

WINDLETTER

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SMALL TURBINE COLUMN:

Payback: The wrong question.

--Mick Sagrillo, Sagrillo Power & Light

When discussing wind turbines, I frequently am asked the question: “So, what’s the payback?” More often than not, the question comes from someone who just drove up in a new 4x4 full-sized, king-cab, long-bed pickup truck that serves as their “commuter” vehicle, getting a dazzling 14 miles to the gallon, maybe. I am always dumbfounded.

“Payback” for renewable energy systems is generally defined as the amount of time it takes for that system to pay for itself in energy savings. The payback period for a wind system can range from several years to several decades, depending on the cost of the system, the cost of the electricity that you are offsetting from your utility, and the average annual wind speed at the hub height of the wind turbine. Since the output of a wind turbine is directly proportional to the cube of the wind speed, small increases in wind speed can result in dramatic increases in potential output. A 10% increase in average annual wind speed, for example, results in a 33% increase in potential output of the turbine. As such, the average wind speed of the site is usually more critical to the payback period of a wind system than is the initial installed cost.

If the only reason to install a small wind system were to make money, than only folks living in windy areas would put them up. However, people install wind systems for other equally valid reasons. I know people who have stated that their system is for their children’s and grandchildren’s futures, or for a cleaner environment. There are people who put their dollars where their values are in terms of not wanting to consume nuclear- or fossil fuel-generated electricity. There are folks who simply want to support the technology because it’s the right thing to do for them. All of these reasons are more “in the community’s interest” than a matter of whether or not the owner will make money on the wind.

Dissecting our purchasing decisions

That said, there is a segment of the population that is interested in renewables, but only if they make sense economically. What baffles me is why so few of our other consumer purchases completely ignore “payback.”

For example, I can go down to the liquor store and peruse several aisles of wines that are available. These range from Mogan David 20-20 Blue (I never knew wine could be bright blue until I conducted this expedition) at \$2.25 a quart to nice vintage table or after-dinner wines at \$40 a bottle and up. Anyone who has graduated from their teenage years to middle age or beyond understands the difference between these two choices—and it's not about “payback.”

Or, imagine this: it's your wedding anniversary, and you've invited your sweetie out to dinner. Ever conscious of payback, you decide to go to a fast food take-out chain for your romantic meal rather than that new, expensive, candle-lit bistro featuring a well-known chef. What do you think the payback on that date is going to be?

And then there's the situation that I can never fully understand: investing tens of thousands of dollars in a vehicle. If the primary purpose of a vehicle is transportation, then the payback-conscious individual would consider initial cost, fuel economy, insurance, and resale value. High mileage used cars invariably come out on top of such a comparison. Instead, many people only consider the “prestige-value” of their vehicles. And number of cup holders.

Expanding on this idea, an analysis of the payback of a \$40,000 SUV versus a used vehicle versus public transportation clearly demonstrates that public transportation ‘outperforms’ the SUV by an order of magnitude. One look at the number of people taking public transportation versus single occupancy vehicles on any rush-hour afternoon in any major U.S. city expressway clearly demonstrates that people do not measure payback of their transportation choices the same way they do renewable energy investments.

Yet, we measure renewable energy with a “payback” yardstick which, if it doesn't pencil out in a “reasonable” amount of time, nixes the purchase. I frequently hear that people expect a two- to three-year payback on renewables if they are going to invest in them. I always reply that they should invest in something that makes more sense for such a quick return, like cocaine, for example.

The only purchases that I can recall that have a “payback” requirement are energy efficiency devices and renewable technologies. And, recently, hybrid vehicles. Judging from that limited number of examples, if one were a conspiracy theorist, one would assume that the fossil fuel and utility industries were behind the payback ruse.

A truly smart buy

What is most interesting is that most of our purchases depreciate in value from the time that they are purchased, while renewable energy systems not only maintain their value, they actually make money for the owner. These savings include not only the cost of the electricity generated, but also the taxes saved on not purchasing that electricity. And, wind generated electricity from a small wind turbine is inflation-resistant since, as electricity rates increase, as they invariably do, the value of the electricity generated increases as well. In that respect,, the case can be made that wind systems actually

increase in value with time, something that cannot be claimed for a shiny new car, a boat, or a swimming pool—all comparable in cost to a small wind turbine.

Many people who truly understand the value behind a small-wind purchase simply consider such an investment as prepaying their utility bill for the next 20 to 30 years, less the maintenance and repairs required during that timeframe. Or, many consider the purchase an investment in stable utility rates in an era when carbon taxes, looming on the political horizon, are predicted to seriously impact future utility rates.

Rather than simple payback, the correct question should be, “What is the return on my renewable energy investment?” No one asks what the payback is on a certificate of deposit. If renewable energy is pursued as an investment, it should be evaluated the same way that other investments are. However, this is a much more complicated analysis than it appears, requiring at least a simple spreadsheet that takes into consideration the monetary inflation rate and the escalation rate for energy costs, both of which are, at best, guesses. If you are a business, there are also depreciation and other possible tax advantages that will impact the outcome. Only after all of these “values” are plugged into a spreadsheet can you really evaluate your investment. But unless one is willing to go through with such an exercise, they will never fully understand what the true “payback” is on their renewable energy investment. If you are interested in a spreadsheet to begin your wind system return on investment analysis, you can start with two that are available on Windustry’s website at <http://windustry.org/calculator/default.htm>. These are Wind Powering America’s ‘Wind Energy Payback Period Workbook’ and ‘Bergey Wind Power Small Wind Project Calculator’. These are downloadable spreadsheets that will calculate payback (groan!) as well as return on investment on the project.

Cost-benefit analysis

Years ago I heard someone say that conventional energy economics is a value system masquerading as mathematics. This is especially true for the concept of “payback” as applied to renewable energy. The message was that “payback” of a renewable energy system considers all of the costs associated with that system, its installation, and its maintenance, but does not consider any of the many direct subsidies endowed upon conventional nuclear or fossil-fuel generation, all funded by taxpayers like you and I. Nor does the accounting take into consideration the “socialized costs” of conventional fuels, from toxic emissions, mercury pollution of lakes, and carbon loading to the cost of sending our military around the world to protect our fuel interests, all of which we pay for either directly or indirectly.

I know of several people who have installed renewable energy systems, and taken their monthly savings and invested it into a college fund for their children. Now, that’s payback...on two investments!

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