

## Comparing a Gas Scooter or Moped to an Electric Betterbike

### EZ-1AX prototype Betterbike

Cruise speed	35+ mph
Weight	51 lbs no batteries
Power	1600W/2hp + human power (Over 3 Lance Armstrongs)
Configurable Range	2-3 miles/pound of Lithium Ion Polymer battery @ 35 mph
Total weight	101lbs Range 100 - 150 miles (50 lbs batteries)
Cost of bike frame	\$900 EZ-1 AX aluminum (SX is \$700)
Cost of mid drive	\$950 (actual \$600 to \$1200 depending on kind)
Cost of hub	\$750 (Heinzman)
Fairing	\$350
Total cost no batteries	<b>\$2,950</b>

1. Assume Lithium batteries will last 3 years 1000 charges cycles  
This assumption will be more true the more you use them in parallel.
2. Assume you can throw out the negligible cost of electricity for charging (1/4 to 1/2 cent per mile)
3. Assume approximate current price of Lithium Polymer at \$60/lb (my current prices) or \$3000  
for 50lbs of batteries with the 100miles to 150 miles range above.
4. Assume gas scooters are 80 mpg 1 gallon tank so 80 miles range.
5. Assume cost of a scooter (assuming around \$3 /gallon ) is about 4 cents a mile.

### Cost of Lithium depreciation per month for various ranges

Range	Cost of batteries	Cost per month
30-50miles	\$1,000	\$27/ month
60-100 miles	\$2,000	\$54 / month (This range compares to gas scooter of 80miles)
100-150 miles	\$3,000	\$83 / month

### Cost of gas for scooter for average daily commutes

Daily commuting	Price per day	Per month
25 miles	\$1	\$25
50 miles	\$2	\$50

### Conclusion:

The cost of Lithium depreciation compared to gas consumption is similar.

You can therefore compare cost of the Betterbike without batteries to a gas scooter/motorcycle

In the future Lithium Ion Polymer (and batteries like it) will go down in depreciation cost, and gas will go up.

## Reference

Comparing EZ-1AX Betterbike with an equivalent performing scooter.

Fully loaded (150 miles range) Betterbike is less than half the weight and twice the range compared to the gas scooter below (and this is one of the smaller scooters).

The power to weight ratio of the gas scooter is ~11 Watts/ lbs of bike. (2200W / 198 (dry weight))

The 60-100 mile range Betterbike configuration weighs only 80 lbs. This is equivalent to the gas scooter's range. This is 20W per lb of bike.

The fully loaded 150 mi range would be at least 16 W /lb of bike. However, with lots of Li batteries in parallel current and voltage stays very healthy and the power is more. Often times you don't slow down adding more Lithium batteries if controller can handle the healthier current. So it could be 20W /lb as well.

So I have almost DOUBLE the power to weight ratio of the scooter below.

**Great Quality Great Selection** **Great Price**

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**Step 4**

*Additional Charge*

*(if any)*

*Description:*

gmi102-50cc Scooter

*Amount:*

0.00

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*Very sporty sleek design, tachometer gauge, great colors, front disc brake, clean operating 4 stroke motor.*



Ignition Type	CDI
Compression Ratio	10.5:1
Nominal Displacement	50cc
Fr Tyre/Air Pressure	3.50-10-4PR/38psi
Rr Tyre/Air Pressure	3.50-10-4PR/38psi

Economic Fuel Consumption	400g/kw.h
Idle Speed	1600r/min
Spark Plug	AT7C
Lubricateing Oil Type	15W/40SF
Fuel Type	Min 90 octane
Package Size	74" X 24" X 43"