ATTACHMENT 557

SIMPLE PAYBACK TOOL IN INVESTMENT ANALYSIS OF SUSTAINABLE ENERGY INVESTMENTS IN AGRO-INDUSTRIES-CASE OF PJ DAVE

COMPILED REFERENCES ATTACHMENT

BY

AFREPREN/FWD

COGEN FOR AFRICA PROJECT

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1. Introduction
The following is a list of research papers and reports used in preparation of the investment analysis of renewable energy technologies at PJ Dave Flower Farm.

2. Consultancy Services for Feasibility Study on Cogen Options At PJ Dave Flower Farm

Author: Bio Power Systems
Year: 2017

Abstract
This report provides an in-depth analysis of the current energy supply and consumption at PJ Dave flower farm. It then proposes various renewable energy technologies that would enhance the utilization of energy at the farm while reducing on the high costs currently incurred by the farm. The report also proposes measures that would enhance the use of renewable energy by neighbouring communities as a result of the farm’s activities.

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1) Introduction
2) Kick off, overview and general status of the site
3) Energy demand and supply
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3. Renewable Energy Investment Analysis- What’s The Payback?

Author: Benjamin Rashford, Natalie Macsalka, Milton Geiger
Year: 2013
Publisher: University of Wyoming

Abstract
Renewable energy (RE) technologies, such as solar, geothermal, and wind, are potential cost-saving investment opportunities for Wyoming homeowners and businesses. While the decision to purchase an RE system is seldom based on costs alone – social and environmental criteria also matter (e.g., how much do you value energy independence?) – purchasing an RE system is a significant financial investment. Sound investment decisions require a thorough economic analysis of expected costs and benefits. One of the most requested measures of an RE system’s economic feasibility is simple payback. Simple payback determines the number of years for the energy savings from an RE system to offset the initial cost of the investment.
4. Estimating Payback for Energy Efficiency

Author: Iowa State University
Year: 2011
Publisher: Iowa State University

Abstract

Many farmers and agribusiness owners who are investing in new or re-furbished equipment want to know how quickly the returns from reduced energy costs will help the investment reach its breakeven point. If only energy costs are considered, equipment with longer payback periods may not be economical until it nears the end of its useful life. When equipment must be replaced, consider a more complete cost analysis including initial investment, energy usage, equipment life, and maintenance costs. Saving money today by purchasing equipment with lower initial cost (and higher energy demands) puts the buyer at risk when energy prices rise in the future. This can potentially negate the savings associated with a low purchase price.

Author: Shea Winkler
Year: 2015
Publisher: University of Nebraska

Abstract
Increasingly, states are using policy and incentive to promote the development of small scale distributed solar energy generation systems (DG). Net metering is the most common state policy approach (enacted by 46 states), but various states have also enacted other incentives and different approaches to net metering. Investments with faster payback periods are more attractive to investors. In this study we analyze five different state approaches at various projected electricity cost escalation rates with respect to the payback periods for a 5-kilowatt (kW) DG. We also weigh the potential impact that proposed United State Environmental Protection Agency (EPA) regulations to 111(d) of the Clean Air Act may have on payback periods. Using the National Renewable Energy Laboratory’s (NREL) System Advisor Model (SAM), we compared the payback periods and net present value of investments (NPV) in each of the respective states over a thirty-year period. When holding other variables constant, including the 30% renewable energy federal tax credit, we find a range of payback periods and NPVs affected significantly by state policies and incentives. To a lesser extent we find that cost escalation rates have an inverse relationship with payback periods, and the proposed EPA 111(d) regulations have little to no effect on payback periods.
6. How to Determine If That Renewable Energy Project Makes Economic Sense

Author: Ben Rashford
Year: 2010

Abstract

Thinking about diversifying your home or farm energy portfolio? In addition to the big three – coal, oil, and natural gas – Wyoming also has abundant renewable energy resources, such as wind and solar power. When does investing in renewable energy (RE) make sense, and when will it break the bank? This is not easy to answer, but there are several financial calculations that can help. This article describes three calculations: simple payback, net present value, and levelized cost of energy. Each provides a different way of determining whether RE makes economic sense.

Despite ample availability of renewable energy sources in Kenya and the Feed-in-Tariff (FiT) Policy in place, actual investments in the renewable energy remain relatively small. One of the challenges in developing investments in this sector is a lack of clear, up-to-date information about how to obtain the various licenses and clearances required to construct and operate an energy project.

To encourage investment in the renewable energy sector, it is important to ensure that licensing procedures are efficient and that information regarding licensing is accessible and easy to understand. The Renewable Energy Portal was created to improve the dissemination of regulatory information by collecting all license information in one place and displaying it in a simple, user-friendly format.

The purpose of the portal is to provide easy access to relevant information about administrative entry requirements and procedures for operating a power plant based on renewable energy, as well as the legal and regulatory framework for such investments (e.g., tariff regulation) and relevant market information.

The Renewable Energy Portal provides information regarding each of the clearances issued by government agencies and local authorities that are required to start a renewable energy project. The Portal contains information on all the licensing requirements from the different issuing agencies as well as agencies that provide associated information on renewable energy projects.

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URL: http://renewableenergy.go.ke/index.php/content/17
8. Finance formulas

People from all walks of life, from students, stockbrokers and bankers; to realtors, homeowners and household managers, are finding finance formulas incredibly useful in their day-to-day lives. Whether you use the finance formulas for personal or educational reasons, having access to the right finance formulas can help improve your life.

No matter which branch of finance you work in or are studying, from corporate finance to banking, they are all built on the same foundation of standard formulas and equations. While some of these complex formulas can confuse the average person, we help by bringing clarity to you.

Whether you are dealing with compound interest, annuities, stocks, or bonds, investors must be able to effectively evaluate the level of value or merit in their financials. This is done by estimating future profits and calculating them against present values or equivalent rates of return.

URL: http://www.financeformulas.net/index.html

Author: Tze San Ong, Chun Haum Thum
Year: 2013
Publisher: International Journal of Academic Research in Business and Social Sciences

Abstract
Photovoltaic systems (PV) offer a clean, alternative energy source that is very suitable in the Malaysian climate, and consistent with the peak production and high demand in power in Malaysia. However, the application of PV systems in Malaysia is still low. The objective of this research is to determine the total cost, price/kWp system, net present value (NPV), and payback period for PV project in Malaysia. All seven projects were selected and used for the analysis and named as Project 1 to 7. The findings from this research indicate that all seven projects show a negative NPV value and payback period is more than thirty eight years. Four projects even get payback period of more than fifty years. However, an interesting projection on the price reduction shows that a positive NPV is achievable if the price/kWp system reduced to RM11,000 and RM4,000 for government subsidized and non-subsidized projects respectively. The estimation on payback period is between four to eight years with the price reduction of 85% to 50% respectively from the current market price.

Global warming, climate change, environment pollution and demand for energy represent critically issues with a wide array of potential environmental disasters affecting people health and safety. These issues are opening up new opportunities for utilization of renewable energy resources like solar photovoltaic system (PV). PV system has been widely applied in many countries such as German, Spain, Japan, US, UK and Australia but interestingly the application is rather low in Malaysia. Although Malaysia is a tropical country and located in the equator with sunlight all year round, the development of PV is still in small scale and at the beginning stage. This study is designed to find out the capital costs needed to install a PV system in Malaysia, and serve as a guideline for public when considering a PV system.