

THE NEW WORLD IN THE WORLD'S CAR INDUSTRY

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Seventy-eight percent of commuters drive 40 miles or less to and from work. If we could change the technology behind these daily drives, imagine how much gasoline and money we could save while helping reduce emissions. It might be possible with a vehicle capable of running on electricity, E85, and gasoline fuels.

The E-Flex is a new propulsion system introduced by General Motors (GM). The "E" in the E-Flex stands for "electricity" and "Flex" stands for "Flexibility".

The beauty of this electric based system is that fuel comes in 4 different varieties: electric, E85, biodiesel or worst case scenario regular gas. The real issue at hand here is not creating the power to propel a car, it is storing the power. Anyone who has owned an iPod or similar device utilizing Lithium Ion batteries can attest to fact the battery life degrades after every charge. This single issue is what is holding most car manufacturers from going from paper to production.

This term sums up in essence that the vehicle propulsion system will produce electricity, and that its platform is also flexible, a unique feature that will make it a groundbreaking achievement if it can be successfully translated into production.

The first application of this concept has been made in the Chevrolet Volt, a concept car unveiled last year.

The vehicles using this technology will be all electricity-driven. But the beauty of the E-flex systems lies in the fact that electricity will not only be produced from regenerative braking and other mechanical means, but through the use of different types of fuels. These fuels would be used to generate electricity which would charge a Lithium battery pack that would help run the car on electricity.

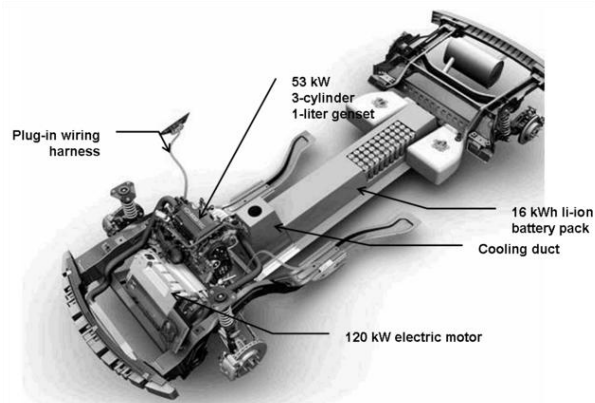


Figure 1 – Powertrain of the Chevy Volt E-Flex Concept

The emissions from a car using an E-Flex system will be drastically reduced, which will be good for the environment. GM will be able to introduce multiple propulsion systems in a common chassis capable of running on different fuels to generate electricity. The electricity finally provides the motive force for the car.

Another feature that recommends the E-Flex platform is that it is adaptable to a wide diversity of automobile types and sizes and fuel sources. This means that a variety of energy sources can be easily exploited, leading to a win-win situation for everyone.

The most important link in the system is the Lithium battery which enables the car using the E-Flex system to be charged from an electrical source as well, giving more mileage to the car using less fuel.

But while this has made the system more flexible, there is a problem in engineering a battery that is powerful enough to propel a car but affordable enough to go into mass production. Following the implementation in the cars, the E-Flex system has raised a lot of expectations in the automotive industry.

Instead of a petrol or diesel engine, E-Flex has, at its heart, a 161bhp electric motor and a 150kg, 16 kilowatt-hour lithium-ion battery. You charge this battery from the mains, or by regenerative braking, and once it's totally spent, it will have taken you around 40 miles.

What happens once the batteries have run out is just as interesting. GM is developing three different versions of the E-Flex car, each with a different crutch for its electrical propulsion system. The Volt used a turbocharged, 1.0-litre petrol engine capable of running on normal petrol, E85 bioethanol or even E100 pure ethanol. However, there is also an E-Flex chassis in the works with a hydrogen fuel cell, and one we're about to be shown, which uses GM's 1.3-litre turbodiesel engine.

In every case, the combustion engine or fuel cell serves only as a power generator; they're not attached to the wheels at all. However, they'll allow GM's new breed of EVs to go beyond commuter range; to forge up and down the interstates, autobahns and motorways of the wider world. And that, together with GM's experimental battery technology, should make them as acceptable to the masses as piston-engined cars ever were.