

A Possible Evaluation of Recent Battery "Overunity" Claims

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What follows is a personal speculative analysis and opinion. Your critical comments are specifically welcomed, as are alternate credible explorations...

There have been recent web claims of "overunity" lead acid battery operation from sites that include...

<http://www.tilleyfoundation.com>

<http://www.mnglobal.com/energy/pg2.htm>

<http://www.keelynet.com>

<http://www.evolvedtechnology.com>

Needless to say, the **thermodynamically challenged** have been really getting off on these topics in various newsgroups and forums.

It is somewhat difficult to treat these claims seriously owing to the obvious misunderstanding and misuse of fundamental energy measurement units clearly shown by the proponents. Specifically...

"Watts per hour" is a measure of energy use acceleration.

"COP" is the ~input~ energy ratio of a heat transfer device.

"Amperes of Power" is, of course, not even wrong.

Nonetheless, it might be appropriate to ask "Is there a simple way a small device with a mechanical or electrical input attached to a lead acid battery could cause at least a credible portion of the claimed effects?"

I believe I first looked into a probable explanation for this phenomenon in my **HACK52** found in <http://www.tinaja.com/muse/hackar3.pdf> many years ago. Additional details appeared later in <http://www.tinaja.com/glib/resbn58.pdf>.

Probably similar products (minus, of course, the overunity part) routinely appear at relatively low cost in **Battery Power Products & Technology** magazine. These are intended primarily for larger forklift batteries.

What are we looking at here?

Under certain circumstances, applying high current fractional energy pulse recharging to a lead acid chemistry **during** discharge can apparently delay somewhat the onset of polarization and increasing cell resistance. Under optimum conditions, this can sometimes raise the apparent recoverable energy density and sometimes lengthen service life as well.

Naturally, **fundamental thermodynamic principles** guarantee us there is no recoverable chemical energy that is not first placed in the battery by charging.

Normally, the pulse characteristics must be carefully matched to the particular battery chemistry, manufacturer, and load cycling.

The returned pulses often have a highly unusual waveshape which gets typically **underreported** by standard average responding meters. Often by a factor of 3:1 or so. Useful tutorials appear in <http://www.tinaja.com/glib/muse112.pdf> and in <http://www.tinaja.com/muse113.pdf>.

Further, when pulse charge recycling is in use, the open circuit battery voltage is **not** normally a meaningful indicator of remaining recoverable energy. Far more exotic and subtle measurements are mandated for realistic evaluation.

Such methods might include precision specific gravity instrumentation or else make use of **Electrochemical Impedance Spectroscopy** techniques.

Needless to say, the volumetric and gravimetric energy densities of lead acid chemistry are way too dismal to allow use of these in any forward looking personal transportation solutions. A tutorial on this topic and other energy fundamentals can be found at <http://www.tinaja.com/glib/energfun.pdf>.

Until such time as compelling and unambiguous evidence can be clearly and **independently** shown otherwise, the assumption that the claims represent a combination of **standard beginning EE student blunder #001-A** and a poorly implemented clone of a standard ho-hum off-the-shelf product cannot be fully discounted or discredited.

More at <http://www.tinaja.com/glib/bashpseu.pdf>.

Consulting services available per <http://www.tinaja.com/info01.asp>.