

IS THERE A U.S. MARKET FOR LEVs?  
IF SO - FOR WHAT AND WHEN?

# CHAPTERS

1. Intro
2. LEVs
3. How we represent ourselves today
4. What we sell today
5. Who are our customers?
6. How are electric bikes and adaptable power systems sold?
7. Stories from the store
8. What is the revolutionary distinction of the electric-assisted bike?
9. What is the distinction between a throttled and a pedal-activated electric bike?
10. What is the essence of the bicycling experience?
11. What reality must we manufacture for?

## INTRO

I have been asked to talk about my experience -- over ten years now -- as an LEV dealer in the U.S. As such we are, of course, aware first hand that our market is embarrassingly feeble. That it also appears different from the markets in China, Japan and Europe adds to the discouragement -- at the same time as it may offer some opportunities.

By now industry folks must be asking -- with perhaps consternation and impatience -- whether they are wasting their time. Is the American society such that LEVs shall happen at all? To which my own answer must be: Yes, you shall probably largely be wasting your time and LEVs -- except bikes -- shall not significantly happen. The specific conditions (cultural, economical, infrastructural etc) which have made Japan and China significant utilitarian LEV markets and also suggest that a sizable, sophisticated and diverse LEV market may emerge in Europe seem far less present in the U.S.

## LEVs

Some years ago we thought that LEVs would take off in the U.S. because rationally LEVs have so much going for them. But I came not from the bicycle industry, not from consumer goods and not from retail -- and was naive. What does rationality and facts have to do with marketing? Not much. While not exclusive to the U.S. of course, affluent (or at least spending-prone) consumers live largely in the make believe world of advertising. So effective is this dominant, rampant consumer culture that the typical consumer is likely to indignantly refute its very existence. And the goal of advertising remains, of course, to make the consumer live vicariously in the product hawked. If the product happens to be beneficial beyond generating sales it is usually coincidental.

And no product is so seductively presented and so addictively embraced as the automobile. The automobile shall remain the dominant mode of transportation until complete gridlock ensues or fuel gets out of reach for the masses. Thereafter people shall probably just sit dumbfounded in their stalled cars. The car is who we are. It is primal, it is tribal: It allows us to forage in seeming safety and comfort. It is the protective cave of our early ancestors -- but now on wheels and with air conditioning. From this perspective switching to a LEV shall seem utterly unthinkable.

## LEVs (Contd.)

That said I'll talk a little about our actual (albeit dismal) hands-on experiences with LEVs. In the '90s we sold a good little moped-scooter developed by Rick Doran, but its sub-30 mph speed and poor range contributed to its commercial demise. The story with subsequent makes and models of moped-scooters has been similar. They now look sharper and are stronger on hills but if the low top speed does not discourage customers, the spotty service support, high price or poor range will. Perhaps the range would not disappoint if it was represented as an honest 10 miles under real-traffic conditions rather than 20-30 miles (typically without explicit mention of the rarified conditions under which such distances were perhaps achieved)?

We did import the absolutely astonishing Swiss Twike three-wheeler but it asks a lot from the consumer and we sold but a handful even in the Seattle high tech boom.

## LEVs (Contd.)

Lest you think that what was lacking was marketing and visibility think again. No hype by ZAP, Lee Iacocca and TidalForce did remotely compare with what surrounded the coming of the Segway. TV talk shows were abuzz with celebrities speculating on what "it" specifically might be -- but one thing was clear to their enthralled nationwide audiences: It would completely revolutionize how we move about. I am still waiting ...

In a lapse of judgment we sold mini-scooters for a couple of years. The only argument I can offer in our defense is that we got out quicker than most. The first scooter was a nice little unit but no business can over time count on retailing something at 10 times its manufacturing cost.

Some good attempts were made by us to bring quality scooters to the U.S. market and to provide competent product support and predictable pricing. Of course, even the best among mini scooter designs do suffer inherent flaws relating to safety and hill climbing. Not that it overly matters: Which American consumer will buy a well designed, reliable, well-supported scooter from a shop that can service it when he or she can buy a gleamy, fancy-looking (but of course totally inferior) one at 1/3 the the price on the internet or from a big box store? And in the sweet rush of the purchase who needs to inquire but superficially about service -- as, after all, we prefer for it not to break down or ever require service.

## HOW WE REPRESENT OURSELVES TODAY

We are not an electric vehicle shop or even a light electric vehicle shop. One of our two product categories is the electric-assisted bicycle as defined by state and and federal laws.

We are as much about bicycling and human power augmentation as we are about electric propulsion. The most fascinating and promising area to us is to develop vehicles built with human power as an integral design component.

In our view, an electric bike must ride and handle like a pedal-only bicycle (rather than like a moped), including being conducive to pedal also in power-off mode.

We enjoy the privilege of working closely with world leading manufacturers and hope to continue to assist in bringing outstanding value electric bikes to the North American market.

# WHAT WE SELL TODAY

The Most Accomplished, Reliable and Well Supported Electric Bikes on the U.S. Market.

In 2002 we had the privilege of introducing a new class of pedal-activated or hybrid electric bikes to the American cyclist. If you have been waiting for an electric bike that is light, quiet, intuitive, that feels and handles like a regular bicycle—while still providing plenty of power for hills—then the Giant Lite may be for you. This exceptional Panasonic-powered model can claim a just-about-100% owner satisfaction rate among our Customers!

Giant's new SuedeE offers quality, performance and style at an unbeatable price. This light, cruiser style model incorporates a smooth and quiet hub motor of U.S. design produced by Sanyo, a large capacity NiMH battery for great range and Giant's patented VPC control system that offers an instant choice between pedal-activation, boost and throttle-only cruise control modes.

The eZee is the throttle-operated bike that we have worked for years to bring to the U.S. market. Four distinct models were introduced to the U.S. market in January 2006. Our initial experience could not possibly be more favorable.

Today we offer only bikes with NiMH (Nickel Metal Hydrid) and Li-Ion (Lithium-Ion) batteries.

We carry only one make of adaptable power system: the outstanding BionX

## WHO ARE OUR CUSTOMERS?

Early industry spokes persons proclaimed that electric bikes would be for students, retired folks, and environmentalists. In our view students will probably continue to walk on campus and the American Experience includes them buying a car as soon as they can (If not sooner). However, faculty and staff do buy electric bikes. As far as older customers electric bikes are not lined up outside retirement homes. However, active early retirement individuals and couples buy electric bikes. Polls suggest that about 70% of Americans refer to themselves as environmentalists. It is all in the definition, of course. We suspect that many electric bike riders care deeply about the environment but our customers rarely identify themselves as environmentalists.

Most of our customers are perfectly capable of pedaling a regular bicycle. They typically buy an electric bike because they recognize it as a distinct new vehicle category, that offers most of the advantages of the pedal-only bicycle and fewer of its shortcomings. Many electric bike customers are fit or fairly so. Fortunately, the electric bike also uniquely provides a safe, manageable and enjoyable riding experience for persons, who want to get in shape, have some injuries and disabilities or have not ridden a bicycle for years.

## WHO ARE OUR CUSTOMERS? (Contd.)

Customer reasons given for acquiring an electric bike include motivation, health, fitness, gliding up hills with ease, keeping up with riding partners, assuring an appropriate level work out including optionally arriving without a single bead of perspiration on one's brow, ease of parking, saving money, cutting down on car trips, concern for future generations, fascination with advanced technology and the satisfaction of making a purchase of great value.

However above all our customers talk above all of the sense of joy, excitement and fun the actual riding of the electric bike offers them.

What about demographics such as gender, age, education and income?

About 43% of our customers are women. Some of our most accomplished, and serious riders are of course women. We do sell electric bikes to customers in their 20's and to some in their 80's. The largest age group consists of active, independent-minded, middle-aged folks. We have many highly educated customers, although it would seem that no advanced education would be required to discern the obvious benefits of the electric bike.

## WHO ARE OUR CUSTOMERS? (Contd.)

It is not our business to ask our customers to fill out data cards checking off items such as their income bracket. We can only guess that a few electric bike riders may be wealthy. We know for sure that some are of modest means (as we own electric bikes ourselves). Household income is probably not a significant factor when considering that our high quality, low maintenance electric bikes start at \$1,000.

What can be said about owner satisfaction generally in the U.S.? Mixed at best considering the several inferior, hyped and poorly supported makes/models on the market. However, our company can claim an owner satisfaction rate of just about 100% over the last few years.

As we do not advertise much (beyond our highly visible web sites) it takes customer motivation and initiative to find us (while, of course, word of mouth has grown a major factor in our favor). Most customers contact us because they suspect that an electric bike may enhance their lives long after the blush of the original purchasing experience has paled. Fortunately, we don't get many impulse buyers.

## WHO ARE OUR CUSTOMERS? (Contd.)

Everybody(?) knows what a pedal-only bicycle is, some know what a moped or a motorcycle is but very few know what in particular a pedal-activated electric bike truly offers. We work to assist the prospective customer to first determine whether the electric bike might meet his or her individual expectations. If that seems the case we assist the customer with the selection of a make/model that shall best meet his or her riding style, uses, and budget. This usually takes several calls, emails, or visits. Customers who buy in this deliberate manner end up riding their bikes a lot and being pleased with their choice.

We do expect that the electric bike shall increasingly gain acceptance by an exceptionally broad range of individuals. Our product line does already now accommodate many different riders, a variety of uses and budgets.

## HOW ARE ELECTRIC BIKES AND ADAPTABLE POWER SYSTEMS SOLD?

All of this either adds up to a serious problem that is going to take some doing to rectify or perhaps it may just be dismissed as typical for some new products in some new markets?

Be the above as it may, dealers who do adequately assemble and service electric bikes fall in two categories: Bike shops and specialty shops.

A web search indicates that hundreds of bike shops sell electric bikes. But based on how hard it is for prospective customers to buy an electric bike locally one must conclude that very few shops actually stock them and we do know that those who do, usually sell only small numbers. The reasons here fore are as numerous as they are obvious. Bike shops are of course in the business of selling and servicing pedal-only bikes and change is difficult for many of us. Far from all bike dealers did initially embrace the e.g. mountain bike, BMX, the twist grip shifter etc. Bike mechanics cannot be expected to be familiar with electric drive systems. And it is not clear to them that quality electric bikes require very little service of the drive system, while they have heard correctly that most electric bike brands so far do develop frequent drive system problems.

## HOW ARE ELECTRIC BIKES AND ADAPTABLE POWER SYSTEMS SOLD? (Contd.)

Electric bikes are also often low-end bikes with an electric drive system and all bike shops do not enthusiastically service mass market specs bikes. Bike shops owners are typically not familiar with what an outstanding electric bike uniquely offers. Many we talk to do not yet realize that e.g. pedal-activated bikes must be pedaled for the motor-assist to kick in, i.e. anyone riding one is still a cyclist. But above all it is -- for now -- a matter of clashing cultures. The bike industry has, of course, since long been heading toward ever lighter weight, advanced componentry, more gears and an incredible selection -- while electric bikes are comparatively, few gears, rarely that cool and with very few models to choose from. As far as closing electric bikes sales a bike shop needs above all one sale person who is personally enthused about the electric bike. Otherwise the prospective customer shall feel like a a second class citizen merely for coming in and asking for an electric bike.

## HOW ARE ELECTRIC BIKES AND ADAPTABLE POWER SYSTEMS SOLD? (Contd.)

A web search for brick-and-mortar, full service specialty dealers brings up perhaps a dozen and the leading ones still only sell a few hundred electric bikes each annually -- a good percentage shipped throughout the country. In addition to electric bikes most sell scooters and some sell non-electric folders. The owners of these stores do typically not come from the bike industry but from backgrounds as varied as their motivation for engaging in this quaint pursuit. A few of these stores put out a fair message as to what the electric bikes are about, and are -- over time -- primarily responsible for what little visibility the electric bike has gained in the U.S.

It shall be interesting to see whether the specialty store or bike shop shall prevail. Clearly, there is much room and much need for both.

## STORIES FROM THE STORE

As mentioned earlier our customers are typically educated, reflective and gracious. Never-the-less on the rare occasion we come across consumers who:

(1)

Demand to know why they should pay \$1,000 for one of our bikes when they can buy another brand for \$379. Do these people also ask the Mercedes Benz dealer why they should pay \$40,000 when they can get another brand for \$7,799?

(2)

Want an electric bike that re-charges itself when they pedal -- and mind you there should be no extra effort involved. A significant portion of highschool students clearly fell asleep during science classes. Information that energy losses are dramatic and that a regen function may add only up to 15% to the range is often met with disbelief and displeasure.

## STORIES FROM THE STORE (Contd.)

(3)

Lift the electric bike exclaiming: "It is so heavy!" Once I suggested to a prospective customer that an electric bike shall unavoidably have to weigh more than a regular bike "until manufacturers come up with weightless motors and batteries" to which the person in question replied most pleasantly: "I am sure that shall happen soon!" In a rampant consumer society it is not what is that is. It is what we want it to be that is.

(4)

Are dead serious about the fun of buying a bicycle and when they ask "What happens when I ride my electric bike in the rain?" do not want to be told that they get wet. Or when, as most electricity in Seattle comes from hydro power dams, on inquiring "Does not charging an electric bike kill salmon?" they do not want to be asked: "Does switching on the light in your home kill salmon?" or "Does having salmon for dinner kill salmon?"

## WHAT IS THE REVOLUTIONARY DISTINCTION OF THE ELECTRIC-ASSISTED BICYCLE?

The Adventure of Human Power Augmentation "Augmentation, not replacement, of human power", "designed as if human power matters", and "hybrid electric bikes"? What are we talking about? We begin by questioning whether one actually wants to take the step from 100% human power as in walking or pedaling a regular bicycle, to 0% as in driving a motor vehicle. We are not aware of any means of adding power to walking.

If we were to add a human's fractional HP to the 150 HP of a 3,000 lb car the effect would not be noticeable. On the other hand the efficient and light bicycle is ideally suited for hybrid, as in human and machine together, propulsion. Only 80 Watt ( $746W=1HP$ ) is required to pedal a bicycle at 13 mph on level ground, a task considered non-strenuous and agreeable by most cyclists.

If when biking the course were always level, head winds never stirred, temperatures were always pleasantly cool, and as riders we were forever young, fit, and without ailments or injuries this whole discussion might be superfluous.

## WHAT IS THE REVOLUTIONARY DISTINCTION OF THE ELECTRIC-ASSISTED BICYCLE? (Contd.)

But as those ideal conditions are only fleetingly enjoyed we realize quickly that we shall need to develop several times 80 W when riding up a moderate hill, and must still accept cresting at reduced speed. The pedaling effort that propels use with ease on level ground has thus become woefully inadequate riding up hill.

In no way, however, do we need to abandon the human power component. We may only need to add a modest amount of motor power for our pedaling again to turn perfectly agreeable. Consequently, the hybrid electric bike is designed around a modest-to-moderate rider input as a partnership component.

The intuitive, pedal-activated system in effect "abolishes head winds", and "flattens hills". We can now ride at that heart rate that our trainer or doctor recommends, or pedal no harder than our recalcitrant knee may allow. We have the option of arriving at our destination after a full work-out, or without a single bead of perspiration on our brow.

No words (at least not mine) can convey the feeling of ease and elation from the instant, seamless power surge experienced once we lightly step down on the pedal. We are gently jolted under way, and quietly we surge down the pavement.

# WHAT IS THE DISTINCTION BETWEEN A THROTTLED AND A PEDAL-ACTIVATED ELECTRIC BIKE? WHAT WE TELL OUR CUSTOMERS:

## Throttled versus Pedal-Activated Bikes

We still encounter misunderstanding regarding how pedal-activation works and about its exceptional merit. This stands to reason as throttle control is easily comprehended (i.e. "press here for power and press harder for more power"), while pedal-activation intuitively and seamlessly augments your (under most conditions nominal or light only) pedaling.

On occasion prospective customers assume that throttle control is "better", while our actual experience has shown that when the pedal-activated system is actually experienced it is often favored by cyclists.

Will Rogers remarked: "It is not what he doesn't know that bothers me. It is what he knows for absolutely sure ... that just ain't so!" Here are our responses to five sometimes held assumptions "that just ain't so":

(1) A throttled bike is more powerful:

The power depends on the system's Watt (746 W = 1 HP) and torque ratings, not on the mode of power or speed control.

## WHAT IS THE DISTINCTION BETWEEN A THROTTLED AND A PEDAL-ACTIVATED ELECTRIC BIKE? WHAT WE TELL OUR CUSTOMERS (Contd.):

(2) A throttled bike places the rider in control, while the pedal-activated bikes does not:

The methods of control simply differ.

(3) On a throttled bike you don't have to pedal at all:

But only on level and moderate grade. And, unless the objective is to not move your legs at all (a curious one for a cyclist) you need only to pedal very lightly for the power to stay on with a pedal-activated bike.

(4) A throttled bike does not need to be pedaled up hills:

A throttled bike needs to be pedaled concurrently with the motor on a steep hill—of course, depending on what constitutes a "steep" hill, the power of the bike, the weight of the rider etc.

(5) Pedal-activated bikes are complicated:

Are we clear here what we mean by "complicated"? Certainly not complicated to learn. Does "complicated" imply "complexity", i.e. a lack of reliability, service issues etc? On the contrary—the pedal-activated and dual mode bikes we offer are exceptionally reliable and low-maintenance.

## WHAT IS THE DISTINCTION BETWEEN A THROTTLED AND A PEDAL-ACTIVATED ELECTRIC BIKE? WHAT WE TELL OUR CUSTOMERS (Contd.):

What is meant by "Power on demand" and "Pedal-Assisted"?

The term "power on demand" is sometimes used for a throttled bike. We do not use the term because a rider has just as much "power on demand" with a pedal-activated as with a throttle-controlled bike. We use the term "pedal-activated" instead of "pedal-assisted" to better describe that the power actually comes on as you lightly step on the pedal. "Assisted" may further imply something auxiliary, while the electric motor of a pedal-activated bike is up to several times stronger than the average rider.

"Electric-assisted bicycle" legislation in the U.S. does not currently differentiate between throttled-control and pedal-activation. U.S. legislation thus provides a choice of speed control method and an absurd amount of power (750 W by Federal law) and e.g. 1,000 W in our State of Washington.

# WHAT IS THE ESSENCE OF THE BICYCLING EXPERIENCE

And what might that be?

The Mystical Bicycling Experience Revealed Compared to the presumptuous car, the humble bicycle costs far less, does not bring on speeding tickets, provides exercise, may be parked free on sidewalks, bestows moral superiority, is efficiently simple, low on maintenance, can save time etc. These can be important, even crucial factors in deciding whether to ride a bike.

But what is the primary attraction, the very essence of bicycling? It is, of course, the mystical experience of actually riding a bike. This experience lies more in the area of poetry than prose, more in art than in science, more with singing in the shower than with watching TV. It can be put in words but perhaps no more effectively than having beautiful music, a gorgeous sunset, or how your dog looks at you put in words. Riding a bike is play, pure fun, and a game. It holds true for someone who has not ridden a bike in a while, and miraculously remains the ever blooming experience of the daily rider.

## WHAT IS THE ESSENCE OF THE BICYCLING EXPERIENCE (Contd.)

Mount your bike, take a few leisurely pedal strokes, and you'll marvel at how easily and far it rolls (unless, of course, you started uphill). Listen to the gently whirling wheels, and to the light crunching sound of tires on pavement or gravel. Clang your bicycle bell. It does not startle, and does not threaten. It forever announces: "Look Ma, no hands!" Riding unfailingly brings us back emotionally to our early bicycling experience. We will always remember the excitement of mastering (be it after a few bruised knees and scraped elbows) the seeming impossibility of balancing on only two wheels. We will never forget our first new and shiny bicycle (whether in actuality shiny and new or not).

Our first bicycle endowed us with fantastic speed compared to running, allowed us to venture from the neighborhood, gave us our first taste of controlling a moving machine, granted invulnerability from the mean dog down the street, and the first seductive hint of leveraged human power. Bicycling will let us relive our amazement over the effortlessness of just quietly gliding along. When young we told ourselves, on some level: "This is how Life itself will unfold for me!"

## WHAT IS THE ESSENCE OF THE BICYCLING EXPERIENCE (Contd.)

Above all, we remember what it was like to be a kid. In the face of sometimes harsh conditions in our hearts we were carefree, adventurous, noble, indomitable, and always invincible. We possessed resilient and bouncy bodies, and it would never be otherwise. The air smelled fresh (even if we grew up in the inner city, or in a factory town), food tasted heavenly, sleep was deep and delicious, right would prevail, true love was always requited, and...we would never know greater buddies.

## WHICH REALITY MUST WE MANUFACTURE FOR?

If we hold the view that our planet or at least the human species are at a cross roads -- and perhaps even in unprecedented crisis -- I'd say we cannot as business people afford to develop products for the consume-as-usual crowd (although admittedly there was a short term boom in fashion, party supplies, food and drink when the Barbarians were at the Gates of Rome and the Empire was about to fall). And now Reality stands at our Gates and the Consumer Society as we know it is about to fall.

Historically at any cross roads, in any crisis while the masses rush off into oblivion there are others who are discerning and shall steer an opposite, constructive and hopefully corrective course.

Environmental degradation, global warming (not only looming but here already), depleting resources, overpopulation (the list of calamities goes on and on) unmistakably announce that pivotal change is imminent. It is no longer a matter of "consumer choice" or "selecting a life style".

## WHICH REALITY MUST WE MANUFACTURE FOR? (Contd.)

The global picture may trouble us personally if we care about the survival of our grandchildren and other living things. It may of course trouble us in other regards depending on our values. Or it may merely trouble us because it means higher energy prices or a less breathable, congested commute to work.

Even if the above calamities were not befalling us while spend-with-abandon U.S. consumers keep piling the stuff high (and running low on credit doing so) they reportedly find themselves with less time and energy to enjoy life. The American Dream (and far from just the American variety) is turning into the Nightmare of having more and more (things and activities) while enjoying Life less and less. The long anticipated trend in the opposite direction i.e. toward simplicity, reflection, restraint, health, fiscal prudence and care vis-à-vis the next generations is not only underway but gaining momentum.

As far as bikes (any bikes) there is one huge group of consumers with money to spend now but they report feeling lost in some bike shops i.e. middle aged and active elderly people. While as mentioned the customer base for electric bikes has proven reassuringly broad, these are indeed the folks who make up our largest customer group for electric as well as folding bikes (electric or not).

## WHICH REALITY MUST WE MANUFACTURE FOR? (Contd.)

Most Americans shall no doubt keep scurrying around for "the latest and greatest" of whatever variety perhaps without much thought beyond the moment. So statements such as "what the American consumer wants" and "Americans don't like to pedal" need not hold much relevance for serious promoters of LEVs. What we need to do is to focus on the remaining several million other customers for smartly marketed LEVs including:

(a)

Those who have to change and adapt (whether they prefer to do so or not) because of global calamities resulting in higher energy prices and other out-of-pocket costs.

(b)

Those for whom the American consumer dream is fading not just because of economics but turning less and less rewarding and enjoyable. This includes of course a number of older people, who "have been there, done that".

## WHICH REALITY MUST WE MANUFACTURE FOR? (Contd.)

(c)

Middle aged and elderly non-cyclist consumers -- of all persuasions -- for whom there are currently not that many welcoming bike shops and of course way too few LEV stores.

(d)

Those Americans who never succumbed to the rampant consumer culture in the first place and who do believe that something worthwhile can exist without it appearing on tv or in huge ads. Customers from one or more of these groups are of course heavily among the ones showing up in our stores or clicking on our web sites.

Regardless of what motivates our past and current LEV customers they overwhelmingly share the sense of exceptional rider enjoyment. Let's consistently stress this rather than vacuous jingles such as "powerful motor, "it's electric", "power on demand", "personal transportation", "reinventing the wheel" etc. As far as pushing safe level exercise, losing weight, saving money, being good for the environment etc we ought not presume and rather let our customers determine and decide these matters for themselves. But we can witness to rider enjoyment because this we know first hand while others usually do not.

## WHICH REALITY MUST WE MANUFACTURE FOR? (Contd.)

Our industry has also totally fumbled the ball when it comes to representing what makes the electric-assisted bike unique, i.e. that it augments, rather than replaces human power. Let's make a concerted effort to better explain -- what perhaps 99.9% of Americans are still oblivious about -- that human power matters, that leveraging human power works extremely well in the right application and that riding in this manner is an exhilarating experience. It is indeed rare that a test rider does not return pleasantly surprised and highly enthused.

Make human power input an integral part of every LEV design. Even the 52 mph, 520 lb, two-seater Twike comes with pedals. Put pedals on all LEVs. Among those who are absolutely sure they don't want to pedal, many shall, I suspect, try it and some among them shall end up eagerly looking forward to their next pedaling adventure (despite their initial reluctance).

Promote not in terms of electric bikes but in terms of human power augmenting bikes -- HPA bikes. Most consumers have very little interest in the e.g. high efficiency of the electric motor and battery AH capacity rarely intrigues them. We may also want to bear in mind that Electric Vehicles are not well regarded in the U.S. The electric car is typically subject to jokes and other EVs are often looked upon as an inferior and misguided alternative to using the internal combustion engine.

## WHICH REALITY MUST WE MANUFACTURE FOR? (Contd.)

And for those believing that mini-scooters are ready for another round, build them as compact electric bikes. And if you do it right -- prominently as in the case of the eZee Quando -- we have a better "scooter" than any we have seen. But is it a bike or is it a scooter: Yes, it is!

As we make the full-sized electric bike ever lighter and more sophisticated consider mini-systems for e.g. high end, compact-folding folders, such as the Brompton.

People do of course love to learn that they can ride on no more energy than a 100 W bulb in their living room and that they may thus ride 20 miles on pennies worth of electricity. They are usually at least puzzled to hear that a well designed electric bike drive system may expend less total life cycle energy than the rider of a regular pedal-only bike unless such a person grows his or her own food. And the time is definitely here to offer portable photovoltaic systems for reasons ranging from just fun to complete renewable energy independence. Not even the auto industry can offer a car with its own gas station.

## WHICH REALITY MUST WE MANUFACTURE FOR? (Contd.)

And finally who ever came up with the idea that if price was low enough sales would skyrocket? On the contrary as long as we are not able to get consumers excited about LEVs does it matter whether the price is low? And beyond the blush of the purchase moment what are the chances that a very low end electric bike or scooter shall please the customer?

Customers and dealers telling manufacturers that they must come up with good electric bikes, which can retail for \$500 is an Excursion into Pure Fantasy Land. Rather I believe that in a world where "the rubber literally meets the road" a most important part of our job as dealers is to convey to our customers that they truly shall want to pay at least \$1,000 for an electric bike and be prepared to tell them why some may indeed want to spend a good deal more.

Thank you. If we have time I shall will glad to try and answer any questions or hear any comments.