



**Fleet and Commercial**

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Commercial and Government**

# *Advanced Propulsion Technology Strategy*



ELECTRIC

*Chevrolet Volt*





## 2011 Chevrolet Volt

- Volt is the world's first mass-produced electric vehicle with extended-range, providing a total range of up to 379 miles
  - Revolutionary Voltec propulsion system delivers between 25 and 50 miles of electric driving
  - Depends on terrain, driving technique and temperature





## 2011 Chevrolet Volt

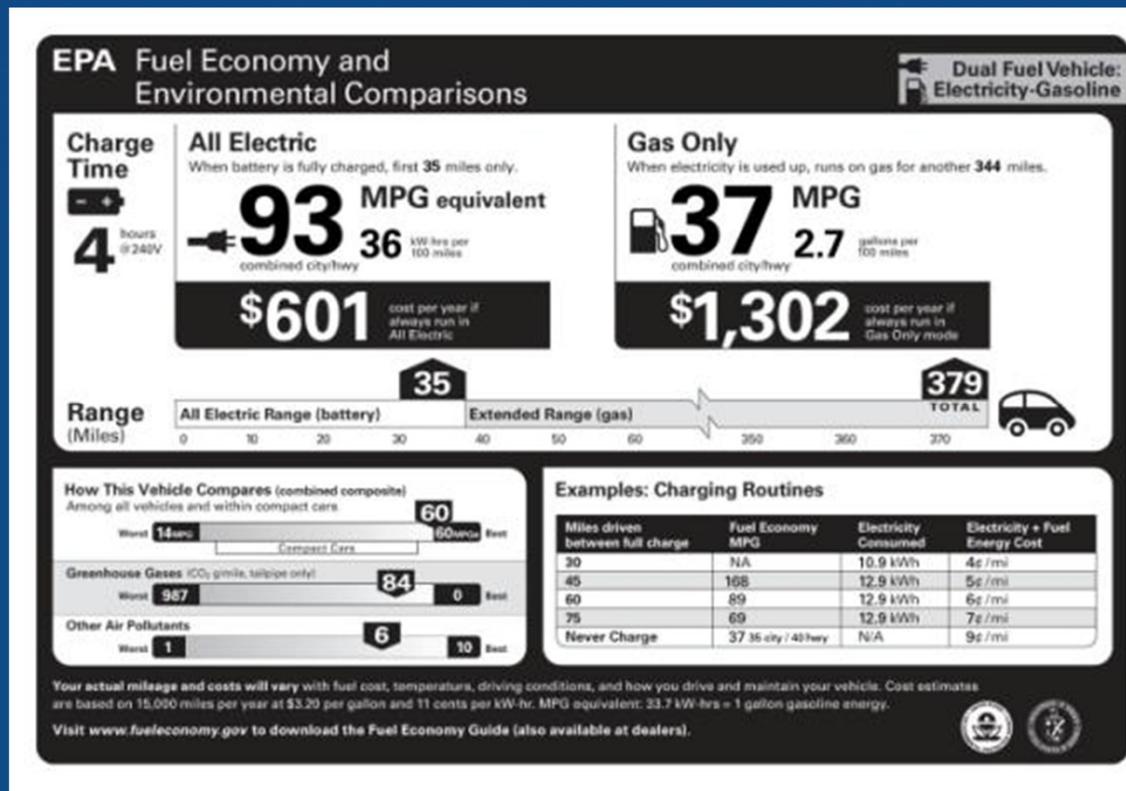
- When battery power is depleted, the Volt seamlessly transitions to extended range mode
  - The technically advanced 1.4L gasoline-powered engine extends the range up to an additional 344 miles
- The Volt always makes use of electric power within the drive unit





# Volt Fuel Economy Label

- Because the Volt and its technology are like no other car before it, the U.S. EPA and General Motors collaborated to design a new label
- New label helps customers understand what they can expect when driving a Volt





## Volt Label – MPGe Rating

- The MPG equivalent is determined by measuring electricity use and converting it based on the energy content in a gallon of gasoline (assumes 33.7 kWh = 1 gallon of gasoline)
- Volt has a 93 MPGe rating. Volt owners who use electricity more efficiently will have a higher MPGe value





## Volt Label – Range Rating

- According to the EPA, the Volt will achieve 35 miles of all-electric driving range (this depends on temperature, terrain and driving technique)
- The Volt will go another 344 miles on gasoline, for a total range of approximately 379 miles





# Volt Label – Gas-only MPG Rating

- The Volt will achieve 37 mpg if the battery is never charged
- This is respectable fuel economy, considering the size and weight of the battery





# Volt Label – Comparison Chart

- This chart shows how the Volt compares with traditional gasoline-powered vehicles in terms of overall efficiency, along with tailpipe emission performance
- The composite fuel economy number of 60 is based on a blend of electric and range-extended driving





# Volt Label – Charging Routines

- This chart allows drivers to get a quick estimate of what mileage they will achieve based on how far they expect to drive between charges
- Example: If they travel 30 miles between charges each day, they will likely never consume any fuel, but they will use 10.9 kWh of electricity at an estimated 4 cents per mile





# Volt Fuel Economy Label

## EPA Fuel Economy and Environmental Comparisons

 **Dual Fuel Vehicle:  
Electricity-Gasoline**

### Charge Time



**4** hours  
@240V

### All Electric

When battery is fully charged, first **35** miles only.

**93** MPG equivalent  
36 kW-hrs per 100 miles  
combined city/hwy

**\$601** cost per year if always run in All Electric

### Gas Only

When electricity is used up, runs on gas for another **344** miles.

**37** MPG  
2.7 gallons per 100 miles  
combined city/hwy

**\$1,302** cost per year if always run in Gas Only mode

### Range (Miles)

All Electric Range (battery)

**35**

Extended Range (gas)

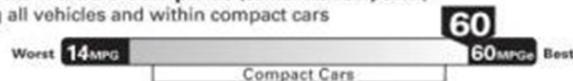
**379**

TOTAL

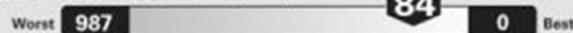


### How This Vehicle Compares (combined composite)

Among all vehicles and within compact cars



### Greenhouse Gases (CO<sub>2</sub> g/mile, tailpipe only)



### Other Air Pollutants



### Examples: Charging Routines

Miles driven between full charge	Fuel Economy MPG	Electricity Consumed	Electricity + Fuel Energy Cost
30	NA	10.9 kWh	4¢ / mi
45	168	12.9 kWh	5¢ / mi
60	89	12.9 kWh	6¢ / mi
75	69	12.9 kWh	7¢ / mi
Never Charge	37 35 city / 40 hwy	N/A	9¢ / mi

Your actual mileage and costs will vary with fuel cost, temperature, driving conditions, and how you drive and maintain your vehicle. Cost estimates are based on 15,000 miles per year at \$3.20 per gallon and 11 cents per kW-hr. MPG equivalent: 33.7 kW-hrs = 1 gallon gasoline energy.

Visit [www.fueleconomy.gov](http://www.fueleconomy.gov) to download the Fuel Economy Guide (also available at dealers).





## 2011 Chevrolet Volt

- The Volt competitive advantage...it can be the only car you need to own
  - It can be driven across town or across the country in all climates, without range anxiety





## *Voltec Propulsion System*

- The Voltec Propulsion system consists of:
  - 16-kWh lithium-ion battery pack
  - 111-kW (149-hp) high-torque electric drive unit
  - 1.4L 63-kW (84-hp) gasoline-powered engine





## *Chevrolet Volt Performance*

- The Volt proves electric driving can be spirited
  - Top Speed – 100 mph
  - Torque – 273 lb.-ft.
  - 0-60 mph in less than 9.0 seconds
  - Quarter mile in less than 17 seconds





## *Charging the Chevrolet Volt*

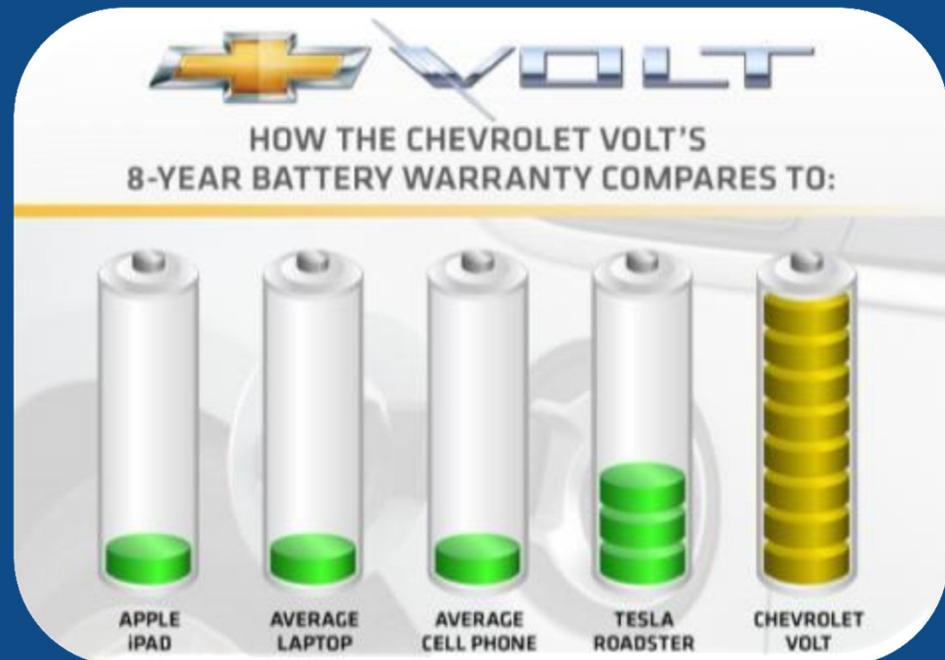
- The Volt plugs into a standard 120v household outlet or a 240v outlet for charging
  - From fully depleted, less than 4 hours of charging with 240v; about 10-12 hours using 120v
  - Cost to recharge from empty to full is about \$1.50





## Volt Battery Warranty

- Volt battery will have eight-year/100,000-mile warranty on its advanced, lithium-ion battery
  - Warranty is transferable at no cost to other vehicle owners
  - Warranty is comparable to other vehicles in segment, and better than many other battery operated devices





## 2011 Chevrolet Volt Interior

- Volt offers the space, comfort, convenience and safety features that customers expect in a premium five-door sedan





## 2011 Chevrolet Volt Features

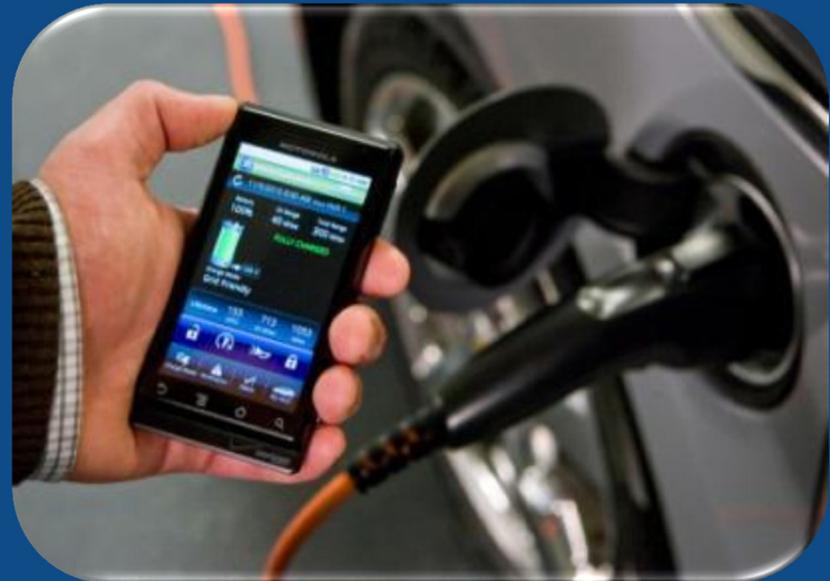
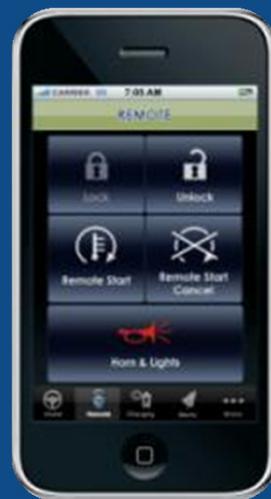
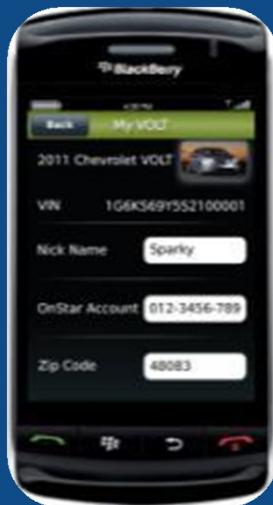
- Two seven-inch LCD screens that display key information and house touch screen control for:
  - Infotainment
  - Climate-control
  - Driver efficiency
  - Other key vehicle functions such as charging





## *Volt Connects with Owners 24/7*

- Owners can engage with their Volt:
  - With computer using MyVolt.com owner web site
  - With OnStar Mylink Mobile App for Chevrolet
    - Start charging
    - Pre-condition the cabin
    - Lock and unlock doors
    - Program the vehicle charging schedule
    - Check charging status





## 2011 Chevrolet Volt Price

- The MSRP for the 2011 Volt starts at \$41,000
  - There is a Federal tax credit, ranging from \$0-\$7,500
  - With the full tax credit, the Volt's net price could be \$33,500, including a destination charge of \$720



Note: See [www.irs.gov/irs](http://www.irs.gov/irs) for details



## 2011 Volt – Born and Built in U.S.

- GM invested more than \$700 million in eight Michigan plants for Volt production
- Key facilities
  - Detroit-Hamtramck Assembly – Investment of \$336 million
  - Brownstown Battery Assembly – Investment of \$43 million
  - GM Global Battery System Lab – Investment of \$33 million





## *2011 Chevrolet Volt – On Time*

- Volts are currently on sale in California, Washington, D.C., New York City and Austin, Texas
- In Q2 2011, Volt sales begin in Michigan, New Jersey, Connecticut and the balance of New York and Texas
- Every state will have Volts by the end the year





## *2011 Chevrolet Volt- Awards*

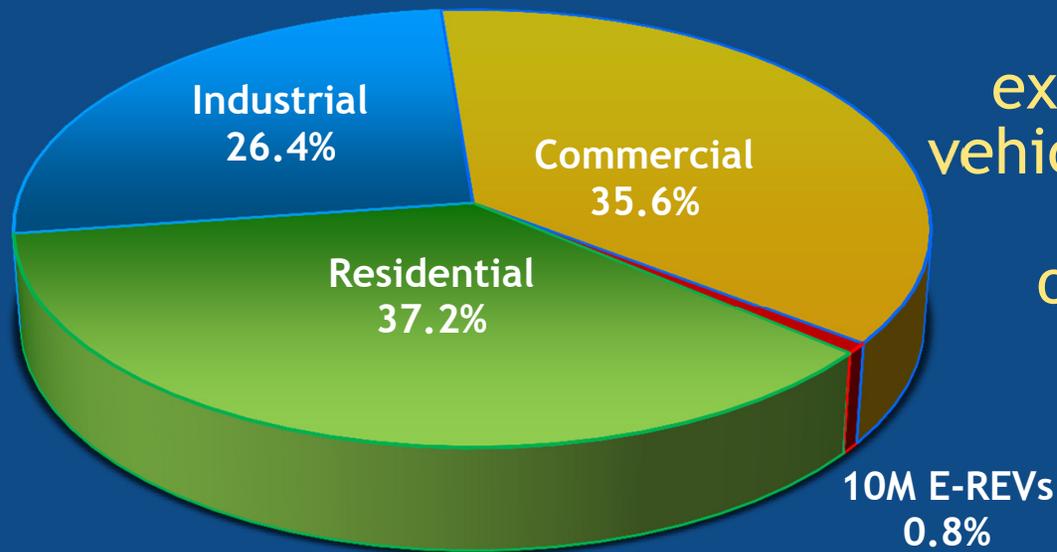
Only available since December, Volt has already accumulated numerous industry awards.

- 2011 North American Car of the Year
- Motor Trend 2011 Car of the Year
- Green Car Journal 2011 Green Car of the Year
- Car and Driver 10 Best for 2011
- Ward's AutoWorld 10 Best Engines for 2011
- AUTOMOBILE Magazine 2011 Automobile of the Year
- 2010 Breakthrough Technology, by Popular Mechanics



## Transportation's Impact on the Grid

The U.S. Electric Grid has significant capacity to support transportation



In 2010, 10 million extended-range electric vehicles would add a load of less than 1% of the total grid load

Eventually, as plug-ins become more widespread, incentives may be required to promote off-peak charging





# Utility Collaboration

GM is collaborating with more than 40 utility companies and the Electric Power Research Institute to prepare the electric infrastructure

