Avoided Cost of Pruning User Manual

Pruning trees away from electric power lines represents an ongoing expense. Where this expense can be avoided it is financially beneficial to the power company and ultimately the ratepayer. However, a means is required to make the determination over what time frame the action considered will provide a financial benefit.

The Avoided Cost of Pruning Model applies financial concepts to determine the value of avoided pruning and provides the net present value, the payback period and the internal rate of return, measures that are commonly used in business to assess the viability of projects.

For the reader unfamiliar with the financial concepts used to assess projects, a brief description follows.

Money is considered to have an opportunity cost and a time value. To illustrate we'll use an example. Suppose an acquaintance believes he has a great idea for a business but lacks the capital to get it started and has come to you seeking a $10,000 investment. He indicates that he will pay you back at the end of five years. You currently have the money in a certificate of deposit paying you 5% per annum. That is the your opportunity cost as you have the opportunity to leave the money in the certificate of deposit making 5% per annum. If you hold the certificate for five years you will have made more than 25% (5%X 5yrs) due to compounding of the annual interest paid. In fact, you will have a 27.6% return on your investment, which illustrates the time value of money.

Applying this thinking to an expense stream, we can say money spent in the current year has a greater cost than money that will be spent in future years. For income, current year income has greater value than income that will not be received until future years. When we wish to assess business opportunities that involve income and/or expense strings over a number of years we need a means of converting the value of future year income and expenses into their current value. This is called Present Value. It is a process of discounting income and expenses incurred in future years.

The first step then in examining alternatives to pruning is to consider a time frame and the number of pruning events avoided. The cost of all future pruning events is discounted. The Avoided Cost of Pruning Model does this by calculating the present value of the avoided pruning.

Using the Avoided Cost of Pruning Model

FINANCIAL ASSESSMENT OF ALTERNATIVES TO PRUNING

BASED ON PRESENT VALUE OF AVOIDED COST OF PRUNING

Pruning Cost	$30.00	Per Unit	**Landowner/Location Information**
Units to Prune	30	Number	
Trim Cycle	3	1 - 10 (Years)	
Tree Ownership	p	(P for private; M for municipality)	
Term	15	Years	
Discount Rate	10.00%	Based on required rate of return or opportunity cost	
Avoided Cost (PV)	**$2,968**	$ available for alternatives	
Cost of Alternative	$1,800	Total cost of implementing alternative	
Net Present Value	$1,168		© ECOSYNC 2003
			Resale and redistribution is prohibited.
Discounted Payback	6	Years	Serial Number: 00001
Internal Rate of Return	22.47%		

Pruning Cost: Enter the unit price for pruning. Units may be anything you choose; tree, square feet, acre, feet, etc.

Units to Prune: Enter the number of units of pruning that will be avoided by the alternative. The units used must be the same as those for which the cost was provided.

Trim Cycle: Enter the trim cycle. This should be based on actual experience not some target cycle that is rarely if ever achieved. Incorrect or untruthful input will lead to erroneous conclusions regarding payback period and internal rate of return.

Tree Ownership: If the trees are located on private property, enter “p”. Where a municipality, such as a city or town, owns the trees enter “m”. A distinction has been made based on ownership because when you undertake an alternative, like tree replacement, dealing with municipal trees you will likely have some form of written

agreement. As the ownership of the municipality is enduring, it is feasible to undertake projects over longer timeframes with the expectation that agreements will be honoured. In dealing with private trees, the only way to ensure any agreement made with the landowner is honoured in perpetuity is via easement. This is not a likely approach for alternatives to pruning. Thus, you are more likely to face the situation where the land ownership changes and the new owner is neither aware of the agreement you made with the previous owner nor obligated by it.

Term: This refers to reasonably expected length of term of any agreements associated with the alternative to pruning based on type of ownership. There are fields below the main display where these terms can be adjusted. It is suggested that you consider what are appropriate terms that you will use. It is important not to set terms, which are too restrictive, as most projects will be rejected based on negative present value and payback period though they have very good rates of return. It is better to set the terms to relatively long periods such as 15 years for private and 40 years for municipal ownership (40 years is the maximum). You can still apply stringent payback period hurdles as the payback is calculated. You can see in the sample display above, that the term is 15 years and the indicated payback period is 6 years.

Discount Rate: The discount rate is the opportunity cost. You may choose to use the company-required rate of return or current interest rate on deposits. Both can be justified and you may wish to check with company management regarding their preferred approach. Generally, the required rate of return will be higher than current interest on deposits. While using the required rate of return will reduce the number of projects that meet the set hurdles, it is justified by the fact that the company has the option of investing the money in other business as usual activities that will provide the required rate of return.

Avoided Cost: The avoided cost is a calculated field stating the present value of the avoided cost of pruning.

Cost of Alternative: In most cases, to avoid pruning some additional cost is encountered. If we use an example of tree replacement the additional cost would include the cost of removing the trees, the cost of the replacement trees plus any planting, establishment

	and landscaping costs (ie. stump grinding, sodding). These additional costs must be accurately tabulated for the calculated benefits to be valid.
Net Present Value:	This is a calculated field that is the difference between the Avoided Cost and the Cost of Alternative. A positive net present value indicates that the project has a positive rate of return over the Term.
Discounted Payback:	This is a calculated field providing the number of years required to reach the breakeven point. Future benefits are discounted.
Internal Rate of Return:	This is a calculated field providing the return of the project based on discounting of future income and expenses.
Landowner/Location:	Use this space to enter site location information. You may want to do a file Save As, using some unique site information reference in the new file name thereby saving a copy of the avoided pruning cost calculations specific to the site.

Examples and Applications

Use of the Avoided Cost of Pruning Model provides a simple means of creating a business case, on a case-by-case basis, for any location where you wish to examine the feasibility of an alternative to pruning. If you set the Cost of Alternative field to zero, then the Net Present Value provides the dollars available to invest in bringing the alternative to fruition. Of course, if you invest the total amount indicated, then benefits only begin to accrue after the Term.

Municipal Tree Replacement

In dealing with cities, the utility may need to be an active partner to bring tree replacement about. There is a higher probability that you can get a written agreement and you may want to set the Term to a fairly long period. The default is 40 years but you may view that as too lengthy a timeline. Perhaps you wish to use 20 or 25 years. Keep in mind that the shorter the Term, the lower the total dollars available for implementing the alternative.

Once you've set the Term, set the Cost of Alternative field to zero to reveal the dollars available. Carefully cost the potential contributions to the project to assess what you can commit to that will make business sense for your utility and the community.

Tree Vouchers

To determine the nominal value of tree vouchers, set the Units to Prune to 1. As you will incur the cost of removing the tree, enter your average fully loaded tree removal cost in the Cost of Alternative field. The Net Present Value will give you the voucher value. You may wish to round the value to the nearest $5.

Tree Removal

As pruning is a repetitive cost, utility arborists seek to avoid it by obtaining a tree removal. Is this always a good idea? No! If we examine the economics of tree removal vs. ongoing pruning we find that some removals have a negative present value. That is, it is actually cheaper to continue pruning.

To determine which trees are suitable candidates for removal, you need to have information on removal costs for various tree sizes (dbh). Enter the unit Pruning Cost, set the Units to Prune to 1, enter the Trim Cycle and in Cost of Alternative enter the cost for removing the size of tree under consideration. If the Net Present Value is positive, then it is financially sound to remove the tree, whereas if the Net Present Value is negative, it indicates that pruning the tree on the specified cycle over the length of the Term is more cost effective than removing the tree. As this accounting only considers healthy trees, you would not apply it to a hazard tree where there are negative service and financial consequences for not removing the tree.

Setting Hurdle Rates

Your company may have specific hurdle rates specified either as a payback period or a required internal rate of return. As companies prepared for competitive markets there was a trend towards very short payback periods. It's suggested that where a hurdle rate is imposed, it be based on a minimum internal rate of return rather than a payback period. As is illustrated in the screenshot above, imposing a 3 year payback would result in the rejection of an opportunity to implement a solution with a better than 22% return. That's likely twice the return your utility gets in its normal course of business. A short payback period will result in the rejection of many opportunities to invest in alternatives that yield two to three times the typical utility rate of return. Clearly the internal rate of return should be, as a minimum, the rate of return the utility typically makes. Even if the required internal rate of return is twice the typical return, it will not eliminate an inordinate number of potential projects as occurs with a short payback period.

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