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Electric Car Battery Cost

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The electric car battery cost is the most expensive part of the car. If you buy lead acid batteries, they may be **cheaper up front**, but you have to replace them 4 times or more as often as Li-Ion type batteries, and they do not hold as much charge.

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Li-Ion Recent History

Li-Ion battery packs are reported to cost from around \$500 up to \$900 USD per Kilowatt hour. On average a 24 kWh battery pack could cost you around \$17,000 or so. Some reports suggest that Nissan has managed to manufacture battery packs for the Leaf for about \$375 per kWh. That seems low in 2012.

Replacement (installed) cost for the 53 kWh Tesla Roadster batter pack runs around \$36,000. That comes to around \$679 per kWh.

Ford reports that its 23 kWh packs cost from \$12,000 - \$15,000: \$600/kWh avg.

Future Cost Estimate

Pike Research has completed a study forecasting EV Li-Ion battery prices to drop by one-third by 2017 to around \$523 per kWh. The predicted drop appears to be mainly due to market forces as the EV segment grows. Pike predicts the EV battery market will grow from \$2 billion in 2011 to \$14.6 billion in 2017.

The Envia Effect

Besides market forces, we notice that new technology will also very likely drop battery prices. The Envia Battery promises to more than double Li-Ion storage capacity while cutting weight and cost in half. Wow, sounds great. Whether or not full production at reduced price is possible, the trend toward more efficient batteries is clear. IBM for example is working on similar storage devices, as are other companies. Stay tuned.

In the Meantime DIY Battery Pack Cost Estimates

One way is to look at the price per unit. The unit in the table below is the cell. These cells are LiFePo4 batteries, 3.2-3.4 Volts per cell, from 100-260 AH per cell. Cells are sold to DIY EVer for battery pack construction. The battery management systems and chargers required to maintain the cells are not included in the costs.

Battery Cost per kWh - BMS and Chargers not included

Supplier	Volts	Amp Hours	Watt Hours	Cost	Cost/WH	Cost/kWh
EV Comp. Thundersky	3.2	160	510	\$192	\$0.38	\$375
EV Comp. Thundersky	3.2	200	640	\$240	\$0.38	\$375
EV Comp. Thundersky	3.2	260	832	\$312	\$0.38	\$375
EV Comp. Sky Energy	3.4	100	340	\$125	\$0.37	\$368
EV Comp. Sky Energy	3.4	180	612	\$225	\$0.37	\$368
Powerizer Thundersky	3.2	100	320	\$160	\$0.50	\$500
Powerizer Thundersky	3.2	160	512	\$300	\$0.59	\$586
Evolve Thundersky	3.2	100	320	\$138	\$0.43	\$431
Evolve Thundersky	3.2	160	512	\$216	\$0.42	\$422
3Xe Thundersky	3.2	160	512	\$212	\$0.42	\$404
3Xe Thundersky	3.2	200	640	\$255	\$0.40	\$398
Bite	3.2	160	512	\$208	\$0.41	\$406

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Ford Focus batteries
cost about \$600/kWh

Bloomberg New Energy Finance says
average Li-Ion EV battery prices were
\$689 per kWh in April of 2012.



The Envia Battery promises
increased storage at lower cost

A recent report says that battery prices may fall as much as 70 percent by the year 2025. Manufacturing scale effects, technology improvements, and lower component prices converge to push prices as low as \$200/kWh by 2020 and to about \$160/kWh by year 2025.

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Power	3.2	200	640	\$260	\$0.41	\$406
Elite Power	3.2	200	640	\$260	\$0.41	\$406
Average Cost/kWh						\$416

24 kWh Battery Pack Total and Per kWh Cost Estimate

Average Cost per kWh	Battery Pack Size - kWh	Pack Cost	BMS Cost	Charger Cost	Total Cost	Per kWh Cost
\$416	24	\$9,984	\$1,600	\$1,400	\$12,984	\$541

Shipping and handling costs not included

The above prices for Thundersky and Sky Energy LiFePo4 batteries are averaged to \$416 per kWh. This average price times 24 kWh gives a total battery cost of \$9,984. The BMS cost is based on only a few prices at \$1,600. The charger is likewise estimated at \$1,400. The total 24kWh pack comes to \$12,984. The average cost per kWh is \$541.

\$541 per kWh compares favorably with recent Motor Trend estimates that lithium-ion batteries presently cost around \$600/kWh.

A 24 kWh pack was chosen so as to compare costs with the Nissan Leaf. Current estimates put the cost of the 24 kWh Nissan Leaf pack at \$15,600. That averages to \$650 per kWh.

The values above reflect the estimated retail electric car battery cost for a DIY EV battery pack. Actual costs will vary of course, but the estimate gives an idea of the amount and average costs for a reasonably sized, modern EV battery pack.

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Thundersky 160AH Cell
Balqon Trucks use
Thunder Sky Batteries



Thundersky Battery Pack

