




**Vauxhall Ampera**  
The Real World Electric Vehicle





Powering our future with positive energy.



Our planet has been very generous. For countless years it has nourished us with its produce and then sustained our industrialised civilisation with its natural resources. But we all know that such resources are limited, hence the search for alternative sources of energy.

### **Mobility. We can't live without it.**

To keep our society functioning, we need to maintain our freedom of personal mobility. It's a hard won freedom, provided by the car. And it's now beyond question that we must provide our cars with alternative propulsion systems in order to maintain this vital mobility. Cars powered by electricity can emit zero emissions, such as CO<sub>2</sub>.

### **On the road with positive energy.**

We've all been using electricity for years, and in many ways we take it for granted. And, as far as cars are concerned, for decades it's been seen as a rather poor alternative to petrol or diesel. But the potential of the lithium-ion battery is rapidly changing this perception, making electricity an effective alternative.

At Vauxhall, we take responsibility for our planet very seriously. We are constantly improving the fuel efficiency of all our cars, reducing emissions and increasing energy diversity. Using state-of-the-art technology, our designers and engineers have developed a revolutionary car that you'll soon be able to buy. And all the time it's running on battery power alone you'll be enjoying tailpipe emission-free, near silent driving. It's called the Vauxhall Ampera, an electric car, which you can drive – electrically – way beyond the range of its battery.

Not a vision, but reality. We've come up with the idea of having an on-board generator, creating energy for the electric motor should you drive beyond battery range. So you will never have any anxiety over the range.

In essence, we have created an electric car that you can use like any conventional car. We call it 'positive energy'. That's what's powering the creation of the new Vauxhall Ampera.

***Current estimates signal that, at the present rate of fossil fuel consumption, by 2050 we must be capable of covering the world's energy needs through alternative means.***

***Electricity can be produced from a huge variety of sources including renewables like wind, solar, hydroelectric and biomass.***

Here's an electric car that will not mean a compromise to your lifestyle. Whatever's on your agenda. The daily commute, shopping, a trip into the countryside or going on holiday. Vauxhall Ampera takes it all in its electric stride.

The Vauxhall Ampera has the appearance of a stylish, dynamic conventional car. Inside, there are individual seats for four adults. And there's a sizeable luggage space accessible through the rear hatch.



***Vauxhall Ampera's on-board generator extends the car's total range beyond 310 miles once the battery's range of up to 50 miles is used up.***

***Vauxhall Ampera's state-of-the-art lithium-ion battery can be recharged from a 240v 13 amp household electricity socket in under four hours.***

#### **Driving is believing.**

It's only when you drive off that you'll notice a powerful difference to conventional cars. The near silent electric drive unit packs a mighty punch from the word 'go'. With a massive 370Nm of torque, you'll be amazed how much fun electric driving can be.

Most of us don't drive great distances every day. If your daily commute is less than 50 miles, then all you need to do is 'top up' the battery each day from a normal household electricity socket. You'll be driving tailpipe emission-free, and with a very clean conscience.

#### **Pan-European network.**

Across Europe and the UK, there are plans to develop a network of public charging points for electric cars, at the roadside and in car parks. So the ability to be always driving under electric power is becoming increasingly realistic.

For journeys longer than 50 miles, the Vauxhall Ampera's on-board engine generator, or 'range extender', seamlessly starts producing electricity to power the electric drive unit. You won't notice any difference to the way the car drives, because there is no difference. The ultra-smooth driving characteristics of the electric drive unit are with you all the way.

You don't like compromise. Neither do we.



**Freedom on demand.**

If you need to drive further before recharging the battery, you can. Just top up the engine generator's fuel tank, and off you go, powered by its electricity.

So, whatever other compromises you may have to make in your life, we at Vauxhall have pulled out all the stops to provide you with an electric car that won't compromise the way you live, work and play.

The Vauxhall Ampera. Powering our world with positive energy.



# Minimise emissions. Maximise your range. How to make electricity go further.

**Vauxhall Ampera accelerates from 0 to 60mph in under 9 seconds. Its top speed is 100mph.**

**Fuel consumption, CO<sub>2</sub> emission according to UN ECE R101 (weighted, combined, preliminary information): 175mpg, <40g/km CO<sub>2</sub>**

**85% of motorists drive 25 miles or less per day\*.**

Pure electric cars, which rely 100% on battery power, will always suffer from the limited amount of energy that can be stored in the battery. The consequent restricted range means that the way you can use such a car is also restricted. For most of us, that's just not good enough.

So what about the typical hybrid car? Well, it still uses a conventional internal combustion engine as its prime source of energy, with intermittent support from a less powerful electric motor. Some can drive very slowly on electric power alone, but only for extremely limited distances.

In contrast, Vauxhall Ampera's prime mover is the super-efficient, battery-powered electric motor, which uses the support of the on-board engine generator only when necessary. That's what we mean by using energy positively. And it overcomes the range limitations of simple battery electric cars, whilst avoiding the unavoidable compromises evident in the typical hybrid car. Here's how it's done.

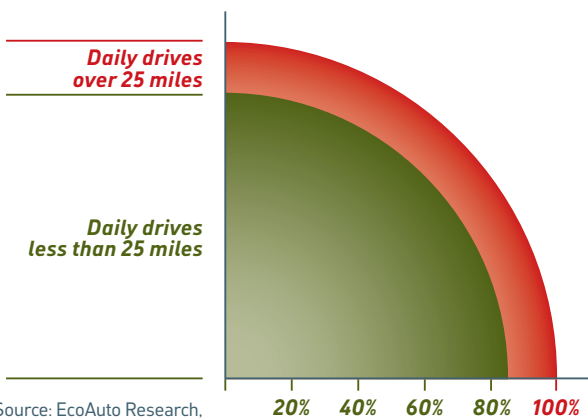
## 0 to 50 miles.

Every electric-powered car needs to be able to store electricity. For the Vauxhall Ampera, a specially designed state-of-the-art lithium-ion battery has been designed. It's a high-capacity unit, which powers the Vauxhall Ampera for up to 50 miles, with zero tailpipe CO<sub>2</sub> or other harmful emissions. It doesn't get cleaner than that.

The battery provides energy for the almost silent, purpose-built 111kW electric motor. This delivers an impressive 370Nm of torque to the front wheels. That's the kind of torque you'd normally expect from a modern V6 turbo-diesel car, but with the Vauxhall Ampera you don't have to wait for the engine revs to drive up the torque curve. It's all there from the word 'go'.

We decided on the battery-powered range of up to 50 miles because, like 85% of all drivers in the UK, you probably drive no more than 25 miles a day\*. So you'll always be driving on electricity from the battery, which you can recharge each day from a 240v 13 amp household electricity socket in less than four hours.

The battery itself is T-shaped and is located centrally in the chassis. This keeps the centre of gravity optimally low, an absolute must for balanced handling. It also means that it does not compromise the luggage space.



\*Source: EcoAuto Research. Powered by fast.MAP, UK, July 2010.



**For 50 miles to 360 miles.  
Extending the range.**

For all the arguments in favour of battery-powered electric cars, there is one huge negative: the limited range. Of course you can make a battery car drive further if you increase the size of the battery. But before you arrive at an acceptable range, you'll probably have no room for rear seats or luggage space.

Enter the range extender. This on-board generator is a compact petrol-powered engine generator whose sole purpose is to supply electricity when you want to drive beyond the range of the battery. That means it will only run within a predetermined rev band, which has been calibrated for maximum fuel efficiency. And high fuel efficiency means low CO<sub>2</sub> emissions.

Once the sophisticated battery management system detects the minimum charge level, the range extender automatically and seamlessly starts to generate electricity. All that electric motor smoothness and torque is still there, because that's what's delivering power to the front wheels. Any excess generated electricity does not go to waste, it's stored in the battery.

**Beyond 360 miles. Plug in and go.**

The most efficient way to drive further is by recharging the battery at a 240v power outlet. Again, the next 50 miles will be powered by the replenished battery.

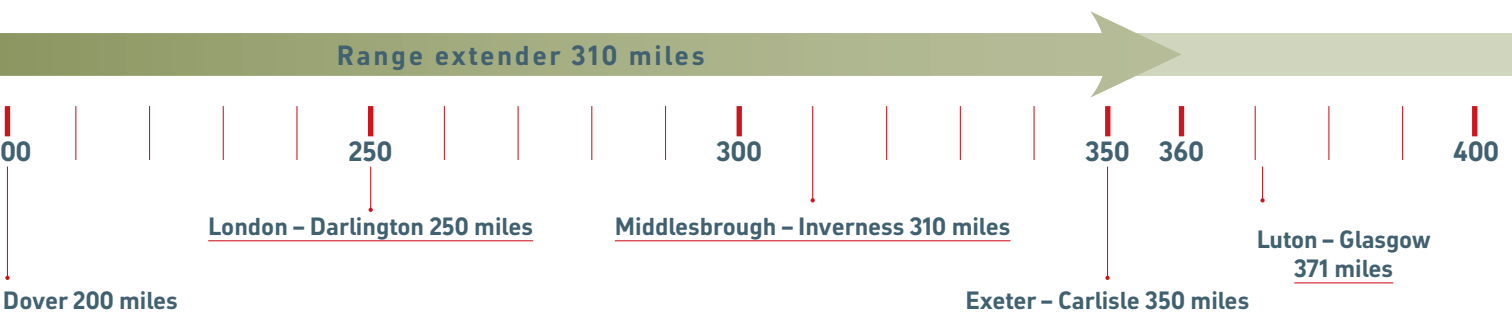
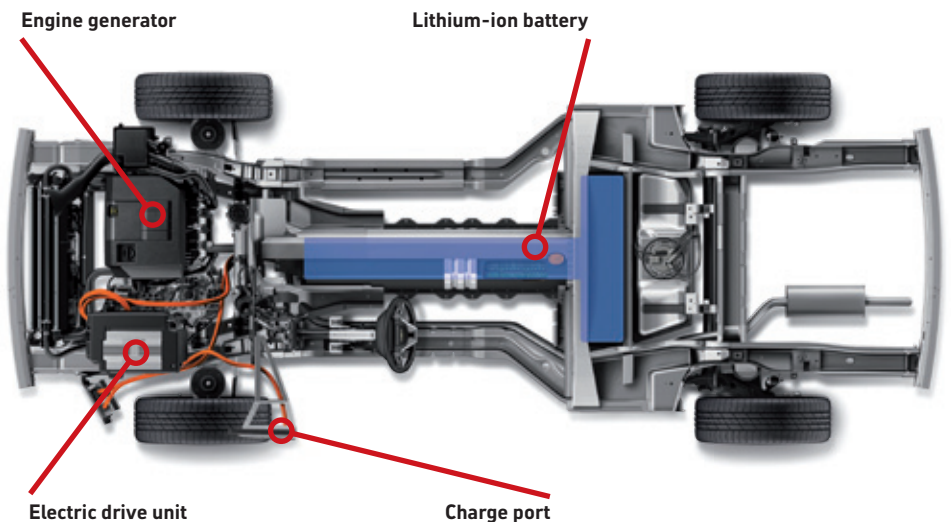
Of course it would also be possible to simply refill the fuel tank and continue indefinitely using the range extender to generate electricity, without recharging the battery. But that would not be quite as efficient as plugging in Vauxhall Ampera's on-board charge system.

Under normal driving conditions, where 85% of daily journeys are less than 25 miles, the combination of battery power and extended range technology delivers up to 175mpg, while emitting less than 40g/km of CO<sub>2</sub>. Based on ECE R101 test cycle.

*Vauxhall Ampera's purpose-built electric motor delivers 370Nm of torque. From the word 'go'.*

*Applying the brakes actually generates electricity, which is then stored in the battery.*

*The T-shaped battery is located centrally in the chassis for maximum stability.*





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