Growth Index.
- The Patent Board ranked us No. 1 innovator in its quarterly automotive and transportation industry scorecard 13 consecutive times from 2012 to 2014. GM has been in the top five since Patent Board began publishing the scorecard in January of 2007.

Product Commitments

- We developed commitments to meet customer needs for efficient vehicles and reduce our products' environmental impact:
  - Put 500,000 vehicles on the road in the U.S. with some form of electrification by 2017. As of 2014, we have 180,834.
  - Double the models that achieve an EPA-estimated 40-mpg highway or better by 2017. As of 2014, we have six.
  - Reduce average carbon emissions of U.S. fleet by 15% by 2016, Opel/Vauxhall fleet in Europe by 27% by 2020; and China fleet 28% by 2020.

Efficient Fundamentals

- Our efficient fundamentals strategy encompasses aerodynamics, lightweight materials, advanced materials and engine technology.
- We're focused on reducing vehicle weight to help meet global CO_2 standards and offer consumer benefits; various grades of steel, aluminum and composites are used to help make GM vehicles stronger, safer, more fuel efficient and fun to drive.
- Our R&D team invented industry-first welding technologies enabling us to weld aluminum to steel and aluminum to aluminum enabling vehicles to be lighter and more fuel efficient while at the same time more structurally robust.
- Efficiency improvements to our internal combustion engines include:
  - Active fuel management, enabling a V8 engine to operate on half the engine's cylinders when full power is not needed. Fuel economy is improved about 12%.
  - Direct injection allowing for more precise fuel delivery and better control of the combustion process, improving fuel economy by 3% and reducing cold start emissions about 25%. We were the first domestic automaker to introduce the technology and 70% of our vehicles have it.
  - Variable valve timing, featured on virtually all engines, alters the timing of intake and exhaust valves, allowing the engine to maximize horsepower and torque while helping reduce emissions. Fuel economy is improved 2%.
- For the 2015 model year, we have 25 models achieving at least an EPA-estimated 30 mpg hwy; six of which get at least 40 mpg, like the segment-leading Chevrolet Cruze Eco.
- Since the 1970s, we've improved fuel efficiency 180% for cars and 93% for trucks.

Electric Vehicles with Extended Range

- The Chevrolet Volt is the world's first mass-produced electric vehicle with extended range. The Cadillac ELR luxury coupe features the first application of extended range EV technology by a full line luxury brand, eliminating range anxiety.
- For the first 53 miles, the 2016 Volt can drive gas and tailpipe-emissions free using a full charge. After the battery is depleted, the engine acts as a generator to power the electric motors, which drive the wheels. Total driving range is over 420 miles.
- Volt owners collectively have driven more than 700 million all-electric miles. The average Volt owner travels more than 65% of the time in pure electric mode and goes an average of 900 miles between fill-ups. This has saved more than 25 million gallons of gasoline.

All-Electric Vehicles

- The Chevrolet Spark EV is the industry benchmark in retail electric vehicle efficiency with an EPA-estimated combined city/highway 119 MPGe. It has a combined city/highway EPA estimated range of 82 miles when fully charged.
- Spark EV is the first vehicle in the market to offer an SAE combo charger option for DC Fast Charging, enabling it to recharge up to 80% of its capacity in about 20 minutes.
- Chevrolet will build a next-generation pure electric vehicle based on the Bolt EV concept.
  - We developed the concept as a long-range pure electric for all 50 states and designed to offer more than a GM-estimated 200 miles of range at a target price of around $30,000.

Hybrids

- Chevrolet will build a new hybrid version of the Malibu for the 2016 model year, offering a GM-estimated 48 mpg city, 45 mpg highway and 47 mpg combined, unsurpassed in the segment. The lithium-ion based chemistry of our 80-cell battery pack can power the vehicle up to 55 miles per hour on electricity alone.
- Cadillac expects the fuel economy of its 2016 CT6 plug-in hybrid – available in China – to be more than double that of the car's conventional engine offerings, as measured by miles per gallon equivalent. Its 18.4 kWh lithium-ion battery pack has the largest storage capacity rating for any PHEV in the luxury sedan segment.

Hydrogen Fuel Cell Vehicles

- Hydrogen fuel cells – using no gas nor releasing any emissions other than water vapor – are part of our advanced propulsion portfolio.
- In collaboration with Honda, we are developing next-gen hydrogen fuel cell systems and storage technologies in the 2020 timeframe.
- We will pursue non-automotive fuel cell applications for aerospace and military industries.

Batteries & Electric Motors

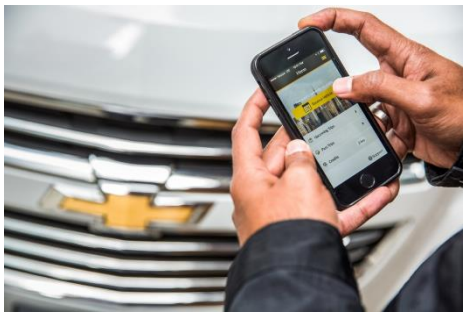
- We are a leader in advanced battery technology and consider it a competitive advantage. We have labs in U.S., China and Germany.
- We operate the largest battery systems lab of any automaker in North America and first high-volume automotive lithium-ion battery manufacturing site in the United States.
- We are the first major U.S. automaker to design and build electric motors and drive units for plug-in electric and hybrid vehicles.

Diesel, CNG & LPG

- We're leveraging our diesel engine expertise in markets around the world; in the U.S., there are several models available such as the Chevrolet Cruze Clean Turbo Diesel, which delivers an industry best EPA-estimated 46 MPG on the highway, and the Chevrolet Colorado and GMC Canyon. All of our diesel models in the U.S. are capable of running on B20.
- We offer several models capable of running on CNG and LPG. They include full-size vehicles, pickups, and sedans, primarily targeted to fleet/commercial customers; they are also available to retail customers in certain markets.

Personal Mobility & Car/Ride Sharing Services

- We are using our information, connectivity and transportation expertise to engineer mobility services that advance our sustainability.
- We are committed to providing seamless access to mobility, and in many markets, re-imagining how vehicles fit within an environment to efficiently move people from point A to B. Some of our offerings include:
    - Let's Drive NYC car-sharing for residents of a Manhattan apartment building
    - Investments in Germany of ridesharing service flinc and Opel's new car-sharing community CarUnity
    - Zagster bike sharing at our Technical Center
    - Partnership with Jiao Tong University in China to integrate Chevrolet EN-V 2.0 vehicles into multi-modal transportation system



- We will announce another car-sharing program first quarter next year in another U.S. city; the project will expand our participation in alternate transportation models, which we anticipate will generate additional revenue and profits.
- We partnered with Google last year to test a commuter ride-sharing service using Chevrolet Spark EVs in an app-driven system to match drivers and riders based on commuting patterns and schedules.
- We designed an electric bike concept to demonstrate our evolving view of mobility and to help people stay mobile a difficult-to-navigate urban landscape.

EN-V (Electric Networked Vehicle)

- The Chevrolet EN-V is an electric urban mobility concept powered by lithium-ion batteries.
- We built EN-V to represent our vision to meet growing demand for safe, connected, zero-emissions transportation.

Autonomous Vehicles

- Our global Tech Center is a rapid-development lab providing data and lessons to accelerate our mobility strategy. Later next year, we'll add a fleet of autonomous Volts that employees can reserve through an app; the car will drive to the desired location and park it.
- We will be the first to introduce semi-autonomous driving technology to the market in the 2017 Cadillac CT6.