

The use of payback as the single investment metric decouples the decision of whether to purchase an on-site renewable energy project from the requirement that utility bills are a mandatory cost and must be paid. If an on-site wind project is not purchased and installed then the quantity of energy that would have been off-set by an on-site wind system still must be purchased. If an on-site wind system is installed then the energy that it generates need not be purchased from the utility.

**Method:**

The method of Net Present Value (NPV) is used to compare on-site wind projects with business as usual.

**On-Site Wind:**

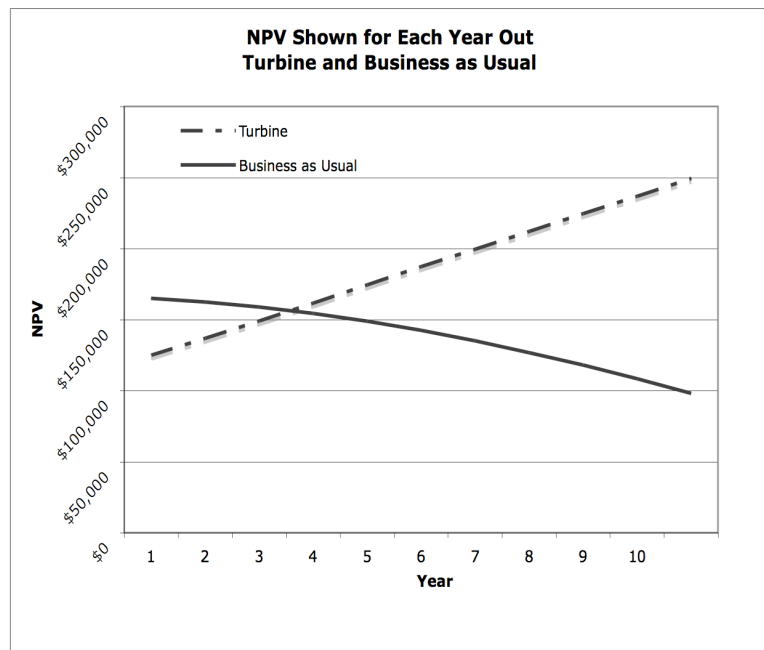
The wind turbine project, like any on-site renewable energy generation project, inherently has two cash streams; income from savings (and from the sale of renewable energy credits if sold), and expenses (O&M, insurance, debt service, etc.). The savings income stream is calculated by multiplying the quantity of energy saved by the wind turbine by the retail rate of electricity supplied by the utility. As the cost of retail energy increases the value of the energy generated by the wind turbine also increases. Included in the NPV calculation is the residual value of the wind turbine asset<sup>1</sup>. By summing the cash flows for the on-site wind project and by calculating the net present value with outlooks at years 1, 2, 3...20, the value of on-site wind with business as usual case can readily be made.

**Business as Usual:**

To compare the business as usual case with the wind turbine case a quantity of money (fund) equal to the total cost of the wind turbine project is modeled. This “fund” earns interest at the customer’s rate and is modeled to purchase the quantity of energy that would have been generated by the wind turbine at the retail rate. The retail rate is escalated at the same rate used in the wind turbine case. The net present value of the fund is calculated by discounting future cash streams back to today.

**Summary:**

In cases where the value of the fund generally is declining (the interest earnings are insufficient to pay for the amount of energy saved by the wind turbine project), on-site wind outperforms business as usual and can be shown to be a good investment.



The graph above compares On-Site Wind with Business as Usual assuming 100,000 kWh/production and \$0.10/kWh energy costs escalating with inflation. The Wind Turbine Project outperforms Business As Usual if the end-user plans to continue operations longer than four years.

<sup>1</sup> The residual value is the value of the wind turbine asset at the year the project is closed out, discounted back to today and is calculated by surveying historic and current used turbine markets. The wind turbine project must be discounted in year 1 by the cost of the installation itself.