AN OUTLOOK TO AN E-BIKE ERA

A Nationwide Analysis Of E-Bikes Versus The Traditional Motorcycle Based On U.S. Market Trends & Forecasts In Addition To An Influx Of Increasing Gas Prices

ELECTRIC MOTORBIKE VS A TRADITIONAL MOTORCYCLE

MSRP

$5995 *after federal and state tax credits*

$8,995

$8,490

CAPACITY

Battery Type: **Brammo Power™ batteries**
Battery Pack Capacity: **6.0 kWh**
Battery Pack Voltage: **88.8 v (nominal)**
Battery Life: **500 cycles (30,000 mi) to 90% capacity**

Fuel Economy: **39.8 mpg**

TRANSMISSION

The Enertia has a **single speed direct chaindrive.** It has **no gears, shifting, or clutch.** Simply use the throttle and brakes to control the speed.

6 speed w/multiplate clutch

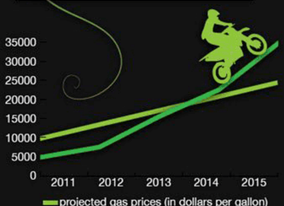
COLOR CHOICES

Can be charged with any standard plug

Can be refueled at any gas station

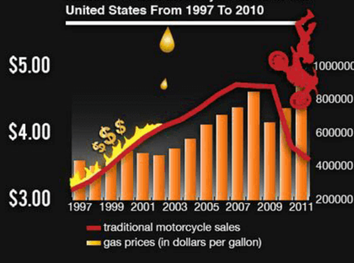
Brammo announces a 33% price drop on the Brammo Enertia: from a price of $11,995 electric motorcycle to $7995 before tax credits. The federal tax credit brings it down to $7195 and aggressive tax incentives in some states reduce the price further. In the state of Oregon, the price comes out to $5695.

Projection of U.S. Annual Average Gasoline Prices in relation to Projected Electric Motorbike Sales 2011 - 2015



In early 2011, Pike Research estimated that the U.S. market for electric motorcycles will be about 3,600 units in 2011. These sales will likely be those who are eager for environmental transportation and are motorcycle enthusiasts.

U.S. Annual Average Gasoline Prices In Relation To New Motorcycle Sales In The United States From 1997 To 2010



According to webBikeWorld, sales of new traditional gas powered motorcycles have fallen about 15% in the first half of 2010 (240,260 vehicles sold in Q1 and Q2) compared to the first half of 2009.

WHAT'S HAPPENING INSIDE THE ELECTRIC MOTORBIKE:

HOW THE MOTOR WORKS:

The Enertia is powered by an LiFePO4 Battery.

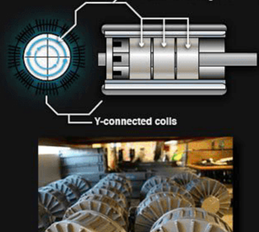
atomic structure of LiFePO4

With current lithium ion technology, LiFePO4 batteries offer many advantages over lithium cobalt dioxide (LiCoO2) batteries which are commonly used in laptops, mp3 players and cell phones.

For electric vehicles and plug-in electric cars, the LiFePO4 batteries will typically perform well in temperatures up to 400-degrees F, last for 6 to 7 years at a charge-discharge cycle of over 3,000.

In electric vehicles, LiFePO4 batteries offer greater range, power and safety. They provide full power until they are completely discharged, and recharge in just 2.5 hours. LiFePO4 chemistry is also environmentally friendly — it's the least toxic of all the battery types.

Batteries are loaded into the extruded aluminum chassis of the Brammo Enertia. The frame also acts as the battery tray. With, three batteries mounted above and three mounted below .



Perm AC Brushless Motors in production at the Ashland Facility.

FROM BATTERY TO MOTOR:

A LiFePO4 battery sends a current to the motor causing the armature to pass "through the horizontal position in which the poles of the electromagnet flip." Because of the flip, the north pole of the electromagnet is always above the axle so it can repel the field magnet's north pole and attract the field magnet's south pole.

An electric motor contains 2 small permanent magnets, a commutator, 2 brushes, and an electromagnet made by winding wire around a piece of metal. Almost always, however, the rotor will have three poles. There are two good reasons for a motor to have three poles:

It causes the motor to have better dynamics. In a two-pole motor, if the electromagnet is at the balance point, perfectly horizontal between the two poles of the field magnet when the motor starts, you can imagine the armature getting "stuck" there. That never happens in a three-pole motor.

Each time the commutator hits the point where it flips the field in a two-pole motor, the commutator shorts out the battery (directly connects the positive and negative terminals) for a moment. This shorting wastes energy and drains the battery needlessly. A three-pole motor solves this problem as well.

ADVANTAGES OF $LiFePO_4$ BATTERIES:

Safe technology — will not catch fire or explode with overcharge

Over 2000 discharge cycles life compared to typically around 300 for lead acid

Double the usable capacity of similar amp hour lead acid batteries

Virtually flat discharge curve means maximum power available until fully discharged (no "voltage sag" as with lead acid batteries)

High discharge rate capability, 10C continuous, 20C pulse discharge

Unlike lead acid batteries, can be left in a partially discharged state for extended periods without causing permanent damage

Extremely low self discharge rate (unlike lead acid which will go flat quite quickly if left sitting for long periods)

Does not suffer from "thermal runaway"

Can be used safely in high ambient temperatures of up to 60C without any degradation in performance

Maintenance free for the life of the battery

Can be operated in any orientation

Does not contain any toxic heavy metals such as lead, cadmium, nor any corrosive acids or alkalies thus making LiFePO4 batteries the most environmentally friendly battery chemistry available

LiFePO4 cells are of solid construction — there are no fragile/brittle plates made of lead which can be prone to failure over time as a result of vibration

Can be safely rapidly recharged — when fully discharged can be brought to a state of over 90% fully charged in 15 minutes