

CHAPTER 7 HYDROGENERATION ECONOMIC EVALUATION

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CHAPTER 7

HYDROGENERATION ECONOMIC EVALUATION

7.0 Introduction

This chapter represents the economic analysis of the hydrogeneration facilities discussed in Chapter 6. These facilities include the Outback Hydrogeneration Facility (Outback Facility), ASR Injection Wells Hydrogeneration Facility, and the Distribution Hydrogeneration Facilities. The economic analyses of the hydropower facilities will be driven by assumptions made regarding project capital costs, operating costs, financing, revenues, tax incentives, renewable energy credits, escalation of costs and revenues, and other parameters. In general, the results of the analysis should be sufficient to indicate general project viability and to differentiate financially between the various possible options.

7.1 Construction Cost Estimate

Hydropower generation is regarded as a mature technology that is unlikely to advance. Turbine efficiency and costs have remained somewhat stable, but construction techniques and costs continue to change. Capital costs are highly dependent upon site characteristics and vary widely. Table 7-1 provides turbine size, annual power generation, and opinion of probable constructed cost in 2009 dollars for the Outback, ASR Injection Wells, and Distribution Hydrogeneration Facilities. Cost estimates were based on Drawings 7-2 through 7-5 provided in Chapter 6 and from contacting turbine generator manufacturers. Annual generation assumptions for each of the hydrogeneration facilities were gathered from Chapter 6. Detailed opinion of probable construction costs for each hydrogeneration facility is in Appendix 7-A.

Table 7-1. Probable Construction Cost Summary

Facility	Turbine size	Calculated annual power generation	Opinion of probable construction cost
Outback Facility			
Alternative 1 – Two Pelton Wheels			
Scenario I	2,000 kilowatts (kW)	11,820,000 kilowatt hours (kWh)	\$16,207,000
Scenario II	2,000 kW	9,260,000 kWh, 2013 increasing to 11,790,000 kWh by 2031 and thereafter (2012 is a partial year at 4,475,000 kWh)	
Scenario III	2,000 kW	11,820,000 kWh, 2013 – 2018 12,390,000 kWh, 2019 – 2063	
Alternative 2 – One Pelton Wheel			
Scenario I	3,000 kW	11,820,000 kWh	\$13,464,000
Scenario II	3,000 kW	9,260,000 kWh, 2013 increasing to 11,790,000 kWh by 2031 and thereafter (2012 is a partial year at 4,475,000 kWh)	
Scenario III	3,000 kW	11,820,000 kWh, 2013 – 2018 12,390,000 kWh, 2019 – 2063	
ASR Injection Wells Hydrogeneration Facility (three wells)			
Scenarios I and III	92 kW	941,000 kWh, 2013 301,000 kWh, 2023 No Generation, 2031 – 2063	\$10,299,000
Scenario II	N/A	N/A	N/A

Table 7-1. Probable Construction Cost Summary

Facility	Turbine size	Calculated annual power generation	Opinion of probable construction cost
Distribution Hydrogeneration Facilities			
Overturf	7 kW	57,000 kWh	\$902,000
Aubrey Butte	91 kW	800,000 kWh	\$1,219,000
Athletic Club	20 kW	180,000 kWh	\$935,000
Wichita	19 kW	170,000 kWh	\$984,000

The annual power generation of the Outback and ASR Injection Well Hydrogeneration Facilities depend on the water rights scenario. Scenario I assumes a Water Right Scenario 3b with full use available to generate power at the Outback Facility and the remaining water through the ASR Injection Wells Hydrogeneration Facility throughout the project life. Scenario II assumes a Water Right Scenario 3b without full use available to generate power at the Outback Facility without any excess water available to generate power from the ASR Injection Wells Hydrogeneration Facility throughout the project life. Scenario III assumes a Water Right Scenario 3b (Years 2012 to 2018) increasing to Scenario 3c (Years 2019 to 2063) with full use available to generate power at the Outback Facility and the remaining water through the ASR Injection Wells Hydrogeneration Facility throughout the project life. Therefore, Scenario III would provide the maximum power generation, followed by Scenario I, and then Scenario II. As more water becomes available, more power can be generated.

The Outback Alternative 1 has two 2-MW turbines versus Alternative 2, which has one 3-MW turbine. The additional turbine, associated piping, electrical equipment, and building increases the powerhouse construction cost approximately an additional \$2.7 million.

The ASR Injection Wells Hydrogeneration Facility cost estimate for Scenario I and III do not differ. The only difference between the two was a minor change in flow rate in one month for 2 years. This did not impact the number of wells and associated equipment for either scenario. Scenario II does not utilize the ASR Injection Wells as a source of hydrogenation and relies only on the flow going into the distribution system.

When comparing the Distribution Hydrogeneration Facilities, Aubrey Butte generates the most annual power followed by Athletic Club and Wichita.

7.2 Construction Cost Development

The approximate construction costs developed for each hydrogeneration facility compare the relative initial costs and provide a rough order-of-magnitude estimation for future planning. A summary of opinion of probable construction cost for each hydrogeneration facility is presented in the Appendix 7-A.

The costs presented herein are considered Association of the Advancement of Cost Engineering International (AACE) Class 4 cost estimates. AACE Class 4 opinions of probable cost are considered order-of-magnitude costs and have an accuracy range of minus 30 percent to plus 50 percent. Costs were developed using the following parameters.

7.2.1 General Basis of the Cost Development

- Pricing is in Second Quarter 2009 dollars
- General Requirements 10 percent
- Contractor Markups (Labor, Materials, and Equipment) 8 to 10 percent
- Bonds and Insurance 3.5 percent
- Escalation to Mid-point of Construction (October 2011) 4 percent
- Construction Contingency 30 percent
- Engineering 15 percent

7.2.2 Working Hours

- Skilled Labor Wages and Benefit
 - Source: Published Union Wage Rates collected by R. S. Means *2009 Labor Rates for the Construction Industry*, 36th Annual Edition
 - Payroll costs include workers compensation, FICA, unemployment insurance
 - Assumes 10-hour work day and 40-hour work week. No cost included for premium time or overtime penalty.
- Managements Wages, Benefits, and Payroll Costs (Source: Black & Veatch estimate)

7.2.3 Production Estimates

- Black & Veatch Engineering-Procurement-Construction/Design-Build estimation experience
- Performance based on type of equipment used during cycle times to match equipment, workers, and Construction Sequence Schedule
- Discussions with in-house and experienced Senior Field Estimators and Project Mechanical Engineer

7.2.4 Turbine and Generator Cost

- Vendor quotes for turbine and generator cost. Turbine shutoff valve included for Distribution Hydrogeneration Facilities.
- No hard bids from vendors.
- 1.3 factor on the material costs was used to estimate the installation cost.

7.2.5 Exclusions

The following considerations are excluded from the opinion of construction costs:

- Legal
- Land Acquisition
- Procurement Requirements

- Environmental Mitigation
- Construction Management
- Additional Construction Scope after award of Contract

7.2.6 Assumptions

- All general requirements are assumptions based on Black & Veatch's and Brown and Caldwell's construction estimator's judgment
- No owner-furnished equipment (assumed to simplify costing)
- Construction power furnished by Owner

7.2.7 Possible Cost Risks

- Equipment fuel, lubricants, and wear parts
- Working in limited space and lower productivity due to access constraints

7.3 Generation Interconnect Assumptions and Opinion of Probable Cost

Costs were estimated for interconnection of a new powerhouse to the nearby existing PacifiCorp substation. Interconnection costs were assumed to be similar for each Outback Facility alternative, for each ASR injection well, and distribution site. Assumptions used in this opinion of cost shown in Table 7-2 included the following:

- Profit mark-up applied to costs is 10 percent.
- Construction labor rate is \$70 per hour.
- Topographic survey and geotechnical investigation costs are not included.
- No battery required at substation.
- No additional lighting required at substation.
- Generator will be less than 800 feet from PacifiCorp distribution circuit.
- Separate contract and separate meters for energy generation and consumption.
- Outback and ASR Injection Wells Hydrogeneration Facilities share one interconnection point.

Table 7-2. Opinion of Probable Cost of Generation Interconnection	
Outback Facility	
Facility requirements	Installed cost
Equipment and material	\$200,000
Sitework	\$25,000
Engineering	\$55,000
Installation	\$150,000
PacifiCorp requirements	
Process interconnection request	\$2,000
System impact study	\$25,000
Substation engineering	\$50,000
Distribution engineering	\$30,000
15-kilovolt cable and pole riser	\$40,000
Relay modifications to substation	\$40,000
Add line potential transformers to feeder bay	\$10,000
Construction labor and management	\$60,000
Total	\$687,000
ASR Injection Hydrogeneration Facility ¹	
Facility requirements	Installed cost
Equipment and material	\$5,000
Sitework	\$3,000
Engineering	\$5,000
Installation	\$5,000
Total	\$18,000
Distribution Hydrogeneration Facility	
Facility requirements	Installed cost
Equipment and material	\$10,000
Sitework	\$3,000
Engineering	\$5,000
Installation	\$10,000
PacifiCorp requirements	
Process interconnection request and study	\$2,000
Total	\$30,000

Note: Cost includes only additional interconnection costs associated with the addition of the ASR Facility to the Outback Facility. In other words, if the Outback Facility is not built, then additional cost for interconnection of the ASR Facility would be required.

7.4 Summary of Project Development Costs

A summary of expected costs including capital, engineering design, contingencies, permitting, and mid-point of construction costs for each hydrogeneration facility, alternatives, and scenarios are presented below in Table 7-3. The totals included represent an opinion of the probable costs to develop the powerhouse and place it on line generating power. Table 7-3 includes the capital cost only and does not include costs associated with operating or maintaining a powerhouse.

7.5 Additional Considerations

The estimates developed for Alternatives I and II for the Outback Facility do not include the cost of the replacement for the Bridge Creek Intake as discussed in Chapter 3. Consequently, \$1.75 million must be added to the costs of the powerhouses and penstock in order to obtain the total cost of the project.

The present worth analysis of costs listed in Table 7-9 for the Outback Facility includes the following total costs of the project:

- The Bridge Creek Intake replacement
- The 36-inch diameter penstock
- The powerhouse including the valves, turbine, and generator
- The Pacific Power & Light interconnection facilities

Similarly, the present worth analysis of revenue for the Outback Facility listed in Table 7-10 includes all identified sources of revenue including the following:

- Oregon's Business Energy Tax Credits (50 percent of the cost of the project up to a credit of \$10 million)
- Federal Business Energy Tax (30 percent of the cost of construction)
- Federal Renewable Energy Grants
- Green Tags
- Federal Hydroelectric Production Incentives
- Federal Renewable Electric Production Tax Credits

We have not included potential funds from the Energy Trust of Oregon because it is too early in the process to obtain a commitment on the amount of funding that is available for these projects.

Given the dynamics of the economy, we have included an extraordinary contingency of 6.5 percent in our analysis of Alternative II (the 3-MW turbine alternative) to cover any unexpected volatility in material or labor costs during the course of the project.

Table 7-3 contains probable construction costs for each hydrogenation facility.

Table 7-3. Opinion of Probable Construction Cost Summary

Facility	Turbine size (kW)	Powerhouse construction cost	Inter-connection cost	Contingencies ¹	Engineering ²	Permitting ³	Mid-point of construction	Total opinion of probable capital cost
Outback Facility (Scenarios I, II, III)								
Alternative 1—Two 2-MW Pelton Wheels	2,000	\$9,020,000	\$687,000	\$2,913,000	\$1,353,000	\$818,000	\$1,416,000	\$16,207,000
Alternative 2—One 3-MW Pelton Wheel	3,000	\$7,135,000	\$687,000	\$2,347,000	\$1,173,000	\$818,000	\$1,304,000	\$13,464,000
ASR Injection Wells Hydrogeneration Facility								
Scenarios I and III	92	\$5,895,000	\$54,000	\$1,785,000	\$885,000	\$780,000	\$900,000	\$10,299,000
Scenario II	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Distribution Hydrogeneration Facilities								
Overturf	7	\$506,000	\$30,000	\$161,000	\$76,000	\$51,000	\$78,000	\$902,000
Aubrey Butte ⁴	91	\$693,000	\$30,000	\$217,000	\$104,000	\$69,000	\$106,000	\$1,219,000
Athletic Club	20	\$525,000	\$30,000	\$167,000	\$79,000	\$53,000	\$81,000	\$935,000
Wichita	19	\$554,000	\$30,000	\$176,000	\$84,000	\$55,000	\$85,000	\$984,000

¹ Aubrey Butte turbine cost assumed to be the lower pump-turbine cost instead of the Pelton wheel turbine in cost estimate.

² Contingencies are 30 percent of construction cost and interconnection cost.

³ Engineering is 15 percent of powerhouse construction.

⁴ Permitting costs for Outback Facility and ASR Injection Wells Hydrogeneration Facility are based on information provided by Brown and Caldwell. Permitting includes water rights, injection well, Federal Energy Regulatory Commission, and other permits. Distribution facilities permitting costs are assumed to be 10 percent of the powerhouse construction cost.

7.6 Operation and Maintenance (O&M) Assumptions and Costs

The O&M cost consists of mechanical equipment repairs, maintenance, one-quarter full-time-equivalent operator, and associated costs. The O&M costs assumed for each hydrogeneration facility was based on 0.05 percent of the powerhouse construction cost.

7.7 Expected Energy Valuation, Credit, and Tax Benefits

Accurate estimates of the costs associated with the construction and operation of a project over its operating life are essential in determining whether or not the project is viable economically. The level of accuracy of the assumptions made for this analysis is appropriate for the level of detail and timeline associated with these projects. Many of the financial and funding source assumptions were provided by Brown and Caldwell in Chapter 8, and were included where applicable.

7.8 Expected Energy Valuation and Renewable Energy Credit Valuation

The expected energy valuation was based on the assumption that the energy will be sold to the PacifiCorp grid, and not used behind the meter at the City of Bend (City) Water Treatment Plant site.

Renewable energy credits (RECs) are a method for accounting for renewable energy generation. They hold evidence of the production of renewable energy, and provide a methodology which enables renewable energy trade, if there is a market for the credits. The market for RECs in the western U.S. is still evolving, with REC values varying by resource and generation region. The RECs used for the purposes of this analysis include green tags, hydropower production incentive, and federal renewable electric production tax credits.

Cost of energy assumptions and value of RECs are detailed in Table 7-4.

Baseline cost of energy (COE) (cents/kWh) ^{1,2}	6.9 (Year 2013) to 66 (Year 2063)
Value of RECs (cents/kWh) ¹	
Green tags (2.2 cents/kWh inflated 5.7% per year) ¹	1 (Year 2013) to 16 (Year 2063)
Hydropower production incentive (2.2 cents/kWh inflated 5.7% per year for 10 years) ¹	2 (Year 2013) to 2.8 (Year 2023)
Federal renewable electric production tax credit (2.2 cents/kWh per year for 10 years) ¹	1 (Year 2013) to 16 (Year 2063)
COE reference year	2013

¹ Costs for a given year are listed in that year's dollars.

² Baseline cost of energy was determined from PacifiCorp's published rates from schedule 37 through Year 2025 then inflated 5.7 percent to the end of the study year.

7.9 Recognition of Associated Tax Credits, Grants, and Incentives

There are a variety of possible state and federal tax credits, grants, and incentives that possibly could be applicable to the hydrogeneration facilities. These revenue items are discussed further in Chapter 8. Table 7-5 summarizes the state and federal tax credits, grants, and incentives considered in this analysis.

Oregon Business Energy Tax Credit ¹	50 percent construction cost. Up to a \$10 million credit per program with a project partner
Federal Business Energy Investment Tax Credit ¹	30 percent of the cost of the project with a project partner
Federal Renewable Energy Grants ¹	\$200 per kW for first 2 MW (up to \$400,000)

¹ See Chapter 8.

To account for the change in the value of money over time, there are assumptions that were required regarding the timing of project construction. For example, construction costs in Year 2009 were escalated to the mid-point of construction (October 2011) at an inflated rate. The annual discount rate is utilized when determining the present worth for each of the alternatives considered by this study. Financial assumptions regarding the discount rate and annual inflated rate are given in Table 7-6.

Inflated rate, percent ^{1,2}	4
Annual discount rate, percent ¹	4

¹ Provided by Brown and Caldwell.

² For capital costs prior to Year 2013.

Table 7-7 lists the years from which energy and construction cost assumptions are referenced.

Construction cost reference year	2009
Study start year	2013
Length of study, years	50
Study end year	2063

Relevant opinion of probable construction costs for each of the hydrogeneration facilities were presented in Table 7-3. Initial capital cost estimates were gathered for each of the alternatives in Year 2009 dollars, and escalated to the mid-point of construction, as outlined in the paragraphs above. O&M costs were estimated at 0.05 percent of the escalated powerhouse construction costs (in year 2013 dollars). The capital, O&M, and total cost to year 2013 are listed in Table 7-8.

Table 7-8. Probable Opinion of Capital and O&M Cost Summary (Year 2013)

Facility	Turbine size	Capital cost ¹	Annual operation and maintenance costs ²	Total capital and O&M costs
Outback Facility (Scenarios I, II, and III)				
Alternative 1 – Two 2 MW Pelton Wheels	2 @ 2,000 kW	\$16,207,000	\$52,800	\$16,259,800
Alternative 2 – One 3 MW Pelton Wheel	3,000 kW	\$13,464,000	\$35,200	\$13,499,200
ASR Injection Wells Hydrogeneration Facility				
Scenarios I and III	92 kW	\$10,299,000	\$34,500	\$10,333,500
Scenario II	N/A	N/A	N/A	N/A
Distribution Hydrogeneration Facilities				
Overturf	7 kW	\$902,000	\$3,000	\$905,000
Aubrey Butte	91 kW	\$1,219,000	\$4,100	\$1,223,100
Athletic Club	20 kW	\$935,000	\$3,100	\$938,100
Wichita	19 kW	\$984,000	\$3,200	\$987,200

¹ Powerhouse Capital cost escalated to 2013.

² Annual O&M costs escalated to 2013 dollars (Initial value: 0.05 percent of 2009 construction cost).

7.10 Financial Analyses

The present worth of each hydrogeneration facility was calculated to determine the expected economic benefit associated with it. Revenue streams were compared to relevant costs to determine whether the hydrogeneration facility will expect a financial gain or loss over the life of the facility.

A simple payback period was calculated by determining the year when the total present worth revenue cost was equal to the total present worth capital and O&M costs. Simple payback determines the number of years required to recover the initial capital investment of a project plus the cumulative O&M costs to the payback year, given a stated revenue stream. For the purposes of this analysis, the initial capital investment and initial revenue starts in the initial study start year. The results of the present worth and payback period analyses for each of the hydrogeneration facilities are provided in Table 7-9. The detailed present worth analysis for each hydrogeneration facility is provided in Appendices 7-B through 7-E.

Note that flow Scenarios I and III include ASR injection wells to maximize the flow through the Outback turbine and to show beneficial use of the full water right. The ASR injection wells alone show a net loss and would not be constructed without the Outback powerhouse. The present worth analysis for the ASR injection wells is provided for information only and their loss net loss is included in the combined Outback powerhouse and ASR injection wells facility.

Table 7-9. 50-Year Present Worth Analysis

Facility	Turbine size, kW	Calculated annual power generation	Present worth all revenue streams	Present worth capital and O&M costs	Gain/(loss)	Simple payback period, from study start year, years
Outback Facility						
Alternative 1 – Two 2 MW Pelton Wheels						
Scenario I	2 @ 2,000	11,820,000 kWh	\$65,752,000	\$27,530,000	\$38,222,000	29
Scenario II	2 @ 2,000	9,260,000 kWh in 2013, increasing to 11,790,000 kWh by 2031 and thereafter (2012 is a partial year at 4,475,000 kWh)	\$62,967,000	\$27,530,000	\$35,437,000	30
Scenario III	2 @ 2,000	11,820,000 kWh, 2013 – 2018 12,390,000 kWh, 2019 – 2063	\$68,427,000	\$27,530,000	\$40,897,000	28
Alternative 2 – One 3 MW Pelton Wheel						
Scenario I	3,000	11,460,000 kWh	\$65,752,000	\$25,329,000	\$40,423,000	28
Scenario II	3,000	9,260,000 kWh in 2013, increasing to 11,790,000 kWh by 2031 and thereafter (2012 is a partial year at 4,475,000 kWh)	\$62,967,000	\$25,329,000	\$37,638,000	29
Scenario III	3,000	11,460,000 kWh, 2013 – 2018 12,020,000 kWh, 2019 – 2063	\$68,427,000	\$25,329,000	\$43,098,000	27
ASR Injection Wells Hydrogeneration Facility						
Scenarios I and III	92	941,000 kWh, 2013 301,000 kWh, 2023 No Generation, 2031 – 2063	\$9,668,000	\$11,074,000	(\$1,407,000)	N/A
Scenario II	N/A	N/A	N/A	N/A	N/A	N/A
Distribution Hydrogeneration Facilities						
Overturf	7	57,000 kWh	\$769,000	\$969,000	(\$200,000)	N/A
Aubrey Butte	91	800,000 kWh	\$4,345,000	\$1,310,000	\$3,034,000	6
Athletic Club	20	180,000 kWh	\$1,349,000	\$1,004,000	\$345,000	31
Wichita	19	170,000 kWh	\$1,331,000	\$1,057,000	\$274,000	34

Notes:

1. Outback Facility includes ASR injection wells for Scenarios I and III.
2. The net loss for ASR Injection Well Hydrogeneration Facility is incorporated in the Outback Facility Scenarios I and III present worth analysis.

7.11 Summary of Economic Evaluation and Recommendations

Based on these results, all of the project alternatives and scenarios for the Outback Facility appear to be very attractive from a financial perspective. The ASR Injection Wells Hydrogeneration Facility was incorporated into the Outback Facility for Scenarios I and III since both scenarios require the beneficial use of the water being injected into the wells. Outback Alternative 2 with one 3 MW Pelton wheel provides the more gain and a slightly quicker payback when compared to Alternative 1. The Outback Alternative 2, Scenario III produces the most income.

When comparing the results of the Outback Facility for Scenario II (water used for generation flows only to the distribution system) with Scenarios II and III (surplus water is used for Aquifer Storage), it is evident that inclusion of down-well hydrogeneration reduces the payback period by 1 or 2 years. That is, the additional flow through the Outback turbine combined with well generation revenue justifies the cost of well installation. When comparing the results of Scenarios I and III, the additional water rights in Scenario III (Water Rights scenario 3c) results in a net benefit of about \$2.7 million over the life of the project. The Outback Facility with single 3MW Pelton wheel turbine combined with the ASR injection wells is feasible financially given the parameters of this study and is recommended to be carried forward into predesign. Scenario II, water used for generation flows only to the distribution system is quite attractive economically returning \$37.6 million dollars more than its cost to build and operate over 50 years.

Based on the results of this economic evaluation, the Aubrey Butte, Athletic Club, and Wichita sites are feasible. Aubrey Butte is the most attractive distribution hydrogeneration site by far with a short payback period of 6 years. The Aubrey Butte site is recommended to be carried forward into predesign.

The only distribution hydrogeneration facility that appears unfeasible at this point is Overturf. Per Chapter 6, the generation for the Wichita and Athletic Club sites are based on a best case flow scenario. It is recommended that the distribution system hydraulic model and City operations staff coordinate to establish an implementable system operation plan for maximizing the constant flow point for the Wichita and Athletic Club turbines. The Overturf, Athletic Club and Wichita distribution system sites may be more attractive or may be less attractive as the economic assumptions are revised; the feasibility of these three sites are sensitive to changes in assumptions.

The financial assumptions and incentive programs presented herein are preliminary and based on the best information available at this time. It is recommended that further evaluation of the revenues be conducted as these incentive programs are finalized and the present worth analysis is updated.

We recommend that the project proceed using a single 3-MW Pelton Turbine/Generator at the Outback Facility.

Estimate of Probable Construction Cost



4800 Meadows Road, Suite 200, Lake Oswego, Oregon 97035, (503) 699-7556
B&V Project 164499.0800

Feasibility Study

**City of Bend
Bend, Oregon**

**Hydrogeneration Feasibility Study
New Powerhouse Building (WTP Pelton Turbine)**

**OPINION OF
PROBABLE CONSTRUCTION COST
June 2009**

OUTBACK SITE - ALTERNATIVE 1 TWO TURBINES SUMMARY

General Requirements, Bonds, and Insurance (13.5%)	\$1,073,000
Sitework	\$741,000
Turbine Generator Package (materials and install)	\$2,860,000
Outback Powerhouse Building	\$844,000
After-bay and Raw Water Pump Station	\$1,200,000
Piping, valves, fittings	\$712,000
Instrumentation (7%)	\$445,000
Electrical (18%)	\$1,145,000
	\$9,020,000
Turbine and Powerhouse Construction Cost Subtotal	\$9,020,000
Interconnect Fee	\$687,000
Contingencies (30% of construction cost & interconnection Fee)	\$2,913,000
Engineering (15% of construction cost)	\$1,353,000
Permitting (Water Rights and Hydro License)	\$818,000
Subtotal Probable Project Cost	\$14,791,000
Mid-Point of Construction (October 2011)	\$1,416,000
Rate = 4.0%	
Time = 2.3 years	
TOTAL PROBABLE PROJECT COST	\$16,207,000

Outback Site---Cost for a single 3 MW Turbine

General Requirements, Bonds, and Insurance	963,000.00
Sitework	492,000.00
Turbine Generator Package	1,938,000.00
Outback Powerhouse Building	697,000.00
After-bay and Raw Water Pump Station	1,200,000.00
Piping, valves, fittings,	418,000.00
Instrumentation	400,000.00
Electrical	1,027,000.00
Turbine and Powerhouse Construction Cost Subtotal	7,135,000.00
Interconnection fee	687,000.00
Contingencies	2,347,000.00
Engineering	1,173,000.00
Permitting	818,000.00
Subtotal	12,160,000.00
Mid-Point of Construction Cost	1,304,000.00
Total Probable Project Cost	13,464,000.00

Brown and Caldwell 14-Aug-09

4800 Meadows Road, Suite 200, Lake Oswego, Oregon 97035, (503) 699-7556

B&V Project 164499.0800

Feasibility Study

**City of Bend
Bend, Oregon**

**Hydrogeneration Feasibility Study
New Powerhouse Building (ASR Vertical Submersible Turbine)**

**OPINION OF
PROBABLE CONSTRUCTION COST
June 2009**

ASR INJECTION WELLS SUMMARY

General Requirements, Bonds, and Insurance (13.5%)	\$233,700
Sitework	\$167,200
ASR Well Powerhouse Building	\$1,024,600
Piping, valves, fittings	\$193,000
Instrumentation (7%)	\$97,000
Electrical (18%)	\$249,300
<hr/>	
Turbine and Powerhouse Construction Cost Subtotal each well	\$1,965,000
Interconnect Fee each well	\$18,000
Contingencies (30% of construction cost & interconnection Fee) each well	\$595,000
Engineering (15% of construction cost) each well	\$295,000
Permitting each well	\$260,000
Subtotal Probable Project Cost each ASR Injection Well	\$3,133,000
Mid-Point of Construction (October 2011) each well	\$300,000
Rate = 4.0%	
Time = 2.3 years	
Subtotal Probable Project Cost each ASR Injection Well	\$3,433,000
TOTAL PROBABLE PROJECT COST (Total 3 ASR Injection Wells)	\$10,299,000

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B&V Project 164499.0800

Feasibility Study

**City of Bend
Bend, Oregon**

**Hydrogeneration Feasibility Study
New Powerhouse Building (Distribution System Turbines)**

**OPINION OF
PROBABLE CONSTRUCTION COST
June 2009**

OVERTURF - DISTRIBUTION SYSTEM SUMMARY

Overturf General Requirements, Bonds, and Insurance (13.5%)	\$60,100
Sitework	\$37,000
Turbine Generator Package (materials and install)	\$71,500
Distribution Powerhouse Building	\$182,400
Piping, valves, fittings	\$65,500
Instrumentation (7%)	\$25,000
Electrical (18%)	\$64,200
Turbine and Powerhouse Construction Cost Subtotal	\$506,000
Interconnect Fee	\$30,000
Contingencies (30% of construction cost & interconnection fee)	\$161,000
Engineering (15% of construction cost)	\$76,000
Permitting (10% of construction cost)	\$51,000
Subtotal Probable Project Cost	\$824,000
Mid-Point of Construction (October 2011)	\$78,000
Rate = 4.0%	
Time = 2.3 years	
TOTAL PROBABLE PROJECT COST	\$902,000



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B&V Project 164499.0800

Feasibility Study

**City of Bend
Bend, Oregon**

**Hydrogeneration Feasibility Study
New Powerhouse Building (Distribution System Turbines)**

**OPINION OF
PROBABLE CONSTRUCTION COST
June 2009**

AWBREY BUTTE - DISTRIBUTION SYSTEM SUMMARY

Awbrey Butte Feed General Requirements, Bonds, and Insurance (13.5%)	\$82,400
Sitework	\$37,000
Turbine Generator Package (materials and install)	\$123,500
Distribution Powerhouse Building	\$182,400
Piping, valves, fittings	\$145,100
Instrumentation (7%)	\$34,200
Electrical (18%)	\$87,900
Turbine and Powerhouse Construction Cost Subtotal	\$693,000
Interconnect Fee	\$30,000
Contingencies (30% of construction cost & interconnection fee)	\$217,000
Engineering (15% of construction cost)	\$104,000
Permitting (10% of construction cost)	\$69,000
Subtotal Probable Project Cost	\$1,113,000
Mid-Point of Construction (October 2011)	\$106,000
Rate = 4.0%	
Time = 2.3 years	
TOTAL PROBABLE PROJECT COST	\$1,219,000



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Feasibility Study

**City of Bend
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**Hydrogeneration Feasibility Study
New Powerhouse Building (Distribution System Turbines)**

**OPINION OF
PROBABLE CONSTRUCTION COST
June 2009**

ATHLETIC CLUB - DISTRIBUTION SYSTEM SUMMARY

Athletic Club General Requirements, Bonds, and Insurance (13.5%)	\$62,300
Sitework	\$37,000
Turbine Generator Package (materials and install)	\$84,500
Distribution Powerhouse Building	\$182,400
Piping, valves, fittings	\$65,500
Instrumentation (7%)	\$25,900
Electrical (18%)	\$66,500
Turbine and Powerhouse Construction Cost Subtotal	\$525,000
Interconnect Fee	\$30,000
Contingencies (30% of construction cost & interconnection fee)	\$167,000
Engineering (15% of construction cost)	\$79,000
Permitting (10% of construction cost)	\$53,000
Subtotal Probable Project Cost	\$854,000
Mid-Point of Construction (October 2011)	\$81,000
Rate = 4.0%	
Time = 2.3 years	
TOTAL PROBABLE PROJECT COST	\$935,000

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B&V Project 164499.0800



**City of Bend
Bend, Oregon**

**Hydrogeneration Feasibility Study
New Powerhouse Building (Distribution System Turbines)**

**OPINION OF
PROBABLE CONSTRUCTION COST
June 2009**

WICHITA - DISTRIBUTION SYSTEM SUMMARY

Wichita General Requirements, Bonds, and Insurance (13.5%)	\$66,000
Sitework	\$37,000
Turbine Generator Package (materials and install)	\$88,400
Distribution Powerhouse Building	\$182,400
Piping, valves, fittings	\$82,400
Instrumentation (7%)	\$27,400
Electrical (18%)	\$70,300
Turbine and Powerhouse Construction Cost Subtotal	\$554,000
Interconnect Fee	\$30,000
Contingencies (30% of construction cost & interconnection fee)	\$176,000
Engineering (15% of construction cost)	\$84,000
Permitting (10% of construction cost)	\$55,000
Subtotal Probable Project Cost	\$899,000
Mid-Point of Construction (October 2011)	\$85,000
Rate = 4.0%	
Time = 2.3 years	
TOTAL PROBABLE PROJECT COST	\$984,000

Present Worth Analysis for Outback Alternative 1 Scenarios I, II and III

Outback Alternative 1																						
Scenario I																						
Two Pelton turbines at the Outback Site																						
Present Worth Analysis Worksheet - Conceptual and Comparative																						
Total 50-year Present Worth		Total	Outback	ASR																		
Present Worth of Revenues		\$ 77,421,766	\$ 67,754,210	\$ 9,667,557																		
Present Worth of Costs		\$ 54,087,395	\$ 43,013,174	\$ 11,074,221																		
Gain / (Loss)		\$ 23,334,371	\$ 24,741,036	(\$ 1,406,665)																		
Capital Costs		\$ 41,827,000																				
Turbine and Powerhouse Construction Cost		\$ 9,020,000																				
Operation and Maintenance Costs																						
O&M Costs (Start year, @ 0.05% of Construction Cost)		\$ 52,761																				
Period Number		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Revenues																						
Electrical Sales Revenue																						
Cost of Energy (\$/KWh) ^{1,2}		0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148	0.156
Annual Energy Production (MWh)		11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820
Total Electricity Sales Revenues		\$ 1,288,380	\$ 1,312,020	\$ 1,347,480	\$ 1,394,760	\$ 1,430,220	\$ 1,465,680	\$ 1,501,140	\$ 1,548,420	\$ 1,583,880	\$ 1,595,700	\$ 1,158,360	\$ 1,170,180	\$ 1,182,000	\$ 1,252,920	\$ 1,323,840	\$ 1,394,760	\$ 1,477,500	\$ 1,560,240	\$ 1,642,980	\$ 1,749,360	\$ 1,843,920
Tax Credits, Grants, Incentives																						
Oregon Business Energy Tax Credit (50% construction cost up to \$10 million/program)		\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000																
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²		\$ 400,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²		\$ 400,000																				
Energy Trust of Oregon (10% Capital Cost) ²		\$ 4,182,700																				
Total Revenue		\$ 8,271,080	\$ 3,312,020	\$ 3,347,480	\$ 3,394,760	\$ 3,430,220	\$ 1,465,680	\$ 1,501,140	\$ 1,548,420	\$ 1,583,880	\$ 1,595,700	\$ 1,158,360	\$ 1,170,180	\$ 1,182,000	\$ 1,252,920	\$ 1,323,840	\$ 1,394,760	\$ 1,477,500	\$ 1,560,240	\$ 1,642,980	\$ 1,749,360	\$ 1,843,920
Total Costs																						
Capital Cost Expenditures		\$ 41,827,000																				
O&M Expenditures		\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Total Cost		\$ 41,879,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Present Worth Analysis																						
Present Worth Factor		1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746	0.4564
Present Worth Total Revenues		\$ 8,271,080	\$ 3,184,635	\$ 3,094,933	\$ 3,017,929	\$ 2,932,166	\$ 1,204,682	\$ 1,186,373	\$ 1,176,672	\$ 1,157,326	\$ 1,121,118	\$ 782,547	\$ 760,127	\$ 738,274	\$ 752,471	\$ 764,485	\$ 774,461	\$ 788,849	\$ 800,985	\$ 811,021	\$ 830,320	\$ 841,541
Present Worth Capital Cost Expenditures		\$ 41,827,000																				
Present Worth O&M Expenditures		\$ 52,761	\$ 50,731	\$ 48,780	\$ 46,904	\$ 45,100	\$ 43,365	\$ 41,697	\$ 40,094	\$ 38,552	\$ 37,069	\$ 35,643	\$ 34,272	\$ 32,954	\$ 31,687	\$ 30,468	\$ 29,296	\$ 28,169	\$ 27,086	\$ 26,044	\$ 25,042	\$ 24,079
Present Worth Total Cost		\$ 41,879,761	\$ 50,731	\$ 48,780	\$ 46,904	\$ 45,100	\$ 43,365	\$ 41,697	\$ 40,094	\$ 38,552	\$ 37,069	\$ 35,643	\$ 34,272	\$ 32,954	\$ 31,687	\$ 30,468	\$ 29,296	\$ 28,169	\$ 27,086	\$ 26,044	\$ 25,042	\$ 24,079
Outback Payback Period																						
		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Outback and ASR Hydrogeneration Facilities Payback Period																						
		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																						
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																						
2. Values based on Jim Doanes email 6-10-2010																						

Outback Alternative 1																						
Scenario I																						
Two Pelton turbines at the Outback Site																						
Present Worth Analysis Worksheet - Conceptual and Comparative																						
Total 50-year Present Worth		Total																				
Present Worth of Revenues		\$ 77,421,766																				
Present Worth of Costs		\$ 54,087,395																				
Gain / (Loss)		\$ 23,334,371																				
Capital Costs		\$ 41,827,000																				
Turbine and Powerhouse Construction Cost		\$ 9,020,000																				
Operation and Maintenance Costs																						
O&M Costs (Start year, @ 0.05% of Construction Cost)		\$ 52,761																				
Period Number	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
Year	2013	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	
Total Revenues																						
Electrical Sales Revenue																						
Cost of Energy (\$/KWh) ^{1,2}		0.109	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447	0.473
Annual Energy Production (MWh)		11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820
Total Electricity Sales Revenues		\$ 1,288,380	\$ 1,950,300	\$ 2,056,680	\$ 2,174,880	\$ 2,304,900	\$ 2,434,920	\$ 2,564,940	\$ 2,718,600	\$ 2,872,260	\$ 3,037,740	\$ 3,215,040	\$ 3,392,340	\$ 3,581,460	\$ 3,782,400	\$ 4,006,980	\$ 4,231,560	\$ 4,479,780	\$ 4,728,000	\$ 4,999,860	\$ 5,283,540	\$ 5,590,860
Tax Credits, Grants, Incentives																						
Oregon Business Energy Tax Credit (50% construction cost up to \$10 million/program)		\$ 2,000,000																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²		\$ 400,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²		\$ 400,000																				
Energy Trust of Oregon (10% Capital Cost) ²		\$ 4,182,700																				
Total Revenue		\$ 8,271,080	\$ 1,950,300	\$ 2,056,680	\$ 2,174,880	\$ 2,304,900	\$ 2,434,920	\$ 2,564,940	\$ 2,718,600	\$ 2,872,260	\$ 3,037,740	\$ 3,215,040	\$ 3,392,340	\$ 3,581,460	\$ 3,782,400	\$ 4,006,980	\$ 4,231,560	\$ 4,479,780	\$ 4,728,000	\$ 4,999,860	\$ 5,283,540	\$ 5,590,860
Total Costs																						
Capital Cost Expenditures		\$ 41,827,000																				
O&M Expenditures		\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Total Cost		\$ 41,879,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Present Worth Analysis																						
Present Worth Factor		1.0000	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166	0.2083
Present Worth Total Revenues		\$ 8,271,080	\$ 855,857	\$ 867,827	\$ 882,406	\$ 899,191	\$ 913,379	\$ 925,146	\$ 942,856	\$ 957,834	\$ 974,056	\$ 991,257	\$ 1,005,694	\$ 1,020,924	\$ 1,036,734	\$ 1,056,048	\$ 1,072,343	\$ 1,091,582	\$ 1,107,755	\$ 1,126,396	\$ 1,144,524	\$ 1,164,515
Present Worth Capital Cost Expenditures		\$ 41,827,000																				
Present Worth O&M Expenditures		\$ 52,761	\$ 23,153	\$ 22,263	\$ 21,406	\$ 20,583	\$ 19,791	\$ 19,030	\$ 18,298	\$ 17,594	\$ 16,918	\$ 16,267	\$ 15,641	\$ 15,040	\$ 14,461	\$ 13,905	\$ 13,370	\$ 12,856	\$ 12,362	\$ 11,886	\$ 11,429	\$ 10,989
Present Worth Total Cost		\$ 41,879,761	\$ 23,153	\$ 22,263	\$ 21,406	\$ 20,583	\$ 19,791	\$ 19,030	\$ 18,298	\$ 17,594	\$ 16,918	\$ 16,267	\$ 15,641	\$ 15,040	\$ 14,461	\$ 13,905	\$ 13,370	\$ 12,856	\$ 12,362	\$ 11,886	\$ 11,429	\$ 10,989
Outback Payback Period																						
		no	no	no	no	no	no	no	no	no	29	30	31	32	33	34	35	36	37	38	39	40
Outback and ASR Hydrogeneration Facilities Payback Period																						
		no	no	no	no	no	no	no	no	no	no	30	31	32	33	34	35	36	37	38	39	40
Notes:																						
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																						
2. Values based on Jim Doanes email 6-10-2010																						

Outback Alternative 1											
Scenario I											
Two Pelton turbines at the Outback Site											
Present Worth Analysis Worksheet - Conceptual and Comparative											
Total 50-year Present Worth											
Present Worth of Revenues	Total										
Present Worth of Costs											
Gain / (Loss)											
Capital Costs											
Turbine and Powerhouse Construction Cost											
Operation and Maintenance Costs											
O&M Costs (Start year, @ 0.05% of Construction Cost)											
Period Number	0	41	42	43	44	45	46	47	48	49	50
Year	2013	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues											
Electrical Sales Revenue											
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820	11,820
Total Electricity Sales Revenues	\$ 1,288,380	\$ 5,898,180	\$ 6,240,960	\$ 6,583,740	\$ 6,973,800	\$ 7,363,860	\$ 7,789,380	\$ 8,226,720	\$ 8,699,520	\$ 9,195,960	\$ 9,716,040
Tax Credits, Grants, Incentives											
Oregon Business Energy Tax Credit (50% construction cost up to \$10 million/program)	\$ 2,000,000										
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 400,000										
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 400,000										
Energy Trust of Oregon (10% Capital Cost) ²	\$ 4,182,700										
Total Revenue	\$ 8,271,080	\$ 5,898,180	\$ 6,240,960	\$ 6,583,740	\$ 6,973,800	\$ 7,363,860	\$ 7,789,380	\$ 8,226,720	\$ 8,699,520	\$ 9,195,960	\$ 9,716,040
Total Costs											
Capital Cost Expenditures	\$ 41,827,000										
O&M Expenditures	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Total Cost	\$ 41,879,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Present Worth Analysis											
Present Worth Factor	1.0000	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 8,271,080	\$ 1,181,275	\$ 1,201,852	\$ 1,219,099	\$ 1,241,660	\$ 1,260,681	\$ 1,282,240	\$ 1,302,146	\$ 1,324,021	\$ 1,345,747	\$ 1,367,169
Present Worth Capital Cost Expenditures	\$ 41,827,000										
Present Worth O&M Expenditures	\$ 52,761	\$ 10,567	\$ 10,160	\$ 9,770	\$ 9,394	\$ 9,033	\$ 8,685	\$ 8,351	\$ 8,030	\$ 7,721	\$ 7,424
Present Worth Total Cost	\$ 41,879,761	\$ 10,567	\$ 10,160	\$ 9,770	\$ 9,394	\$ 9,033	\$ 8,685	\$ 8,351	\$ 8,030	\$ 7,721	\$ 7,424
Outback Payback Period											
	no	41	42	43	44	45	46	47	48	49	50
Outback and ASR Hydrogeneration Facilities Payback Period											
	no	41	42	43	44	45	46	47	48	49	50
Notes:											
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009											
2. Values based on Jim Doanes email 6-10-2010											

Outback Alternative 1																					
Scenario II																					
Two Pelton turbines at the Outback Site																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$65,602,289																				
Present Worth of Costs	\$43,013,174																				
Gain / (Loss)	\$22,589,115																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$ 41,827,000																				
	\$ 9,020,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 52,761																				
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148	0.156
Annual Energy Production (MWh)	9,260	9,450	9,640	9,830	10,010	10,200	10,390	10,540	10,680	10,830	10,970	11,110	11,260	11,400	11,540	10,680	11,750	11,790	11,790	11,790	11,790
Total Electricity Sales Revenues	\$ 1,009,340	\$1,048,950	\$1,098,960	\$1,159,940	\$1,211,210	\$1,264,800	\$1,319,530	\$1,380,740	\$1,431,120	\$1,462,050	\$1,075,060	\$1,099,890	\$1,126,000	\$1,208,400	\$1,292,480	\$1,260,240	\$1,468,750	\$1,556,280	\$1,638,810	\$1,744,920	\$1,839,240
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000																
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 4,182,700																				
Total Revenue	\$ 7,992,040	\$3,048,950	\$3,098,960	\$3,159,940	\$3,211,210	\$1,264,800	\$1,319,530	\$1,380,740	\$1,431,120	\$1,462,050	\$1,075,060	\$1,099,890	\$1,126,000	\$1,208,400	\$1,292,480	\$1,260,240	\$1,468,750	\$1,556,280	\$1,638,810	\$1,744,920	\$1,839,240
Total Costs																					
Capital Cost Expenditures	\$41,827,000																				
O&M Expenditures	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	
Total Cost	\$41,879,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	
Present Worth Analysis																					
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746	0.4564
Present Worth Total Revenues	\$ 7,992,040	\$2,931,683	\$2,865,163	\$2,809,175	\$2,744,956	\$1,039,573	\$1,042,844	\$1,049,249	\$1,045,705	\$1,027,217	\$ 726,272	\$ 714,468	\$ 703,296	\$ 725,734	\$ 746,375	\$ 699,767	\$ 784,178	\$ 798,953	\$ 808,963	\$ 828,213	\$ 839,405
Present Worth Capital Cost Expenditures	\$41,827,000																				
Present Worth O&M Expenditures	\$ 52,761	\$ 50,731	\$ 48,780	\$ 46,904	\$ 45,100	\$ 43,365	\$ 41,697	\$ 40,094	\$ 38,552	\$ 37,069	\$ 35,643	\$ 34,272	\$ 32,954	\$ 31,687	\$ 30,468	\$ 29,296	\$ 28,169	\$ 27,086	\$ 26,044	\$ 25,042	\$ 24,079
Present Worth Total Cost	\$41,879,761	\$ 50,731	\$ 48,780	\$ 46,904	\$ 45,100	\$ 43,365	\$ 41,697	\$ 40,094	\$ 38,552	\$ 37,069	\$ 35,643	\$ 34,272	\$ 32,954	\$ 31,687	\$ 30,468	\$ 29,296	\$ 28,169	\$ 27,086	\$ 26,044	\$ 25,042	\$ 24,079
Payback Period																					
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Outback Alternative 1																					
Scenario II																					
Two Pelton turbines at the Outback Site																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$65,602,289																				
Present Worth of Costs	\$43,013,174																				
Gain / (Loss)	\$22,589,115																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$ 41,827,000																				
	\$ 9,020,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 52,761																				
Period Number	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Year	2013	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447	0.473
Annual Energy Production (MWh)	9,260	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790
Total Electricity Sales Revenues	\$ 1,009,340	\$1,945,350	\$2,051,460	\$2,169,360	\$2,299,050	\$2,428,740	\$2,558,430	\$2,711,700	\$2,864,970	\$3,030,030	\$3,206,880	\$3,383,730	\$3,572,370	\$3,772,800	\$3,996,810	\$4,220,820	\$4,468,410	\$4,716,000	\$4,987,170	\$5,270,130	\$5,576,670
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 4,182,700																				
Total Revenue	\$ 7,992,040	\$1,945,350	\$2,051,460	\$2,169,360	\$2,299,050	\$2,428,740	\$2,558,430	\$2,711,700	\$2,864,970	\$3,030,030	\$3,206,880	\$3,383,730	\$3,572,370	\$3,772,800	\$3,996,810	\$4,220,820	\$4,468,410	\$4,716,000	\$4,987,170	\$5,270,130	\$5,576,670
Total Costs																					
Capital Cost Expenditures	\$41,827,000																				
O&M Expenditures	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	
Total Cost	\$41,879,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166	0.2083
Present Worth Total Revenues	\$ 7,992,040	\$ 853,685	\$ 865,625	\$ 880,166	\$ 896,909	\$ 911,061	\$ 922,798	\$ 940,462	\$ 955,403	\$ 971,583	\$ 988,741	\$1,003,141	\$1,018,332	\$1,034,102	\$1,053,368	\$1,069,621	\$1,088,812	\$1,104,944	\$1,123,537	\$1,141,619	\$1,161,559
Present Worth Capital Cost Expenditures	\$41,827,000																				
Present Worth O&M Expenditures	\$ 52,761	\$ 23,153	\$ 22,263	\$ 21,406	\$ 20,583	\$ 19,791	\$ 19,030	\$ 18,298	\$ 17,594	\$ 16,918	\$ 16,267	\$ 15,641	\$ 15,040	\$ 14,461	\$ 13,905	\$ 13,370	\$ 12,856	\$ 12,362	\$ 11,886	\$ 11,429	\$ 10,989
Present Worth Total Cost	\$41,879,761	\$ 23,153	\$ 22,263	\$ 21,406	\$ 20,583	\$ 19,791	\$ 19,030	\$ 18,298	\$ 17,594	\$ 16,918	\$ 16,267	\$ 15,641	\$ 15,040	\$ 14,461	\$ 13,905	\$ 13,370	\$ 12,856	\$ 12,362	\$ 11,886	\$ 11,429	\$ 10,989
Payback Period																					
	no	no	no	no	no	no	no	no	no	no	no	31	32	33	34	35	36	37	38	39	40
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Outback Alternative 1											
Scenario II											
Two Pelton turbines at the Outback Site											
Present Worth Analysis Worksheet - Conceptual and Comparative											
Total 50-year Present Worth											
Present Worth of Revenues	\$65,602,289										
Present Worth of Costs	\$43,013,174										
Gain / (Loss)	\$22,589,115										
Capital Costs											
Turbine and Powerhouse Construction Cost	\$ 41,827,000										
	\$ 9,020,000										
Operation and Maintenance Costs											
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 52,761										
Period Number	0	41	42	43	44	45	46	47	48	49	50
Year	2013	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues											
Electrical Sales Revenue											
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	9,260	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790	11,790
Total Electricity Sales Revenues	\$ 1,009,340	\$5,883,210	\$6,225,120	\$6,567,030	\$6,956,100	\$7,345,170	\$7,769,610	\$8,205,840	\$8,677,440	\$9,172,620	\$9,691,380
Tax Credits, Grants, Incentives											
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000										
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000										
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000										
Energy Trust of Oregon (10% Capital Cost)2	\$ 4,182,700										
Total Revenue	\$ 7,992,040	\$5,883,210	\$6,225,120	\$6,567,030	\$6,956,100	\$7,345,170	\$7,769,610	\$8,205,840	\$8,677,440	\$9,172,620	\$9,691,380
Total Costs											
Capital Cost Expenditures	\$41,827,000										
O&M Expenditures	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Total Cost	\$41,879,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Present Worth Analysis											
Present Worth Factor	1.0000	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 7,992,040	\$1,178,277	\$1,198,802	\$1,216,005	\$1,238,508	\$1,257,481	\$1,278,985	\$1,298,841	\$1,320,661	\$1,342,331	\$1,363,699
Present Worth Capital Cost Expenditures	\$41,827,000										
Present Worth O&M Expenditures	\$ 52,761	\$ 10,567	\$ 10,160	\$ 9,770	\$ 9,394	\$ 9,033	\$ 8,685	\$ 8,351	\$ 8,030	\$ 7,721	\$ 7,424
Present Worth Total Cost	\$41,879,761	\$ 10,567	\$ 10,160	\$ 9,770	\$ 9,394	\$ 9,033	\$ 8,685	\$ 8,351	\$ 8,030	\$ 7,721	\$ 7,424
Payback Period											
	no	41	42	43	44	45	46	47	48	49	50
Notes:											
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009											
2. Values based on Jim Doanes email 6-10-2010											

Outback Alternative 1																				
Scenario III																				
Two Pelton turbines at the Outback Site																				
Present Worth Analysis Worksheet - Conceptual and Comparative																				
Total 50-year Present Worth																				
	Total	Outback	ASR																	
Present Worth of Revenues	\$79,700,487	\$70,032,930	\$9,667,557																	
Present Worth of Costs	\$54,087,395	\$43,013,174	\$11,074,221																	
Gain / (Loss)	\$25,613,091	\$27,019,756	(\$1,406,665)																	
Capital Costs																				
Turbine and Powerhouse Construction Cost	\$41,827,000																			
	\$ 9,020,000																			
Operation and Maintenance Costs																				
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 52,761																			
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total Revenues																				
Electrical Sales Revenue																				
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148
Annual Energy Production (MWh)	11,820	11,820	11,820	11,820	11,820	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390
Total Electricity Sales Revenues	\$ 1,288,380	\$ 1,312,020	\$ 1,347,480	\$ 1,394,760	\$ 1,430,220	\$ 1,536,360	\$ 1,573,530	\$ 1,623,090	\$ 1,660,260	\$ 1,672,650	\$ 1,214,220	\$ 1,226,610	\$ 1,239,000	\$ 1,313,340	\$ 1,387,680	\$ 1,462,020	\$ 1,548,750	\$ 1,635,480	\$ 1,722,210	\$ 1,833,720
Tax Credits, Grants, Incentives																				
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000															
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000																			
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000																			
Energy Trust of Oregon (10% Capital Cost)2	\$ 4,182,700																			
Total Revenue	\$ 8,271,080	\$ 3,312,020	\$ 3,347,480	\$ 3,394,760	\$ 3,430,220	\$ 1,536,360	\$ 1,573,530	\$ 1,623,090	\$ 1,660,260	\$ 1,672,650	\$ 1,214,220	\$ 1,226,610	\$ 1,239,000	\$ 1,313,340	\$ 1,387,680	\$ 1,462,020	\$ 1,548,750	\$ 1,635,480	\$ 1,722,210	\$ 1,833,720
Total Costs																				
Capital Cost Expenditures	\$41,827,000																			
O&M Expenditures	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Total Cost	\$41,879,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Present Worth Analysis																				
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746
Present Worth Total Revenues	\$ 8,271,080	\$ 3,184,635	\$ 3,094,933	\$ 3,017,929	\$ 2,932,166	\$ 1,262,776	\$ 1,243,584	\$ 1,233,415	\$ 1,213,136	\$ 1,175,182	\$ 820,284	\$ 796,782	\$ 773,876	\$ 788,758	\$ 801,351	\$ 811,808	\$ 826,890	\$ 839,612	\$ 850,131	\$ 870,361
Present Worth Capital Cost Expenditures	\$41,827,000																			
Present Worth O&M Expenditures	\$ 52,761	\$ 50,731	\$ 48,780	\$ 46,904	\$ 45,100	\$ 43,365	\$ 41,697	\$ 40,094	\$ 38,552	\$ 37,069	\$ 35,643	\$ 34,272	\$ 32,954	\$ 31,687	\$ 30,468	\$ 29,296	\$ 28,169	\$ 27,086	\$ 26,044	\$ 25,042
Present Worth Total Cost	\$41,879,761	\$ 50,731	\$ 48,780	\$ 46,904	\$ 45,100	\$ 43,365	\$ 41,697	\$ 40,094	\$ 38,552	\$ 37,069	\$ 35,643	\$ 34,272	\$ 32,954	\$ 31,687	\$ 30,468	\$ 29,296	\$ 28,169	\$ 27,086	\$ 26,044	\$ 25,042
Outback Payback Period																				
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Outback and ASR Hydrogeneration Facilities Payback Period																				
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																				
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																				
2. Values based on Jim Doanes email 6-10-2010																				

Outback Alternative 1																					
Scenario III																					
Two Pelton turbines at the Outback Site																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$79,700,487																				
Present Worth of Costs	\$54,087,395																				
Gain / (Loss)	\$25,613,091																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$ 41,827,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 52,761																				
Period Number	0	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Year	2013	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.156	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447
Annual Energy Production (MWh)	11,820	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390	12,390
Total Electricity Sales Revenues	\$ 1,288,380	\$1,932,840	\$2,044,350	\$2,155,860	\$2,279,760	\$2,416,050	\$2,552,340	\$2,688,630	\$2,849,700	\$3,010,770	\$3,184,230	\$3,370,080	\$3,555,930	\$3,754,170	\$3,964,800	\$4,200,210	\$4,435,620	\$4,695,810	\$4,956,000	\$5,240,970	\$5,538,330
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 4,182,700																				
Total Revenue	\$ 8,271,080	\$1,932,840	\$2,044,350	\$2,155,860	\$2,279,760	\$2,416,050	\$2,552,340	\$2,688,630	\$2,849,700	\$3,010,770	\$3,184,230	\$3,370,080	\$3,555,930	\$3,754,170	\$3,964,800	\$4,200,210	\$4,435,620	\$4,695,810	\$4,956,000	\$5,240,970	\$5,538,330
Total Costs																					
Capital Cost Expenditures	\$41,827,000																				
O&M Expenditures	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Total Cost	\$41,879,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761	\$ 52,761
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4564	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166
Present Worth Total Revenues	\$ 8,271,080	\$ 882,123	\$ 897,129	\$ 909,677	\$ 924,959	\$ 942,553	\$ 957,426	\$ 969,760	\$ 988,323	\$1,004,024	\$1,021,028	\$1,039,059	\$1,054,192	\$1,070,156	\$1,086,729	\$1,106,974	\$1,124,055	\$1,144,222	\$1,161,175	\$1,180,714	\$1,199,716
Present Worth Capital Cost Expenditures	\$41,827,000																				
Present Worth O&M Expenditures	\$ 52,761	\$ 24,079	\$ 23,153	\$ 22,263	\$ 21,406	\$ 20,583	\$ 19,791	\$ 19,030	\$ 18,298	\$ 17,594	\$ 16,918	\$ 16,267	\$ 15,641	\$ 15,040	\$ 14,461	\$ 13,905	\$ 13,370	\$ 12,856	\$ 12,362	\$ 11,886	\$ 11,429
Present Worth Total Cost	\$41,879,761	\$ 24,079	\$ 23,153	\$ 22,263	\$ 21,406	\$ 20,583	\$ 19,791	\$ 19,030	\$ 18,298	\$ 17,594	\$ 16,918	\$ 16,267	\$ 15,641	\$ 15,040	\$ 14,461	\$ 13,905	\$ 13,370	\$ 12,856	\$ 12,362	\$ 11,886	\$ 11,429
Outback Payback Period																					
	no	no	no	no	no	no	no	no	no	28	29	30	31	32	33	34	35	36	37	38	39
Outback and ASR Hydrogeneration Facilities Payback Period																					
	no	no	no	no	no	no	no	no	no	no	29	30	31	32	33	34	35	36	37	38	39
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Present worth Analysis for Outback Alternative 2 Scenarios I, II and III

Outback Alternative 2																					
Scenario I																					
One Pelton turbines at the Outback Site																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth		Total	Outback	ASR																	
Present Worth of Revenues		\$75,312,768	\$65,645,211	\$9,667,557																	
Present Worth of Costs		\$48,899,960	\$37,825,739	\$11,074,221																	
Gain / (Loss)		\$26,412,808	\$27,819,472	(\$1,406,665)																	
Capital Costs		\$37,035,000																			
Turbine and Powerhouse Construction Cost		\$ 6,013,000																			
Operation and Maintenance Costs		\$ 35,172																			
O&M Costs (Start year, @ 0.05% of Construction Cost)		\$ 35,172																			
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}		0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148
Annual Energy Production (MWh)		11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460	11,460
Total Electricity Sales Revenues		\$ 1,249,140	\$ 1,272,060	\$ 1,306,440	\$1,352,280	\$1,386,660	\$1,421,040	\$1,455,420	\$1,501,260	\$1,535,640	\$1,547,100	\$1,123,080	\$1,134,540	\$1,146,000	\$1,214,760	\$1,283,520	\$1,352,280	\$1,432,500	\$1,512,720	\$1,592,940	\$1,696,080
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)		\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$2,000,000	\$2,000,000															
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2		\$ 400,000																			
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2		\$ 400,000																			
Energy Trust of Oregon (10% Capital Cost)2		\$ 3,703,500																			
Total Revenue		\$ 7,752,640	\$ 3,272,060	\$ 3,306,440	\$3,352,280	\$3,386,660	\$1,421,040	\$1,455,420	\$1,501,260	\$1,535,640	\$1,547,100	\$1,123,080	\$1,134,540	\$1,146,000	\$1,214,760	\$1,283,520	\$1,352,280	\$1,432,500	\$1,512,720	\$1,592,940	\$1,696,080
Total Costs																					
Capital Cost Expenditures		\$37,035,000																			
O&M Expenditures		\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Total Cost		\$37,070,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Present Worth Analysis																					
Present Worth Factor		1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746
Present Worth Total Revenues		\$ 7,752,640	\$ 3,146,212	\$ 3,056,990	\$2,980,165	\$2,894,931	\$1,167,991	\$1,150,240	\$1,140,834	\$1,122,077	\$1,086,972	\$ 758,713	\$ 736,976	\$ 715,788	\$ 729,553	\$ 741,201	\$ 750,873	\$ 764,823	\$ 776,590	\$ 786,320	\$ 805,032
Present Worth Capital Cost Expenditures		\$37,035,000																			
Present Worth O&M Expenditures		\$ 35,172	\$ 33,819	\$ 32,518	\$ 31,268	\$ 30,065	\$ 28,909	\$ 27,797	\$ 26,728	\$ 25,700	\$ 24,711	\$ 23,761	\$ 22,847	\$ 21,968	\$ 21,123	\$ 20,311	\$ 19,530	\$ 18,779	\$ 18,056	\$ 17,362	\$ 16,694
Present Worth Total Cost		\$37,070,172	\$ 33,819	\$ 32,518	\$ 31,268	\$ 30,065	\$ 28,909	\$ 27,797	\$ 26,728	\$ 25,700	\$ 24,711	\$ 23,761	\$ 22,847	\$ 21,968	\$ 21,123	\$ 20,311	\$ 19,530	\$ 18,779	\$ 18,056	\$ 17,362	\$ 16,694
Outback Payback Period																					
		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Outback and ASR Hydrogeneration Facilities Payback Period																					
		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Outback Alternative 2																					
Scenario I																					
One Pelton turbines at the Outback Site																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth		Total																			
Present Worth of Revenues		\$75,312,768																			
Present Worth of Costs		\$48,899,960																			
Gain / (Loss)		\$26,412,808																			
Capital Costs		\$37,035,000																			
Turbine and Powerhouse Construction Cost		\$ 6,013,000																			
Operation and Maintenance Costs		\$ 35,172																			
O&M Costs (Start year, @ 0.05% of Construction Cost)																					
Period Number	0	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Year	2013	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}		0.109																			
Annual Energy Production (MWh)		11,460																			
Total Electricity Sales Revenues		\$ 1,249,140																			
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)		\$ 2,000,000																			
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2		\$ 400,000																			
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2		\$ 400,000																			
Energy Trust of Oregon (10% Capital Cost)2		\$ 3,703,500																			
Total Revenue		\$ 7,752,640																			
Total Costs																					
Capital Cost Expenditures		\$37,035,000																			
O&M Expenditures		\$ 35,172																			
Total Cost		\$37,070,172																			
Present Worth Analysis																					
Present Worth Factor		1.0000																			
Present Worth Total Revenues		\$ 7,752,640																			
Present Worth Capital Cost Expenditures		\$37,035,000																			
Present Worth O&M Expenditures		\$ 35,172																			
Present Worth Total Cost		\$37,070,172																			
Outback Payback Period																					
no		no																			
Outback and ASR Hydrogeneration Facilities Payback Period																					
no		no																			
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Outback Alternative 2																					
Scenario II																					
One Pelton turbines at the Outback Site																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$63,608,444																				
Present Worth of Costs	\$37,825,739																				
Gain / (Loss)	\$25,782,705																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$ 37,035,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 35,172																				
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148	0.156
Annual Energy Production (MWh)	8,990	9,172	9,355	9,536	9,718	9,899	10,080	10,227	10,367	10,506	10,646	10,785	10,924	11,063	11,201	10,367	11,397	11,442	11,443	11,443	11,443
Total Electricity Sales Revenues	\$ 979,904	\$1,018,138	\$1,066,419	\$1,125,290	\$1,175,854	\$1,227,462	\$1,280,108	\$1,339,673	\$1,389,126	\$1,418,370	\$1,043,309	\$1,067,744	\$1,092,430	\$1,172,679	\$1,254,559	\$1,223,260	\$1,424,624	\$1,510,332	\$1,590,529	\$1,693,513	\$1,785,055
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000																
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 3,703,500																				
Total Revenue	\$ 7,483,404	\$3,018,138	\$3,066,419	\$3,125,290	\$3,175,854	\$1,227,462	\$1,280,108	\$1,339,673	\$1,389,126	\$1,418,370	\$1,043,309	\$1,067,744	\$1,092,430	\$1,172,679	\$1,254,559	\$1,223,260	\$1,424,624	\$1,510,332	\$1,590,529	\$1,693,513	\$1,785,055
Total Costs																					
Capital Cost Expenditures	\$37,035,000																				
O&M Expenditures	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	
Total Cost	\$37,070,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	
Present Worth Analysis																					
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746	0.4564
Present Worth Total Revenues	\$ 7,483,404	\$2,902,056	\$2,835,077	\$2,778,371	\$2,714,733	\$1,008,884	\$1,011,688	\$1,018,042	\$1,015,020	\$ 996,528	\$ 704,822	\$ 693,586	\$ 682,328	\$ 704,280	\$ 724,477	\$ 679,233	\$ 760,618	\$ 775,364	\$ 785,130	\$ 803,813	\$ 814,676
Present Worth Capital Cost Expenditures	\$37,035,000																				
Present Worth O&M Expenditures	\$ 35,172	\$ 33,819	\$ 32,518	\$ 31,268	\$ 30,065	\$ 28,909	\$ 27,797	\$ 26,728	\$ 25,700	\$ 24,711	\$ 23,761	\$ 22,847	\$ 21,968	\$ 21,123	\$ 20,311	\$ 19,530	\$ 18,779	\$ 18,056	\$ 17,362	\$ 16,694	\$ 16,052
Present Worth Total Cost	\$37,070,172	\$ 33,819	\$ 32,518	\$ 31,268	\$ 30,065	\$ 28,909	\$ 27,797	\$ 26,728	\$ 25,700	\$ 24,711	\$ 23,761	\$ 22,847	\$ 21,968	\$ 21,123	\$ 20,311	\$ 19,530	\$ 18,779	\$ 18,056	\$ 17,362	\$ 16,694	\$ 16,052
Payback Period																					
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Outback Alternative 2																					
Scenario II																					
One Pelton turbines at the Outback Site																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$63,608,444																				
Present Worth of Costs	\$37,825,739																				
Gain / (Loss)	\$25,782,705																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$ 6,013,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 35,172																				
Period Number	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Year	2013	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447	0.473
Annual Energy Production (MWh)	8,990	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443
Total Electricity Sales Revenues	\$ 979,904	\$1,888,039	\$1,991,022	\$2,105,449	\$2,231,318	\$2,357,187	\$2,483,057	\$2,631,811	\$2,780,566	\$2,940,763	\$3,112,403	\$3,284,043	\$3,467,125	\$3,661,650	\$3,879,061	\$4,096,471	\$4,336,767	\$4,577,063	\$4,840,244	\$5,114,868	\$5,412,377
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 3,703,500																				
Total Revenue	\$ 7,483,404	\$1,888,039	\$1,991,022	\$2,105,449	\$2,231,318	\$2,357,187	\$2,483,057	\$2,631,811	\$2,780,566	\$2,940,763	\$3,112,403	\$3,284,043	\$3,467,125	\$3,661,650	\$3,879,061	\$4,096,471	\$4,336,767	\$4,577,063	\$4,840,244	\$5,114,868	\$5,412,377
Total Costs																					
Capital Cost Expenditures	\$37,035,000																				
O&M Expenditures	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	
Total Cost	\$37,070,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166	0.2083
Present Worth Total Revenues	\$ 7,483,404	\$ 828,535	\$ 840,123	\$ 854,236	\$ 870,485	\$ 884,221	\$ 895,612	\$ 912,756	\$ 927,256	\$ 942,960	\$ 959,612	\$ 973,588	\$ 988,332	\$1,003,637	\$1,022,335	\$1,038,109	\$1,056,735	\$1,072,391	\$1,090,437	\$1,107,986	\$1,127,339
Present Worth Capital Cost Expenditures	\$37,035,000																				
Present Worth O&M Expenditures	\$ 35,172	\$ 15,435	\$ 14,841	\$ 14,270	\$ 13,721	\$ 13,194	\$ 12,686	\$ 12,198	\$ 11,729	\$ 11,278	\$ 10,844	\$ 10,427	\$ 10,026	\$ 9,640	\$ 9,270	\$ 8,913	\$ 8,570	\$ 8,241	\$ 7,924	\$ 7,619	\$ 7,326
Present Worth Total Cost	\$37,070,172	\$ 15,435	\$ 14,841	\$ 14,270	\$ 13,721	\$ 13,194	\$ 12,686	\$ 12,198	\$ 11,729	\$ 11,278	\$ 10,844	\$ 10,427	\$ 10,026	\$ 9,640	\$ 9,270	\$ 8,913	\$ 8,570	\$ 8,241	\$ 7,924	\$ 7,619	\$ 7,326
Payback Period																					
	no	no	no	no	no	no	no	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Outback Alternative 2											
Scenario II											
One Pelton turbines at the Outback Site											
Present Worth Analysis Worksheet - Conceptual and Comparative											
Total 50-year Present Worth											
Present Worth of Revenues	\$63,608,444										
Present Worth of Costs	\$37,825,739										
Gain / (Loss)	\$25,782,705										
Capital Costs											
Turbine and Powerhouse Construction Cost	\$ 6,013,000										
Operation and Maintenance Costs											
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 35,172										
Period Number	0	41	42	43	44	45	46	47	48	49	50
Year	2013	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues											
Electrical Sales Revenue											
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	8,990	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443	11,443
Total Electricity Sales Revenues	\$ 979,904	\$5,709,886	\$6,041,723	\$6,373,560	\$6,751,168	\$7,128,776	\$7,540,711	\$7,964,090	\$8,421,796	\$8,902,388	\$9,405,865
Tax Credits, Grants, Incentives											
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000										
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000										
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000										
Energy Trust of Oregon (10% Capital Cost)2	\$ 3,703,500										
Total Revenue	\$ 7,483,404	\$5,709,886	\$6,041,723	\$6,373,560	\$6,751,168	\$7,128,776	\$7,540,711	\$7,964,090	\$8,421,796	\$8,902,388	\$9,405,865
Total Costs											
Capital Cost Expenditures	\$37,035,000										
O&M Expenditures	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Total Cost	\$37,070,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Present Worth Analysis											
Present Worth Factor	1.0000	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 7,483,404	\$1,143,564	\$1,163,484	\$1,180,181	\$1,202,021	\$1,220,435	\$1,241,306	\$1,260,576	\$1,281,753	\$1,302,785	\$1,323,524
Present Worth Capital Cost Expenditures	\$37,035,000										
Present Worth O&M Expenditures	\$ 35,172	\$ 7,044	\$ 6,773	\$ 6,513	\$ 6,262	\$ 6,021	\$ 5,790	\$ 5,567	\$ 5,353	\$ 5,147	\$ 4,949
Present Worth Total Cost	\$37,070,172	\$ 7,044	\$ 6,773	\$ 6,513	\$ 6,262	\$ 6,021	\$ 5,790	\$ 5,567	\$ 5,353	\$ 5,147	\$ 4,949
Payback Period											
	no	41	42	43	44	45	46	47	48	49	50
Notes:											
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009											
2. Values based on Jim Doanes email 6-10-2010											

Outback Alternative 2																				
Scenario III																				
One Pelton turbines at the Outback Site																				
Present Worth Analysis Worksheet - Conceptual and Comparative																				
Total 50-year Present Worth																				
	Total	Outback	ASR																	
Present Worth of Revenues	\$77,551,511	\$67,883,954	\$9,667,557																	
Present Worth of Costs	\$48,899,960	\$37,825,739	\$11,074,221																	
Gain / (Loss)	\$28,651,551	\$30,058,215	(\$1,406,665)																	
Capital Costs																				
Turbine and Powerhouse Construction Cost	\$37,035,000																			
	\$ 6,013,000																			
Operation and Maintenance Costs																				
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 35,172																			
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total Revenues																				
Electrical Sales Revenue																				
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148
Annual Energy Production (MWh)	11,460	11,460	11,460	11,460	11,460	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020
Total Electricity Sales Revenues	\$ 1,249,140	\$ 1,272,060	\$ 1,306,440	\$1,352,280	\$1,386,660	\$1,490,480	\$1,526,540	\$1,574,620	\$1,610,680	\$1,622,700	\$1,177,960	\$1,189,980	\$1,202,000	\$1,274,120	\$1,346,240	\$1,418,360	\$1,502,500	\$1,586,640	\$1,670,780	\$1,778,960
Tax Credits, Grants, Incentives																				
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$2,000,000	\$2,000,000															
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000																			
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000																			
Energy Trust of Oregon (10% Capital Cost)2	\$ 3,703,500																			
Total Revenue	\$ 7,752,640	\$ 3,272,060	\$ 3,306,440	\$3,352,280	\$3,386,660	\$1,490,480	\$1,526,540	\$1,574,620	\$1,610,680	\$1,622,700	\$1,177,960	\$1,189,980	\$1,202,000	\$1,274,120	\$1,346,240	\$1,418,360	\$1,502,500	\$1,586,640	\$1,670,780	\$1,778,960
Total Costs																				
Capital Cost Expenditures	\$37,035,000																			
O&M Expenditures	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Total Cost	\$37,070,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Present Worth Analysis																				
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746
Present Worth Total Revenues	\$ 7,752,640	\$ 3,146,212	\$ 3,056,990	\$2,980,165	\$2,894,931	\$1,225,066	\$1,206,447	\$1,196,582	\$1,176,908	\$1,140,087	\$ 795,788	\$ 772,988	\$ 750,766	\$ 765,203	\$ 777,420	\$ 787,565	\$ 802,197	\$ 814,539	\$ 824,744	\$ 844,370
Present Worth Capital Cost Expenditures	\$37,035,000																			
Present Worth O&M Expenditures	\$ 35,172	\$ 33,819	\$ 32,518	\$ 31,268	\$ 30,065	\$ 28,909	\$ 27,797	\$ 26,728	\$ 25,700	\$ 24,711	\$ 23,761	\$ 22,847	\$ 21,968	\$ 21,123	\$ 20,311	\$ 19,530	\$ 18,779	\$ 18,056	\$ 17,362	\$ 16,694
Present Worth Total Cost	\$37,070,172	\$ 33,819	\$ 32,518	\$ 31,268	\$ 30,065	\$ 28,909	\$ 27,797	\$ 26,728	\$ 25,700	\$ 24,711	\$ 23,761	\$ 22,847	\$ 21,968	\$ 21,123	\$ 20,311	\$ 19,530	\$ 18,779	\$ 18,056	\$ 17,362	\$ 16,694
Outback Payback Period																				
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Outback and ASR Hydrogeneration Facilities Payback Period																				
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																				
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																				
2. Values based on Jim Doanes email 6-10-2010																				

Outback Alternative 2																					
Scenario III																					
One Pelton turbines at the Outback Site																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$77,551,511																				
Present Worth of Costs	\$48,899,960																				
Gain / (Loss)	\$28,651,551																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$ 6,013,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 35,172																				
Period Number	0	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Year	2013	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.156	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447
Annual Energy Production (MWh)	11,460	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020
Total Electricity Sales Revenues	\$ 1,249,140	\$1,875,120	\$1,983,300	\$2,091,480	\$2,211,680	\$2,343,900	\$2,476,120	\$2,608,340	\$2,764,600	\$2,920,860	\$3,089,140	\$3,269,440	\$3,449,740	\$3,642,060	\$3,846,400	\$4,074,780	\$4,303,160	\$4,555,580	\$4,808,000	\$5,084,460	\$5,372,940
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 3,703,500																				
Total Revenue	\$ 7,752,640	\$1,875,120	\$1,983,300	\$2,091,480	\$2,211,680	\$2,343,900	\$2,476,120	\$2,608,340	\$2,764,600	\$2,920,860	\$3,089,140	\$3,269,440	\$3,449,740	\$3,642,060	\$3,846,400	\$4,074,780	\$4,303,160	\$4,555,580	\$4,808,000	\$5,084,460	\$5,372,940
Total Costs																					
Capital Cost Expenditures	\$37,035,000																				
O&M Expenditures	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Total Cost	\$37,070,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4564	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166
Present Worth Total Revenues	\$ 7,752,640	\$ 855,780	\$ 870,339	\$ 882,511	\$ 897,337	\$ 914,406	\$ 928,834	\$ 940,800	\$ 958,809	\$ 974,041	\$ 990,537	\$1,008,029	\$1,022,711	\$1,038,198	\$1,054,276	\$1,073,917	\$1,090,487	\$1,110,052	\$1,126,499	\$1,145,455	\$1,163,890
Present Worth Capital Cost Expenditures	\$37,035,000																				
Present Worth O&M Expenditures	\$ 35,172	\$ 16,052	\$ 15,435	\$ 14,841	\$ 14,270	\$ 13,721	\$ 13,194	\$ 12,686	\$ 12,198	\$ 11,729	\$ 11,278	\$ 10,844	\$ 10,427	\$ 10,026	\$ 9,640	\$ 9,270	\$ 8,913	\$ 8,570	\$ 8,241	\$ 7,924	\$ 7,619
Present Worth Total Cost	\$37,070,172	\$ 16,052	\$ 15,435	\$ 14,841	\$ 14,270	\$ 13,721	\$ 13,194	\$ 12,686	\$ 12,198	\$ 11,729	\$ 11,278	\$ 10,844	\$ 10,427	\$ 10,026	\$ 9,640	\$ 9,270	\$ 8,913	\$ 8,570	\$ 8,241	\$ 7,924	\$ 7,619
Outback Payback Period																					
	no	no	no	no	no	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Outback and ASR Hydrogeneration Facilities Payback Period																					
	no	no	no	no	no	no	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Outback Alternative 2												
Scenario III												
One Pelton turbines at the Outback Site												
Present Worth Analysis Worksheet - Conceptual and Comparative												
Total 50-year Present Worth												
Present Worth of Revenues	\$77,551,511											
Present Worth of Costs	\$48,899,960											
Gain / (Loss)	\$28,651,551											
Capital Costs												
Turbine and Powerhouse Construction Cost	\$ 6,013,000											
Operation and Maintenance Costs												
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 35,172											
Period Number	0	40	41	42	43	44	45	46	47	48	49	50
Year	2013	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues												
Electrical Sales Revenue												
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.473	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	11,460	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020	12,020
Total Electricity Sales Revenues	\$ 1,249,140	\$5,685,460	\$5,997,980	\$6,346,560	\$6,695,140	\$7,091,800	\$7,488,460	\$7,921,180	\$8,365,920	\$8,846,720	\$9,351,560	\$9,880,440
Tax Credits, Grants, Incentives												
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 2,000,000											
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 400,000											
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 400,000											
Energy Trust of Oregon (10% Capital Cost)2	\$ 3,703,500											
Total Revenue	\$ 7,752,640	\$5,685,460	\$5,997,980	\$6,346,560	\$6,695,140	\$7,091,800	\$7,488,460	\$7,921,180	\$8,365,920	\$8,846,720	\$9,351,560	\$9,880,440
Total Costs												
Capital Cost Expenditures	\$37,035,000											
O&M Expenditures	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Total Cost	\$37,070,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172	\$ 35,172
Present Worth Analysis												
Present Worth Factor	1.0000	0.2083	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 7,752,640	\$1,184,219	\$1,201,263	\$1,222,188	\$1,239,727	\$1,262,669	\$1,282,012	\$1,303,936	\$1,324,179	\$1,346,424	\$1,368,518	\$1,390,303
Present Worth Capital Cost Expenditures	\$37,035,000											
Present Worth O&M Expenditures	\$ 35,172	\$ 7,326	\$ 7,044	\$ 6,773	\$ 6,513	\$ 6,262	\$ 6,021	\$ 5,790	\$ 5,567	\$ 5,353	\$ 5,147	\$ 4,949
Present Worth Total Cost	\$37,070,172	\$ 7,326	\$ 7,044	\$ 6,773	\$ 6,513	\$ 6,262	\$ 6,021	\$ 5,790	\$ 5,567	\$ 5,353	\$ 5,147	\$ 4,949
Outback Payback Period												
	no	40	41	42	43	44	45	46	47	48	49	50
Outback and ASR Hydrogeneration Facilities Payback Period												
	no	40	41	42	43	44	45	46	47	48	49	50
Notes:												
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009												
2. Values based on Jim Doanes email 6-10-2010												

Present Worth Analysis for ASR Injection Wells Scenarios I, II and III

ASR Injection Wells Hydrogeneration Facility																					
Scenarios I & III																					
Vertical Submersible Turbine at ASR Wells																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$9,667,557																				
Present Worth of Costs	\$11,074,221																				
Gain / (Loss)	(\$1,406,665)																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$ 10,299,000																				
	\$ 5,895,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 34,482																				
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148	0.156
Annual Energy Production (MWh)	941	866	791	734	664	596	520	466	413	353	301	249	195	140	86	51	18	0	0	0	0
Total Electricity Sales Revenues	\$ 102,569	\$ 96,106	\$ 90,201	\$ 86,606	\$ 80,359	\$ 73,957	\$ 66,096	\$ 61,041	\$ 55,330	\$ 47,610	\$ 29,467	\$ 24,621	\$ 19,530	\$ 14,881	\$ 9,602	\$ 5,965	\$ 2,222	\$ -	\$ -	\$ -	\$ -
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 1,029,900	\$ 1,029,900	\$ 1,029,900	\$ 1,029,900	\$ 1,029,900																
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 55,200																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 3,089,700																				
Energy Trust of Oregon (10% Capital Cost) ²	\$ 1,029,900																				
Total Revenue	\$ 5,307,269	\$ 1,126,006	\$ 1,120,101	\$ 1,116,506	\$ 1,110,259	\$ 73,957	\$ 66,096	\$ 61,041	\$ 55,330	\$ 47,610	\$ 29,467	\$ 24,621	\$ 19,530	\$ 14,881	\$ 9,602	\$ 5,965	\$ 2,222	\$ -	\$ -	\$ -	\$ -
Total Costs																					
Capital Cost Expenditures	\$ 10,299,000																				
O&M Expenditures	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482
Total Cost	\$ 10,333,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482
Present Worth Analysis																					
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746	0.4564
Present Worth Total Revenues	\$ 5,307,269	\$ 1,082,698	\$ 1,035,597	\$ 992,570	\$ 949,054	\$ 60,787	\$ 52,237	\$ 46,386	\$ 40,429	\$ 33,450	\$ 19,907	\$ 15,993	\$ 12,198	\$ 8,937	\$ 5,545	\$ 3,312	\$ 1,186	\$ -	\$ -	\$ -	\$ -
Present Worth Capital Cost Expenditures	\$ 10,299,000																				
Present Worth O&M Expenditures	\$ 34,482	\$ 33,155	\$ 31,880	\$ 30,654	\$ 29,475	\$ 28,341	\$ 27,251	\$ 26,203	\$ 25,195	\$ 24,226	\$ 23,295	\$ 22,399	\$ 21,537	\$ 20,709	\$ 19,912	\$ 19,146	\$ 18,410	\$ 17,702	\$ 17,021	\$ 16,366	\$ 15,737
Present Worth Total Cost	\$ 10,333,482	\$ 33,155	\$ 31,880	\$ 30,654	\$ 29,475	\$ 28,341	\$ 27,251	\$ 26,203	\$ 25,195	\$ 24,226	\$ 23,295	\$ 22,399	\$ 21,537	\$ 20,709	\$ 19,912	\$ 19,146	\$ 18,410	\$ 17,702	\$ 17,021	\$ 16,366	\$ 15,737
Payback Period																					
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

This spreadsheet is to provide some detailed information on the ASR costs, revenues only. The present worth analysis is included in the Outback Hydrogeneration Facility Alternative 1 and 2 for Scenarios I and III. This is not a stand alone present worth analysis.

ASR Injection Wells Hydrogeneration Facility																					
Scenarios I & III																					
Vertical Submersible Turbine at ASR Wells																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$9,667,557																				
Present Worth of Costs	\$11,074,221																				
Gain / (Loss)	(\$1,406,665)																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$ 10,299,000																				
	\$ 5,895,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 34,482																				
Period Number	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Year	2013	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447	0.473
Annual Energy Production (MWh)	941	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Electricity Sales Revenues	\$ 102,569	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 1,029,900																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 55,200																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 3,089,700																				
Energy Trust of Oregon (10% Capital Cost) ²	\$ 1,029,900																				
Total Revenue	\$ 5,307,269	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Costs																					
Capital Cost Expenditures	\$10,299,000																				
O&M Expenditures	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482
Total Cost	\$10,333,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166	0.2083
Present Worth Total Revenues	\$ 5,307,269	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Present Worth Capital Cost Expenditures	\$10,299,000																				
Present Worth O&M Expenditures	\$ 34,482	\$ 15,132	\$ 14,550	\$ 13,990	\$ 13,452	\$ 12,935	\$ 12,437	\$ 11,959	\$ 11,499	\$ 11,057	\$ 10,631	\$ 10,222	\$ 9,829	\$ 9,451	\$ 9,088	\$ 8,738	\$ 8,402	\$ 8,079	\$ 7,768	\$ 7,469	\$ 7,182
Present Worth Total Cost	\$10,333,482	\$ 15,132	\$ 14,550	\$ 13,990	\$ 13,452	\$ 12,935	\$ 12,437	\$ 11,959	\$ 11,499	\$ 11,057	\$ 10,631	\$ 10,222	\$ 9,829	\$ 9,451	\$ 9,088	\$ 8,738	\$ 8,402	\$ 8,079	\$ 7,768	\$ 7,469	\$ 7,182
Payback Period																					
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

This spreadsheet is to provide some detailed information on the ASR costs, revenues only. The present worth analysis is included in the Outback Hydrogeneration Facility Alternative 1 and 2 for Scenarios I and III. This is not a stand alone present worth analysis.

ASR Injection Wells Hydrogeneration Facility											
Scenarios I & III											
Vertical Submersible Turbine at ASR Wells											
Present Worth Analysis Worksheet - Conceptual and Comparative											
Total 50-year Present Worth											
Present Worth of Revenues	\$9,667,557										
Present Worth of Costs	\$11,074,221										
Gain / (Loss)	(\$1,406,665)										
Capital Costs											
Turbine and Powerhouse Construction Cost	\$ 10,299,000										
	\$ 5,895,000										
Operation and Maintenance Costs											
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$ 34,482										
Period Number	0	41	42	43	44	45	46	47	48	49	50
Year	2013	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues											
Electrical Sales Revenue											
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	941	0	0	0	0	0	0	0	0	0	0
Total Electricity Sales Revenues	\$ 102,569	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Tax Credits, Grants, Incentives											
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 1,029,900										
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 55,200										
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 3,089,700										
Energy Trust of Oregon (10% Capital Cost) ²	\$ 1,029,900										
Total Revenue	\$ 5,307,269	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Costs											
Capital Cost Expenditures	\$10,299,000										
O&M Expenditures	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482
Total Cost	\$10,333,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482	\$ 34,482
Present Worth Analysis											
Present Worth Factor	1.0000	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 5,307,269	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Present Worth Capital Cost Expenditures	\$10,299,000										
Present Worth O&M Expenditures	\$ 34,482	\$ 6,906	\$ 6,640	\$ 6,385	\$ 6,139	\$ 5,903	\$ 5,676	\$ 5,458	\$ 5,248	\$ 5,046	\$ 4,852
Present Worth Total Cost	\$10,333,482	\$ 6,906	\$ 6,640	\$ 6,385	\$ 6,139	\$ 5,903	\$ 5,676	\$ 5,458	\$ 5,248	\$ 5,046	\$ 4,852
Payback Period											
	no	no	no	no	no	no	no	no	no	no	no
Notes:											
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009											
2. Values based on Jim Doanes email 6-10-2010											

This spreadsheet is to provide some detailed information on the ASR costs, revenues only. The present worth analysis is included in the Outback Hydrogeneration Facility Alternative 1 and 2 for Scenarios I and III. This is not a stand alone present worth analysis.

Present Worth Analysis for Distribution

Distribution Overturf																					
Pump-Turbines at Distribution System PRVs																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$768,668																				
Present Worth of Costs	\$968,541																				
Gain / (Loss)	(\$199,873)																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$902,000																				
	\$506,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$2,960																				
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148	0.156
Annual Energy Production (MWh)	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
Total Electricity Sales Revenues	\$ 6,213	\$ 6,327	\$ 6,498	\$ 6,726	\$ 6,897	\$ 7,068	\$ 7,239	\$ 7,467	\$ 7,638	\$ 7,695	\$ 5,586	\$ 5,643	\$ 5,700	\$ 6,042	\$ 6,384	\$ 6,726	\$ 7,125	\$ 7,524	\$ 7,923	\$ 8,436	\$ 8,892
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 90,200	\$ 90,200	\$ 90,200	\$ 90,200	\$ 90,200																
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 1,400																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 1,400																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 90,200																				
Total Revenue	\$ 189,413	\$ 96,527	\$ 96,698	\$ 96,926	\$ 97,097	\$ 7,068	\$ 7,239	\$ 7,467	\$ 7,638	\$ 7,695	\$ 5,586	\$ 5,643	\$ 5,700	\$ 6,042	\$ 6,384	\$ 6,726	\$ 7,125	\$ 7,524	\$ 7,923	\$ 8,436	\$ 8,892
Total Costs																					
Capital Cost Expenditures	\$ 902,000																				
O&M Expenditures	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960
Total Cost	\$ 904,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960
Present Worth Analysis																					
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746	0.4564
Present Worth Total Revenues	\$ 189,413	\$ 92,814	\$ 89,403	\$ 86,167	\$ 82,999	\$ 5,809	\$ 5,721	\$ 5,674	\$ 5,581	\$ 5,406	\$ 3,774	\$ 3,666	\$ 3,560	\$ 3,629	\$ 3,687	\$ 3,735	\$ 3,804	\$ 3,863	\$ 3,911	\$ 4,004	\$ 4,058
Present Worth Capital Cost Expenditures	\$ 902,000																				
Present Worth O&M Expenditures	\$ 2,960	\$ 2,846	\$ 2,736	\$ 2,631	\$ 2,530	\$ 2,433	\$ 2,339	\$ 2,249	\$ 2,163	\$ 2,079	\$ 1,999	\$ 1,923	\$ 1,849	\$ 1,778	\$ 1,709	\$ 1,643	\$ 1,580	\$ 1,519	\$ 1,461	\$ 1,405	\$ 1,351
Present Worth Total Cost	\$ 904,960	\$ 2,846	\$ 2,736	\$ 2,631	\$ 2,530	\$ 2,433	\$ 2,339	\$ 2,249	\$ 2,163	\$ 2,079	\$ 1,999	\$ 1,923	\$ 1,849	\$ 1,778	\$ 1,709	\$ 1,643	\$ 1,580	\$ 1,519	\$ 1,461	\$ 1,405	\$ 1,351
Payback Period																					
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Distribution Overturf																					
Pump-Turbines at Distribution System PRVs																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$768,668																				
Present Worth of Costs	\$968,541																				
Gain / (Loss)	(\$199,873)																				
Capital Costs	\$902,000																				
Turbine and Powerhouse Construction Cost	\$506,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$2,960																				
Period Number	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Year	2013	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447	0.473
Annual Energy Production (MWh)	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
Total Electricity Sales Revenues	\$ 6,213	\$ 9,405	\$ 9,918	\$ 10,488	\$ 11,115	\$ 11,742	\$ 12,369	\$ 13,110	\$ 13,851	\$ 14,649	\$ 15,504	\$ 16,359	\$ 17,271	\$ 18,240	\$ 19,323	\$ 20,406	\$ 21,603	\$ 22,800	\$ 24,111	\$ 25,479	\$ 26,961
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 90,200																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 1,400																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 1,400																				
Energy Trust of Oregon (10% Capital Cost) ²	\$ 90,200																				
Total Revenue	\$ 189,413	\$ 9,405	\$ 9,918	\$ 10,488	\$ 11,115	\$ 11,742	\$ 12,369	\$ 13,110	\$ 13,851	\$ 14,649	\$ 15,504	\$ 16,359	\$ 17,271	\$ 18,240	\$ 19,323	\$ 20,406	\$ 21,603	\$ 22,800	\$ 24,111	\$ 25,479	\$ 26,961
Total Costs																					
Capital Cost Expenditures	\$ 902,000																				
O&M Expenditures	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960
Total Cost	\$ 904,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166	0.2083
Present Worth Total Revenues	\$ 189,413	\$ 4,127	\$ 4,185	\$ 4,255	\$ 4,336	\$ 4,405	\$ 4,461	\$ 4,547	\$ 4,619	\$ 4,697	\$ 4,780	\$ 4,850	\$ 4,923	\$ 4,999	\$ 5,093	\$ 5,171	\$ 5,264	\$ 5,342	\$ 5,432	\$ 5,519	\$ 5,616
Present Worth Capital Cost Expenditures	\$ 902,000																				
Present Worth O&M Expenditures	\$ 2,960	\$ 1,299	\$ 1,249	\$ 1,201	\$ 1,155	\$ 1,110	\$ 1,068	\$ 1,026	\$ 987	\$ 949	\$ 913	\$ 877	\$ 844	\$ 811	\$ 780	\$ 750	\$ 721	\$ 693	\$ 667	\$ 641	\$ 616
Present Worth Total Cost	\$ 904,960	\$ 1,299	\$ 1,249	\$ 1,201	\$ 1,155	\$ 1,110	\$ 1,068	\$ 1,026	\$ 987	\$ 949	\$ 913	\$ 877	\$ 844	\$ 811	\$ 780	\$ 750	\$ 721	\$ 693	\$ 667	\$ 641	\$ 616
Payback Period	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Distribution Overturf											
Pump-Turbines at Distribution System PRVs											
Present Worth Analysis Worksheet - Conceptual and Comparative											
Total 50-year Present Worth											
Present Worth of Revenues	\$768,668										
Present Worth of Costs	\$968,541										
Gain / (Loss)	(\$199,873)										
Capital Costs	\$902,000										
Turbine and Powerhouse Construction Cost	\$506,000										
Operation and Maintenance Costs											
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$2,960										
Period Number	0	41	42	43	44	45	46	47	48	49	50
Year	2013	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues											
Electrical Sales Revenue											
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	57	57	57	57	57	57	57	57	57	57	57
Total Electricity Sales Revenues	\$ 6,213	\$ 28,443	\$ 30,096	\$ 31,749	\$ 33,630	\$ 35,511	\$ 37,563	\$ 39,672	\$ 41,952	\$ 44,346	\$ 46,854
Tax Credits, Grants, Incentives											
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 90,200										
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 1,400										
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 1,400										
Energy Trust of Oregon (10% Capital Cost) ²	\$ 90,200										
Total Revenue	\$ 189,413	\$ 28,443	\$ 30,096	\$ 31,749	\$ 33,630	\$ 35,511	\$ 37,563	\$ 39,672	\$ 41,952	\$ 44,346	\$ 46,854
Total Costs											
Capital Cost Expenditures	\$ 902,000										
O&M Expenditures	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960
Total Cost	\$ 904,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960	\$ 2,960
Present Worth Analysis											
Present Worth Factor	1.0000	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 189,413	\$ 5,697	\$ 5,796	\$ 5,879	\$ 5,988	\$ 6,079	\$ 6,183	\$ 6,279	\$ 6,385	\$ 6,490	\$ 6,593
Present Worth Capital Cost Expenditures	\$ 902,000										
Present Worth O&M Expenditures	\$ 2,960	\$ 593	\$ 570	\$ 548	\$ 527	\$ 507	\$ 487	\$ 468	\$ 450	\$ 433	\$ 416
Present Worth Total Cost	\$ 904,960	\$ 593	\$ 570	\$ 548	\$ 527	\$ 507	\$ 487	\$ 468	\$ 450	\$ 433	\$ 416
Payback Period	no	no	no	no	no	no	no	no	no	no	no
Notes:											
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009											
2. Values based on Jim Doanes email 6-10-2010											

Distribution Awbrey Butte																					
Pump-Turbines at Distribution System PRVs																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$4,344,459																				
Present Worth of Costs	\$1,310,133																				
Gain / (Loss)	\$3,034,326																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$693,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$4,054																				
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148	0.156
Annual Energy Production (MWh)	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Total Electricity Sales Revenues	\$ 87,200	\$ 88,800	\$ 91,200	\$ 94,400	\$ 96,800	\$ 99,200	\$ 101,600	\$ 104,800	\$ 107,200	\$ 108,000	\$ 78,400	\$ 79,200	\$ 80,000	\$ 84,800	\$ 89,600	\$ 94,400	\$ 100,000	\$ 105,600	\$ 111,200	\$ 118,400	\$ 124,800
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 121,900	\$ 121,900	\$ 121,900	\$ 121,900	\$ 121,900																
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 18,200																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 18,200																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 121,900																				
Total Revenue	\$ 367,400	\$ 210,700	\$ 213,100	\$ 216,300	\$ 218,700	\$ 99,200	\$ 101,600	\$ 104,800	\$ 107,200	\$ 108,000	\$ 78,400	\$ 79,200	\$ 80,000	\$ 84,800	\$ 89,600	\$ 94,400	\$ 100,000	\$ 105,600	\$ 111,200	\$ 118,400	\$ 124,800
Total Costs																					
Capital Cost Expenditures	\$ 1,219,000																				
O&M Expenditures	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054
Total Cost	\$ 1,223,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054
Present Worth Analysis																					
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746	0.4564
Present Worth Total Revenues	\$ 367,400	\$ 202,596	\$ 197,023	\$ 192,290	\$ 186,946	\$ 81,535	\$ 80,296	\$ 79,639	\$ 78,330	\$ 75,879	\$ 52,964	\$ 51,447	\$ 49,968	\$ 50,929	\$ 51,742	\$ 52,417	\$ 53,391	\$ 54,212	\$ 54,891	\$ 56,198	\$ 56,957
Present Worth Capital Cost Expenditures	\$ 1,219,000																				
Present Worth O&M Expenditures	\$ 4,054	\$ 3,898	\$ 3,748	\$ 3,604	\$ 3,465	\$ 3,332	\$ 3,204	\$ 3,080	\$ 2,962	\$ 2,848	\$ 2,738	\$ 2,633	\$ 2,532	\$ 2,434	\$ 2,341	\$ 2,251	\$ 2,164	\$ 2,081	\$ 2,001	\$ 1,924	\$ 1,850
Present Worth Total Cost	\$ 1,223,054	\$ 3,898	\$ 3,748	\$ 3,604	\$ 3,465	\$ 3,332	\$ 3,204	\$ 3,080	\$ 2,962	\$ 2,848	\$ 2,738	\$ 2,633	\$ 2,532	\$ 2,434	\$ 2,341	\$ 2,251	\$ 2,164	\$ 2,081	\$ 2,001	\$ 1,924	\$ 1,850
Payback Period																					
	no	no	no	no	no	no	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Distribution Awbrey Butte																					
Pump-Turbines at Distribution System PRVs																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$4,344,459																				
Present Worth of Costs	\$1,310,133																				
Gain / (Loss)	\$3,034,326																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$693,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$4,054																				
Period Number	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Year	2013	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447	0.473
Annual Energy Production (MWh)	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Total Electricity Sales Revenues	\$ 87,200	\$ 132,000	\$ 139,200	\$ 147,200	\$ 156,000	\$ 164,800	\$ 173,600	\$ 184,000	\$ 194,400	\$ 205,600	\$ 217,600	\$ 229,600	\$ 242,400	\$ 256,000	\$ 271,200	\$ 286,400	\$ 303,200	\$ 320,000	\$ 338,400	\$ 357,600	\$ 378,400
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 121,900																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 18,200																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 18,200																				
Energy Trust of Oregon (10% Capital Cost) ²	\$ 121,900																				
Total Revenue	\$ 367,400	\$ 132,000	\$ 139,200	\$ 147,200	\$ 156,000	\$ 164,800	\$ 173,600	\$ 184,000	\$ 194,400	\$ 205,600	\$ 217,600	\$ 229,600	\$ 242,400	\$ 256,000	\$ 271,200	\$ 286,400	\$ 303,200	\$ 320,000	\$ 338,400	\$ 357,600	\$ 378,400
Total Costs																					
Capital Cost Expenditures	\$ 1,219,000																				
O&M Expenditures	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054
Total Cost	\$ 1,223,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166	0.2083
Present Worth Total Revenues	\$ 367,400	\$ 57,926	\$ 58,736	\$ 59,723	\$ 60,859	\$ 61,819	\$ 62,616	\$ 63,814	\$ 64,828	\$ 65,926	\$ 67,090	\$ 68,067	\$ 69,098	\$ 70,168	\$ 71,475	\$ 72,578	\$ 73,880	\$ 74,975	\$ 76,237	\$ 77,464	\$ 78,817
Present Worth Capital Cost Expenditures	\$ 1,219,000																				
Present Worth O&M Expenditures	\$ 4,054	\$ 1,779	\$ 1,710	\$ 1,645	\$ 1,581	\$ 1,521	\$ 1,462	\$ 1,406	\$ 1,352	\$ 1,300	\$ 1,250	\$ 1,202	\$ 1,155	\$ 1,111	\$ 1,068	\$ 1,027	\$ 988	\$ 950	\$ 913	\$ 878	\$ 844
Present Worth Total Cost	\$ 1,223,054	\$ 1,779	\$ 1,710	\$ 1,645	\$ 1,581	\$ 1,521	\$ 1,462	\$ 1,406	\$ 1,352	\$ 1,300	\$ 1,250	\$ 1,202	\$ 1,155	\$ 1,111	\$ 1,068	\$ 1,027	\$ 988	\$ 950	\$ 913	\$ 878	\$ 844
Payback Period																					
	no	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Distribution Awbrey Butte											
Pump-Turbines at Distribution System PRVs											
Present Worth Analysis Worksheet - Conceptual and Comparative											
Total 50-year Present Worth											
Present Worth of Revenues	\$4,344,459										
Present Worth of Costs	\$1,310,133										
Gain / (Loss)	\$3,034,326										
Capital Costs	\$1,219,000										
Turbine and Powerhouse Construction Cost	\$693,000										
Operation and Maintenance Costs											
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$4,054										
Period Number	0	41	42	43	44	45	46	47	48	49	50
Year	2013	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues											
Electrical Sales Revenue											
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	800	800	800	800	800	800	800	800	800	800	800
Total Electricity Sales Revenues	\$ 87,200	\$ 399,200	\$ 422,400	\$ 445,600	\$ 472,000	\$ 498,400	\$ 527,200	\$ 556,800	\$ 588,800	\$ 622,400	\$ 657,600
Tax Credits, Grants, Incentives											
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 121,900										
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 18,200										
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 18,200										
Energy Trust of Oregon (10% Capital Cost) ²	\$ 121,900										
Total Revenue	\$ 367,400	\$ 399,200	\$ 422,400	\$ 445,600	\$ 472,000	\$ 498,400	\$ 527,200	\$ 556,800	\$ 588,800	\$ 622,400	\$ 657,600
Total Costs											
Capital Cost Expenditures	\$ 1,219,000										
O&M Expenditures	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054
Total Cost	\$ 1,223,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054	\$ 4,054
Present Worth Analysis											
Present Worth Factor	1.0000	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 367,400	\$ 79,951	\$ 81,344	\$ 82,511	\$ 84,038	\$ 85,325	\$ 86,784	\$ 88,132	\$ 89,612	\$ 91,083	\$ 92,533
Present Worth Capital Cost Expenditures	\$ 1,219,000										
Present Worth O&M Expenditures	\$ 4,054	\$ 812	\$ 781	\$ 751	\$ 722	\$ 694	\$ 667	\$ 642	\$ 617	\$ 593	\$ 570
Present Worth Total Cost	\$ 1,223,054	\$ 812	\$ 781	\$ 751	\$ 722	\$ 694	\$ 667	\$ 642	\$ 617	\$ 593	\$ 570
Payback Period	no	41	42	43	44	45	46	47	48	49	50
Notes:											
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009											
2. Values based on Jim Doanes email 6-10-2010											

Distribution Athletic Club																					
Pump-Turbines at Distribution System PRVs																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$1,349,294																				
Present Worth of Costs	\$1,004,040																				
Gain / (Loss)	\$345,254																				
Capital Costs	\$935,000																				
Turbine and Powerhouse Construction Cost	\$525,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$3,071																				
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148	0.156
Annual Energy Production (MWh)	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Total Electricity Sales Revenues	\$ 19,620	\$ 19,980	\$ 20,520	\$ 21,240	\$ 21,780	\$ 22,320	\$ 22,860	\$ 23,580	\$ 24,120	\$ 24,300	\$ 17,640	\$ 17,820	\$ 18,000	\$ 19,080	\$ 20,160	\$ 21,240	\$ 22,500	\$ 23,760	\$ 25,020	\$ 26,640	\$ 28,080
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 93,500	\$ 93,500	\$ 93,500	\$ 93,500	\$ 93,500																
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 4,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 4,000																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 93,500																				
Total Revenue	\$ 214,620	\$ 113,480	\$ 114,020	\$ 114,740	\$ 115,280	\$ 22,320	\$ 22,860	\$ 23,580	\$ 24,120	\$ 24,300	\$ 17,640	\$ 17,820	\$ 18,000	\$ 19,080	\$ 20,160	\$ 21,240	\$ 22,500	\$ 23,760	\$ 25,020	\$ 26,640	\$ 28,080
Total Costs																					
Capital Cost Expenditures	\$ 935,000																				
O&M Expenditures	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071
Total Cost	\$ 938,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071
Present Worth Analysis																					
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746	0.4564
Present Worth Total Revenues	\$ 214,620	\$ 109,115	\$ 105,418	\$ 102,003	\$ 98,542	\$ 18,345	\$ 18,067	\$ 17,919	\$ 17,624	\$ 17,073	\$ 11,917	\$ 11,576	\$ 11,243	\$ 11,459	\$ 11,642	\$ 11,794	\$ 12,013	\$ 12,198	\$ 12,351	\$ 12,644	\$ 12,815
Present Worth Capital Cost Expenditures	\$ 935,000																				
Present Worth O&M Expenditures	\$ 3,071	\$ 2,953	\$ 2,839	\$ 2,730	\$ 2,625	\$ 2,524	\$ 2,427	\$ 2,334	\$ 2,244	\$ 2,158	\$ 2,075	\$ 1,995	\$ 1,918	\$ 1,844	\$ 1,773	\$ 1,705	\$ 1,640	\$ 1,577	\$ 1,516	\$ 1,458	\$ 1,402
Present Worth Total Cost	\$ 938,071	\$ 2,953	\$ 2,839	\$ 2,730	\$ 2,625	\$ 2,524	\$ 2,427	\$ 2,334	\$ 2,244	\$ 2,158	\$ 2,075	\$ 1,995	\$ 1,918	\$ 1,844	\$ 1,773	\$ 1,705	\$ 1,640	\$ 1,577	\$ 1,516	\$ 1,458	\$ 1,402
Payback Period	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Distribution Athletic Club																					
Pump-Turbines at Distribution System PRVs																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$1,349,294																				
Present Worth of Costs	\$1,004,040																				
Gain / (Loss)	\$345,254																				
Capital Costs	\$935,000																				
Turbine and Powerhouse Construction Cost	\$525,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$3,071																				
Period Number	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Year	2013	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447	0.473
Annual Energy Production (MWh)	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Total Electricity Sales Revenues	\$ 19,620	\$ 29,700	\$ 31,320	\$ 33,120	\$ 35,100	\$ 37,080	\$ 39,060	\$ 41,400	\$ 43,740	\$ 46,260	\$ 48,960	\$ 51,660	\$ 54,540	\$ 57,600	\$ 61,020	\$ 64,440	\$ 68,220	\$ 72,000	\$ 76,140	\$ 80,460	\$ 85,140
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 93,500																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 4,000																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 4,000																				
Energy Trust of Oregon (10% Capital Cost)2	\$ 93,500																				
Total Revenue	\$ 214,620	\$ 29,700	\$ 31,320	\$ 33,120	\$ 35,100	\$ 37,080	\$ 39,060	\$ 41,400	\$ 43,740	\$ 46,260	\$ 48,960	\$ 51,660	\$ 54,540	\$ 57,600	\$ 61,020	\$ 64,440	\$ 68,220	\$ 72,000	\$ 76,140	\$ 80,460	\$ 85,140
Total Costs																					
Capital Cost Expenditures	\$ 935,000																				
O&M Expenditures	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071
Total Cost	\$ 938,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166	0.2083
Present Worth Total Revenues	\$ 214,620	\$ 13,033	\$ 13,216	\$ 13,438	\$ 13,693	\$ 13,909	\$ 14,089	\$ 14,358	\$ 14,586	\$ 14,833	\$ 15,095	\$ 15,315	\$ 15,547	\$ 15,788	\$ 16,082	\$ 16,330	\$ 16,623	\$ 16,869	\$ 17,153	\$ 17,429	\$ 17,734
Present Worth Capital Cost Expenditures	\$ 935,000																				
Present Worth O&M Expenditures	\$ 3,071	\$ 1,348	\$ 1,296	\$ 1,246	\$ 1,198	\$ 1,152	\$ 1,108	\$ 1,065	\$ 1,024	\$ 985	\$ 947	\$ 910	\$ 875	\$ 842	\$ 809	\$ 778	\$ 748	\$ 719	\$ 692	\$ 665	\$ 640
Present Worth Total Cost	\$ 938,071	\$ 1,348	\$ 1,296	\$ 1,246	\$ 1,198	\$ 1,152	\$ 1,108	\$ 1,065	\$ 1,024	\$ 985	\$ 947	\$ 910	\$ 875	\$ 842	\$ 809	\$ 778	\$ 748	\$ 719	\$ 692	\$ 665	\$ 640
Payback Period	no	no	no	no	no	no	no	no	no	no	no	31	32	33	34	35	36	37	38	39	40
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Distribution Athletic Club											
Pump-Turbines at Distribution System PRVs											
Present Worth Analysis Worksheet - Conceptual and Comparative											
Total 50-year Present Worth											
Present Worth of Revenues	\$1,349,294										
Present Worth of Costs	\$1,004,040										
Gain / (Loss)	\$345,254										
Capital Costs											
Turbine and Powerhouse Construction Cost	\$935,000										
	\$525,000										
Operation and Maintenance Costs											
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$3,071										
Period Number	0	41	42	43	44	45	46	47	48	49	50
Year	2013	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues											
Electrical Sales Revenue											
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	180	180	180	180	180	180	180	180	180	180	180
Total Electricity Sales Revenues	\$ 19,620	\$ 89,820	\$ 95,040	\$ 100,260	\$ 106,200	\$ 112,140	\$ 118,620	\$ 125,280	\$ 132,480	\$ 140,040	\$ 147,960
Tax Credits, Grants, Incentives											
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 93,500										
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 4,000										
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 4,000										
Energy Trust of Oregon (10% Capital Cost) ²	\$ 93,500										
Total Revenue	\$ 214,620	\$ 89,820	\$ 95,040	\$ 100,260	\$ 106,200	\$ 112,140	\$ 118,620	\$ 125,280	\$ 132,480	\$ 140,040	\$ 147,960
Total Costs											
Capital Cost Expenditures	\$ 935,000										
O&M Expenditures	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071
Total Cost	\$ 938,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071	\$ 3,071
Present Worth Analysis											
Present Worth Factor	1.0000	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 214,620	\$ 17,989	\$ 18,302	\$ 18,565	\$ 18,909	\$ 19,198	\$ 19,526	\$ 19,830	\$ 20,163	\$ 20,494	\$ 20,820
Present Worth Capital Cost Expenditures	\$ 935,000										
Present Worth O&M Expenditures	\$ 3,071	\$ 615	\$ 591	\$ 569	\$ 547	\$ 526	\$ 506	\$ 486	\$ 467	\$ 449	\$ 432
Present Worth Total Cost	\$ 938,071	\$ 615	\$ 591	\$ 569	\$ 547	\$ 526	\$ 506	\$ 486	\$ 467	\$ 449	\$ 432
Payback Period											
	no	41	42	43	44	45	46	47	48	49	50
Notes:											
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009											
2. Values based on Jim Doanes email 6-10-2010											

Distribution Wichita																					
Pump-Turbines at Distribution System PRVs																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$1,331,209																				
Present Worth of Costs	\$1,056,854																				
Gain / (Loss)	\$274,355																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$984,000																				
	\$554,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$3,241																				
Period Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.111	0.114	0.118	0.121	0.124	0.127	0.131	0.134	0.135	0.098	0.099	0.100	0.106	0.112	0.118	0.125	0.132	0.139	0.148	0.156
Annual Energy Production (MWh)	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
Total Electricity Sales Revenues	\$ 18,530	\$ 18,870	\$ 19,380	\$ 20,060	\$ 20,570	\$ 21,080	\$ 21,590	\$ 22,270	\$ 22,780	\$ 22,950	\$ 16,660	\$ 16,830	\$ 17,000	\$ 18,020	\$ 19,040	\$ 20,060	\$ 21,250	\$ 22,440	\$ 23,630	\$ 25,160	\$ 26,520
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 98,400	\$ 98,400	\$ 98,400	\$ 98,400	\$ 98,400																
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 3,800																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 3,800																				
Energy Trust of Oregon (10% Capital Cost) ²	\$ 98,400																				
Total Revenue	\$ 222,930	\$ 117,270	\$ 117,780	\$ 118,460	\$ 118,970	\$ 21,080	\$ 21,590	\$ 22,270	\$ 22,780	\$ 22,950	\$ 16,660	\$ 16,830	\$ 17,000	\$ 18,020	\$ 19,040	\$ 20,060	\$ 21,250	\$ 22,440	\$ 23,630	\$ 25,160	\$ 26,520
Total Costs																					
Capital Cost Expenditures	\$ 984,000																				
O&M Expenditures	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	
Total Cost	\$ 987,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	
Present Worth Analysis																					
Present Worth Factor	1.0000	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756	0.6496	0.6246	0.6006	0.5775	0.5553	0.5339	0.5134	0.4936	0.4746	0.4564
Present Worth Total Revenues	\$ 222,930	\$ 112,760	\$ 108,894	\$ 105,311	\$ 101,696	\$ 17,326	\$ 17,063	\$ 16,923	\$ 16,645	\$ 16,124	\$ 11,255	\$ 10,932	\$ 10,618	\$ 10,822	\$ 10,995	\$ 11,139	\$ 11,346	\$ 11,520	\$ 11,664	\$ 11,942	\$ 12,103
Present Worth Capital Cost Expenditures	\$ 984,000																				
Present Worth O&M Expenditures	\$ 3,241	\$ 3,116	\$ 2,996	\$ 2,881	\$ 2,770	\$ 2,663	\$ 2,561	\$ 2,463	\$ 2,368	\$ 2,277	\$ 2,189	\$ 2,105	\$ 2,024	\$ 1,946	\$ 1,871	\$ 1,799	\$ 1,730	\$ 1,664	\$ 1,600	\$ 1,538	\$ 1,479
Present Worth Total Cost	\$ 987,241	\$ 3,116	\$ 2,996	\$ 2,881	\$ 2,770	\$ 2,663	\$ 2,561	\$ 2,463	\$ 2,368	\$ 2,277	\$ 2,189	\$ 2,105	\$ 2,024	\$ 1,946	\$ 1,871	\$ 1,799	\$ 1,730	\$ 1,664	\$ 1,600	\$ 1,538	\$ 1,479
Payback Period																					
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Distribution Wichita																					
Pump-Turbines at Distribution System PRVs																					
Present Worth Analysis Worksheet - Conceptual and Comparative																					
Total 50-year Present Worth																					
Present Worth of Revenues	\$1,331,209																				
Present Worth of Costs	\$1,056,854																				
Gain / (Loss)	\$274,355																				
Capital Costs																					
Turbine and Powerhouse Construction Cost	\$984,000																				
	\$554,000																				
Operation and Maintenance Costs																					
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$3,241																				
Period Number	0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Year	2013	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Total Revenues																					
Electrical Sales Revenue																					
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.165	0.174	0.184	0.195	0.206	0.217	0.230	0.243	0.257	0.272	0.287	0.303	0.320	0.339	0.358	0.379	0.400	0.423	0.447	0.473
Annual Energy Production (MWh)	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
Total Electricity Sales Revenues	\$ 18,530	\$ 28,050	\$ 29,580	\$ 31,280	\$ 33,150	\$ 35,020	\$ 36,890	\$ 39,100	\$ 41,310	\$ 43,690	\$ 46,240	\$ 48,790	\$ 51,510	\$ 54,400	\$ 57,630	\$ 60,860	\$ 64,430	\$ 68,000	\$ 71,910	\$ 75,990	\$ 80,410
Tax Credits, Grants, Incentives																					
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 98,400																				
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW) ²	\$ 3,800																				
Federal Renewable Energy Grants (\$200/kW for 1st 2MW) ²	\$ 3,800																				
Energy Trust of Oregon (10% Capital Cost) ²	\$ 98,400																				
Total Revenue	\$ 222,930	\$ 28,050	\$ 29,580	\$ 31,280	\$ 33,150	\$ 35,020	\$ 36,890	\$ 39,100	\$ 41,310	\$ 43,690	\$ 46,240	\$ 48,790	\$ 51,510	\$ 54,400	\$ 57,630	\$ 60,860	\$ 64,430	\$ 68,000	\$ 71,910	\$ 75,990	\$ 80,410
Total Costs																					
Capital Cost Expenditures	\$ 984,000																				
O&M Expenditures	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	
Total Cost	\$ 987,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	
Present Worth Analysis																					
Present Worth Factor	1.0000	0.4388	0.4220	0.4057	0.3901	0.3751	0.3607	0.3468	0.3335	0.3207	0.3083	0.2965	0.2851	0.2741	0.2636	0.2534	0.2437	0.2343	0.2253	0.2166	0.2083
Present Worth Total Revenues	\$ 222,930	\$ 12,309	\$ 12,481	\$ 12,691	\$ 12,933	\$ 13,137	\$ 13,306	\$ 13,561	\$ 13,776	\$ 14,009	\$ 14,257	\$ 14,464	\$ 14,683	\$ 14,911	\$ 15,189	\$ 15,423	\$ 15,700	\$ 15,932	\$ 16,200	\$ 16,461	\$ 16,749
Present Worth Capital Cost Expenditures	\$ 984,000																				
Present Worth O&M Expenditures	\$ 3,241	\$ 1,422	\$ 1,367	\$ 1,315	\$ 1,264	\$ 1,216	\$ 1,169	\$ 1,124	\$ 1,081	\$ 1,039	\$ 999	\$ 961	\$ 924	\$ 888	\$ 854	\$ 821	\$ 790	\$ 759	\$ 730	\$ 702	\$ 675
Present Worth Total Cost	\$ 987,241	\$ 1,422	\$ 1,367	\$ 1,315	\$ 1,264	\$ 1,216	\$ 1,169	\$ 1,124	\$ 1,081	\$ 1,039	\$ 999	\$ 961	\$ 924	\$ 888	\$ 854	\$ 821	\$ 790	\$ 759	\$ 730	\$ 702	\$ 675
Payback Period																					
	no	no	no	no	no	no	no	no	no	no	no	no	no	no	34	35	36	37	38	39	40
Notes:																					
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009																					
2. Values based on Jim Doanes email 6-10-2010																					

Distribution Wichita											
Pump-Turbines at Distribution System PRVs											
Present Worth Analysis Worksheet - Conceptual and Comparative											
Total 50-year Present Worth											
Present Worth of Revenues	\$1,331,209										
Present Worth of Costs	\$1,056,854										
Gain / (Loss)	\$274,355										
Capital Costs	\$984,000										
Turbine and Powerhouse Construction Cost	\$554,000										
Operation and Maintenance Costs											
O&M Costs (Start year, @ 0.05% of Construction Cost)	\$3,241										
Period Number	0	41	42	43	44	45	46	47	48	49	50
Year	2013	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Total Revenues											
Electrical Sales Revenue											
Cost of Energy (\$/KWh) ^{1,2}	0.109	0.499	0.528	0.557	0.590	0.623	0.659	0.696	0.736	0.778	0.822
Annual Energy Production (MWh)	170	170	170	170	170	170	170	170	170	170	170
Total Electricity Sales Revenues	\$ 18,530	\$ 84,830	\$ 89,760	\$ 94,690	\$ 100,300	\$ 105,910	\$ 112,030	\$ 118,320	\$ 125,120	\$ 132,260	\$ 139,740
Tax Credits, Grants, Incentives											
Oregon Business Energy Tax Credit 2 (50% construction cost up to \$10 million/program)	\$ 98,400										
Federal Business Energy Investment Tax Credit (\$200/kW for 1st 2MW)2	\$ 3,800										
Federal Renewable Energy Grants (\$200/kW for 1st 2MW)2	\$ 3,800										
Energy Trust of Oregon (10% Capital Cost)2	\$ 98,400										
Total Revenue	\$ 222,930	\$ 84,830	\$ 89,760	\$ 94,690	\$ 100,300	\$ 105,910	\$ 112,030	\$ 118,320	\$ 125,120	\$ 132,260	\$ 139,740
Total Costs											
Capital Cost Expenditures	\$ 984,000										
O&M Expenditures	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241
Total Cost	\$ 987,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241	\$ 3,241
Present Worth Analysis											
Present Worth Factor	1.0000	0.2003	0.1926	0.1852	0.1780	0.1712	0.1646	0.1583	0.1522	0.1463	0.1407
Present Worth Total Revenues	\$ 222,930	\$ 16,990	\$ 17,286	\$ 17,534	\$ 17,858	\$ 18,132	\$ 18,442	\$ 18,728	\$ 19,043	\$ 19,355	\$ 19,663
Present Worth Capital Cost Expenditures	\$ 984,000										
Present Worth O&M Expenditures	\$ 3,241	\$ 649	\$ 624	\$ 600	\$ 577	\$ 555	\$ 533	\$ 513	\$ 493	\$ 474	\$ 456
Present Worth Total Cost	\$ 987,241	\$ 649	\$ 624	\$ 600	\$ 577	\$ 555	\$ 533	\$ 513	\$ 493	\$ 474	\$ 456
Payback Period	no	41	42	43	44	45	46	47	48	49	50
Notes:											
1. Values based on Jim Doanes "Value of Power Production 061009.xls" spreadsheet emailed 6-10-2009											
2. Values based on Jim Doanes email 6-10-2010											