

SMALL HYDROPOWER PROJECT FINANCIAL SIMULATION MODEL

**(A TOOL FOR PLANNING INVESTMENTS UNDER
THE "SECOND WINDOW" OF THE NEPAL
POWER DEVELOPMENT FUND)**

Prepared for

His Majesty's Government of Nepal
Ministry of Water Resources
Electricity Development Center

Under the

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1 Purpose

The purpose of the Small Hydropower Project Financial Simulation Model (*SmallFinSim*) is to provide the Electricity Development Center and the Ministry of Water Resources with a simple tool for analyzing the commercial viability of small-scale hydropower projects that may be eligible for funding under the World Bank's proposed Power Development Fund's (PDF) "second window". The PDF's investment policy with regard to the second window can be summarized as follows:

- ▶ The PDF may finance (i) individual investments not exceeding twenty-five (25) percent of total project cost (defined to include interest and fees during construction, sponsor's costs and initial working capital), (ii) projects utilizing proven technologies posing low risks of obsolescence, and (iii) projects respecting the environmental guidelines and resettlement policies of both HMGN and the World Bank Group.
- ▶ The PDF may not (i) fund projects which are not or cannot be licensed by MOWR's EDC, (ii) take management control over any investment, (iii) make any investment which exposes the PDF to unlimited liability, (iv) invest in any single project more than one-fifth (1/5) of its capitalization allocated to the second PDF window, (v) invest in any single project which does not have a debt service coverage ratio of at least 1.2 times, or (vi) invest in projects with less than an eighty to twenty (80/20) percent debt to equity ratio.

Accordingly, it is the intent of *SmallFinSim* to assist in identifying a number of requisite factors to ensure conformity with the investment policy of the PDF's second window.

This tool is not intended to precisely model every aspect of a particular small hydropower project. Rather, it is intended to simply define relative orders of magnitude and the manner in which specific resources and variables should be applied in order to produce a commercially viable project eligible for PDF financing.

2 Structure and Description of the Model

The Small Hydropower Project Financial Simulation Model (*SmallFinSim*) is an Excel™-based spreadsheet containing eight, connected worksheets. Item 4 presents a sequential list of these worksheets and a description of their function. A printout of each worksheet is attached for reference.

3 General Treatment of Data

Make a copy of the model (file name “smfinsim”) before making changes or manipulating data Copy the model to a new file and name that file after the project you are analyzing. The numerous linkages between input and output data, between worksheets in the model, and the level of detail of the large number of formulae will be difficult and time consuming to recreate should the model become corrupted. It will also save time to revert back to the original model and begin again should the user encounter errors after changes are made to base case data.

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4 Sources of Data for the Base Case Scenario

Worksheets 1 through 4-5 of the spreadsheet model contain basic data available from a given feasibility study (in the base case scenario that of the Nyadi Hydropower Project Desk Study undertaken by BPC Hydroconsult for the Lamjung Electricity Development Company) Note that only the **blue-colored** input data contained in these worksheets can be changed to generate smaller or larger degrees of sensitivity analyses

4.1 Worksheet 1 Simulation of Average Monthly Generation and Revenue

1	Installed Capacity (mega watts)	Nyadi Hydropower Project Desk Study
2	Design Head (meters)	Nyadi Hydropower Project Desk Study
3	Design Discharge (cubic meters/second)	Nyadi Hydropower Project Desk Study
4	Base Year Tariff to NEA	Tariff Collected by Butwal Power Company Limited
5	Exchange Rate NPRs US\$	Nepal Rastra Bank
6	London Interbank Offer Rate (LIBOR)	<u>International Herald Tribune</u>
7	Country Risk Premium (Basis Points)	Assumed
8	Nepalese Inflation	Interpolated
9	United States Inflation	U S Embassy
10	Currency Devaluer	9 minus 8
11	Operation and Maintenance Costs	Typical Costs Based on Capital Costs
12	Insurance Costs	Typical Costs Based on Capital Costs
13	Administration Costs	Typical Costs Based on Capital Costs
14	Annual Cost Escalator	Assumed
15	Annual Retained Earnings Distribution	Assumed

4.2 Worksheet 2 Average Tariff Calculation

1	Projected Tariff Increases	Assumed
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4.3 Worksheet 3 Summary of Investment Plan

1	Cost Estimates of Investment Categories	Nyadi Hydropower Project Desk Study
2	Interest During Construction	Calculated on Worksheet 4 - 5

4.4 Worksheet 4 Projected Cash Flows Worksheet 5 Financial Rates of Return

1	Construction Cost Distribution	Assumed
2	Interest During Construction	Calculated on Worksheet 4
3	Interest Rate per Annum – US\$ Denominated Loan	LIBOR plus Country Risk Premium
4	Interest Rate per Annum – NPRs Denominated Loan	Assumed
5	Proportion of Loan Denominated in US\$	Assumed
6	Proportion of Loan Denominated in NPRs	Assumed

4 5 Worksheet 6 Projected Income Statement

All data derived from previous worksheets

4 6 Worksheet 7 Projected Balance Sheet

All data derived from previous worksheets

4 7 Worksheet 8 Sensitivity Analyses -- Feasibility Indicators

This worksheet contains a table comparing the output of the base case/new case sensitivity analyses using the parameters entered in the column ' Variable' These assumptions vis-a-vis the base case scenario indicate that the project is most sensitive (in terms of financial rates of return) to tariff increases and interest rate decreases for both US\$ and NPRs denominated loans The user is encouraged to experiment with a variety of assumptions in order to arrive at the desirable combination of values which represent a truly commercially viable project

Key feasibility indicators include, *inter alia*, the current ratio and the debt coverage ratio The current ratio is computed by dividing current assets by current liabilities The ratio shows a company's ability to pay its current obligations from current assets The debt coverage ratio is calculated by dividing net cash flow plus interest expense by repayment of long-term debt plus interest This ratio measure a firm's leverage, debt exposure financial risk and ability to meet debt service and other fixed obligations

5 Tariff Elements

Worksheet 2 of *SmallFinSim* takes the assumed average tariff for the base year from Worksheet 1 generates energy charge data and makes assumptions regarding projected tariff increases during a period of twenty years. The user is encouraged to experiment with not only average initial tariff scenarios but also with various levels of escalation over the twenty year period considered by the model.

6 Cost Elements

Worksheet 3 of *SmallFinSim* contains line-item information of the estimated project. To change from the base case scenario, enter detailed before interest during construction (IDC) cost information, if it is available. Cost estimates can be adjusted here to match assumptions made by developers or additional assumptions made by EDC. For example, EDC might have more accurate information on contingency percentages to generate a more accurate cost estimate before IDC.

The total cost estimate before IDC is calculated on the basis of individual cost items and then entered automatically into Worksheet 4-5, Projected Cash Flows and Financial Rates of Return. Note that *SmallFinSim* assumes capitalization of IDC. IDC is therefore calculated on the basis of the estimated cost figure before IDC and distribution of debt and equity during construction as specified on Worksheet 4-5. The IDC Table on Worksheet 4-5 automatically generates total IDC and adds that amount to derive the total project cost. IDC therefore becomes part of the overall debt requirement of the project.

7 Debt and Equity Elements

Worksheet 4 - 5 contains two loans to which all or part of the total debt financing requirement of the project can be assigned. In the base case scenario, the first loan is a US\$ denominated loan with a 15 year maturity and no grace period. The second loan, assumed to be sourced from the second window of the Power Development Fund, is a Nepali Rupees (NPRs) denominated loan with a 10 year maturity and a three year grace period. The interest and principal payment schedules of these two loans will be generated automatically on the basis of the interest rate figures specified on Worksheets 1 and 4 - 5. The interest rates for each can be changed in the respective base case assumptions for these two loans.

Principal and interest payments on the NPRs denominated loan are devaluated by a currency devaluer derived from the input data contained on Worksheet 1. This accounts for the dollar-equivalent reduction in the cost of the NPRs denominated loan over time. As a result, the lower cost of principal and interest repayment of the NPRs denominated loan is reflected in the higher net income generated by the project (i.e. the line item Before Tax Income in the Income Statement on Worksheet 6 will rise with a higher proportion of debt allocated to NPRs financing). Note that the model does not allow for automatic adjustment of changes in maturity terms of the loans. Maturity terms of each loan can only be changed manually in the worksheet on Worksheet 4-5. Any changes made to the maturity terms or the debt schedule entered on Worksheet 4-5 will be entered automatically into the model's cash flow, income statement and balance sheet.

Allocation of debt and equity funds during the project development phase is broken down on Worksheet 4-5. This allows the user to adjust the distribution of debt and equity during the construction period, illustrating how funds will be distributed during the years preceding operation of the facility. *SmallFinSim* allocates debt and equity expenditures according to different scenarios of proportions of total debt and/or total equity disbursed in each of four years. IDC is generated automatically.

8 Cash Flow, Income Statement and Balance Sheet

The cash flow, income statement and balance sheet contained in Worksheet 4-5, Worksheet 6 and Worksheet 7, respectively, are projected out over a period of 20 years. The cash flow is the basis for the calculation of the project's internal rate of return (IRR). It is important to adjust the IRR according to the time period desired (e.g. over 10, 15 or 20 years). The IRR calculations appear immediately after the cash flow in Worksheet 4-5.

An accounting of the affects of taxes is made in the income statement, as prescribed by existing laws and licensing terms. Any changes in the existing laws, such as tax holiday provisions and depreciation schedules must be made manually in the income statement contained on Worksheet 6.

The balance sheet contains basic information on the assets and liabilities of the project which are automatically adjusted for any changes in the distribution of retained earnings (i.e., dividends paid). Immediately below the balance sheet are the key financial ratios on an annual basis.

Worksheets

HYPOTHETICAL SMALL HYDROPOWER PROJECT ELIGIBLE FOR FINANCING UNDER THE NEPAL POWER DEVELOPMENT FUND S SECOND WINDOW

SPREADSHEET INDEX	
1	SIMULATION OF AVERAGE MONTHLY GENERATION AND REVENUE
2	AVERAGE TARIFF CALCULATION
3	SUMMARY OF INVESTMENT PLAN
4	PROJECTED CASH FLOWS
6	PROJECTED INCOME STATEMENT
7	PROJECTED BALANCE SHEET
8	SENSITIVITY ANALYSES -- FEASIBILITY INDICATORS

KEY VARIABLES	
INSTALLED CAPACITY	10000 kiloWatts (kW)
DESIGN HEAD	253 0 Meters
DESIGN DISCHARGE	5 0 Cubic Meters/Second
BASE YEAR TARIFF TO NEA	2 77 Nepali Rupees (NPRs)
EXCHANGE RATE NPR/US\$	67 85
LONDON INTERBANK OFFER RATE (LIBOR)	5 625%
COUNTRY RISK PREMIUM (BASIS POINTS)	400
NEPALESE INFLATION	9 0 %
UNITED STATES INFLATION	2 5%
CURRENCY DEVALUER	6 5%
O&M COSTS	14 0 US\$/kW
INSURANCE COSTS	11 0 US\$/kW
ADMINISTRATION COSTS	2 8 US\$/kW
ANNUAL O&M INSURANCE AND ADMINISTRATION COST ESCALATOR	2 0%
RETAINED EARNINGS DISTRIBUTION	50 0%

PROJECT DATA	
TOTAL PROJECT COST INCLUDING IDC	\$21 974 855
INTEREST DURING CONSTRUCTION (IDC)	\$2 753 955
BASE YEAR COST OF O&M	\$278 000
INSTALLED COST \$/kW	\$2 197

1 SIMULATION OF AVERAGE MONTHLY GENERATION AND REVENUE FLOW DATA (1982-86) AND BASE YEAR TARIFF STRUCTURE

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Values	
Average Flow m3/second	4 0	3 4	3 2	3 4	4 5	12 3	33 9	42 2	31 2	15 3	8 6	5 4	Average	14 0
Total Generation GWh	6 2	4 7	4 9	5 1	7 0	7 7	7 7	3 7	7 7	7 7	7 7	7 7	Total	78 0
Total Sales Thousands of US\$	252 4	193 8	201 9	207 6	283 9	315 5	315 5	152 7	315 5	315 5	315 5	315 5	Total	\$3 185 2
Energy Charge to NEA US\$/kWh	0 0408	0 0408	0 0408	0 0408	0 0408	0 0408	0 0408	0 0408	0 0408	0 0408	0 0408	0 0408	Average	0 0408

HYPOTHETICAL SMALL HYDROPOWER PROJECT

10 MW

2 AVERAGE TARIFF CALCULATION

MONTH	INSTALLED CAPACITY	TOTAL GENERATION	ENERGY TARIFF	ENERGY REVENUES	AVERAGE TARIFF	
JAN	10 000	6 182	0 0408	252 4	0 0408	
FEB	10 000	4 746	0 0408	193 8	0 0408	
MAR	10 000	4 946	0 0408	201 9	0 0408	
APRIL	10 000	5 085	0 0408	207 6	0 0408	
MAY	10 000	6 955	0 0408	283 9	0 0408	
JUNE	10 000	7 728	0 0408	315 5	0 0408	
JULY	10 000	7 728	0 0408	315 5	0 0408	
AUG	10 000	3 739	0 0408	152 7	0 0408	
SEP	10 000	7 728	0 0408	315 5	0 0408	
OCT	10 000	7 728	0 0408	315 5	0 0408	PROJECTED
NOV	10 000	7 728	0 0408	315 5	0 0408	TARIFF
DEC	10 000	7 728	0 0408	315 5	0 0408	INCREASES

YEAR	2003	78 021	3 185 244	0 0408	
	2004	78 021	3 217 097	0 0412	1%
	2005	78 021	3 217 097	0 0412	
	2006	78 021	3 217 097	0 0412	
	2007	78 021	3 217 097	0 0412	
	2008	78 021	3 281 439	0 0421	2%
	2009	78 021	3 281 439	0 0421	
	2010	78 021	3 281 439	0 0421	
	2011	78 021	3 281 439	0 0421	
	2012	78 021	3 281 439	0 0421	
	2013	78 021	3 281 439	0 0421	
	2014	78 021	3 412 696	0 0429	4%
	2015	78 021	3 412 696	0 0429	
	2016	78 021	3 412 696	0 0429	
	2017	78 021	3 412 696	0 0429	
	2018	78 021	3 412 696	0 0429	
	2019	78 021	3 412 696	0 0429	
	2020	78 021	3 412 696	0 0429	
	2021	78 021	3 412 696	0 0429	
	2022	78 021	3 412 696	0 0429	
TOTALS		1 560 425	66 456 528	0 0426	

TWENTY YEAR AVERAGE TARIFF US\$/kWh 0 0426

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HYPOTHETICAL SMALL HYDROPOWER PROJECT

10 MW

3 SUMMARY OF INVESTMENT PLAN

INVESTMENT CATEGORIES	COST ESTIMATES		PROMOTER'S OWN FUNDS	SECOND WINDOW LOAN	OTHER LOAN SOURCES
		%			
Mobilization and Camp	\$320,000	1.46%			
Operators' Housing	30,000	0.14%			
Headworks	3,145,000	14.31%			
Headrace Tunnel and Penstock	3,954,000	17.99%			
Powerhouse Structure	343,000	1.56%			
Electromechanical Equipment	7,466,000	33.98%			
Access Road	1,010,000	4.60%			
A SUBTOTAL	16,268,000	74.03%			
Geological Studies	100,000	0.46%			
Engineering Design and Supervision (10% of Subtotal A)	1,626,800	7.40%			
Land, Construction and Operating License	6,000	0.03%			
Contingencies (7.5% of Subtotal A)	1,220,100	5.55%			
B SUBTOTAL	2,952,900	13.44%	\$8,789,942	\$1,977,737	\$13,184,913
C INTEREST DURING CONSTRUCTION	2,753,955	12.53%			
OVERALL TOTAL (A+B+C)	\$21,974,855	100.00%			

HYPOTHETICAL SMALL HYDROPOWER PROJECT

10 MW

6 PROJECTED INCOME STATEMENT

ITEM	YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
MWh Sold		78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021	78 021
Average Energy Charge – \$/kWh		0 0408	0 0412	0 0412	0 0412	0 0412	0 0421	0 0421	0 0421	0 0421	0 0421	0 0421	0 0437	0 0437	0 0437	0 0437	0 0437	0 0437	0 0437	0 0437	0 0437
OPERATING REVENUES – US\$		3 185 244	3 217 097	3 217 097	3 217 097	3 217 097	3 281 439	3 281 439	3 281 439	3 281 439	3 281 439	3 281 439	3 412 696	3 412 696	3 412 696	3 412 696	3 412 696	3 412 696	3 412 696	3 412 696	3 412 696
() OPERATING COSTS – US\$																					
Maintenance		140 000	142 800	145 656	148 569	151 541	154 571	157 663	160 816	164 032	167 313	170 659	174 072	177 554	181 105	184 727	188 422	192 190	196 034	199 954	203 954
Insurance		110 000	112 200	114 444	116 733	119 068	121 449	123 878	126 355	128 883	131 460	134 089	136 771	139 507	142 297	145 143	148 046	151 006	154 027	157 107	160 249
Depreciation of Fixed Assets		1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393	1 281 393
Recovery of IDC		183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597	183 597
Administrative Overhead		28 000	28 560	29 131	29 714	30 308	30 914	31 533	32 163	32 806	33 463	34 132	34 814	35 511	36 221	36 945	37 684	38 438	39 207	39 991	40 791
Total Operating Costs		1 742 990	1 748 550	1 754 222	1 760 006	1 765 906	1 771 925	1 778 063	1 784 325	1 790 712	1 797 226	1 803 871	1 810 649	1 817 562	1 824 613	1 831 805	1 839 142	1 846 625	1 854 257	1 862 043	1 869 984
NET OPERATING INCOME		1 442 254	1 468 546	1 462 875	1 457 091	1 451 190	1 509 514	1 503 375	1 497 114	1 490 727	1 484 213	1 477 568	1 602 048	1 595 135	1 588 083	1 580 891	1 573 554	1 566 071	1 558 439	1 550 653	1 542 712
() Interest Expense		1 419 850	1 369 828	1 313 843	1 251 125	1 180 792	1 101 640	1 013 120	913 318	800 929	674 227	531 231	443 564	347 460	242 106	126 611	0	0	0	0	0
BEFORE TAX INCOME		22 404	98 719	149 032	205 966	270 398	407 874	490 255	583 795	689 798	809 986	946 337	1 158 484	1 247 675	1 345 978	1 454 280	1 573 554	1 566 071	1 558 439	1 550 653	1 542 712
() Income Tax 18% At r 15 Y t Tax Holiday		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	283 240	281 893	280 519	279 118	277 888
AFTER TAX INCOME		22 404	98 719	149 032	205 966	270 398	407 874	490 255	583 795	689 798	809 986	946 337	1 158 484	1 247 675	1 345 978	1 454 280	1 290 315	1 284 179	1 277 920	1 271 536	1 265 024
() Retained Income Distribution		11 202	49 359	74 516	102 983	135 199	203 837	245 127	291 898	344 899	404 993	473 169	579 242	623 837	672 989	727 140	645 157	642 089	638 960	635 768	632 512
NET RETAINED INCOME		11 202	49 359	74 516	102 983	135 199	203 837	245 127	291 898	344 899	404 993	473 169	579 242	623 837	672 989	727 140	645 157	642 089	638 960	635 768	632 512
Cumulative Earning – US\$		11 202	60 561	135 077	238 060	373 259	577 096	822 223	1 114 121	1 459 020	1 864 013	2 337 181	2 916 423	3 540 260	4 213 249	4 940 389	5 585 546	6 227 636	6 866 596	7 502 363	8 134 875

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HYPOTHETICAL SMALL HYDROPOWER PROJECT 10 MW

7 PROJECTED BALANCE SHEET

ITEM	YEAR														
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ASSETS															
Current Assets	1 476 192	2 615 981	3 707 795	4 764 580	5 616 375	6 429 758	7 131 566	7 743 948	8 255 506	8 653 263	8 922 428	9 582 672	10 093 772	10 513 323	10 832 521
Total Current Assets	1 476 192	2 615 981	3 707 795	4 764 580	5 616 375	6 429 758	7 131 566	7 743 948	8 255 506	8 653 263	8 922 428	9 582 672	10 093 772	10 513 323	10 832 521
Fixed Assets															
Fixed Assets in Operation	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900	19 220 900
() Cumulative Depreciation	1 281 393	2 582 787	3 844 180	5 125 573	-6 406 967	7 688 360	-8 969 753	10 251 147	11 532 540	12 813 933	14 095 327	15 376 720	16 658 113	17 939 507	19 220 900
Net Fixed Assets in Operation	17 939 507	16 658 113	15 376 720	14 095 327	12 813 933	11 532 540	10 251 147	8 969 753	7 688 360	6 406 967	5 125 573	3 844 180	2 562 787	1 281 393	0
Other Assets (IDC)	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955	2 753 955
() Amortization	183 597	367 194	550 791	734 388	917 985	1 101 582	1 285 179	1 468 776	1 652 373	1 835 970	2 019 567	2 203 164	2 386 761	2 570 358	2 753 955
Total Other Assets	2 570 358	2 386 761	2 203 164	2 019 567	1 835 970	1 652 373	1 468 776	1 285 179	1 101 582	917 985	734 388	550 791	367 194	183 597	0
TOTAL ASSETS	21 986 056	21 660 855	21 287 679	20 879 474	20 266 278	19 614 671	18 851 489	17 998 880	17 045 448	15 978 214	14 782 389	13 977 643	13 023 752	11 978 314	10 832 521
LIABILITIES & EQUITY															
Short Term Liabilities															
Current Debt Maturity	363 359	398 333	436 672	645 412	720 245	804 473	899 379	1 006 434	1 127 327	1 264 001	910 819	998 486	1 094 590	1 199 944	1 315 439
Total Short Term Liabilities	363 359	398 333	436 672	645 412	720 245	804 473	899 379	1 006 434	1 127 327	1 264 001	910 819	998 486	1 094 590	1 199 944	1 315 439
Long Term Liabilities															
Long Term Loan Balance	13 184 913	12 821 554	12 423 221	11 986 549	11 341 137	10 620 892	9 816 419	8 917 041	7 910 607	6 783 280	5 519 278	4 608 459	3 609 973	2 515 383	1 315 439
() Debt Service	363 359	398 333	-436 672	-645 412	720 245	-804 473	-899 379	1 006 434	1 127 327	1 264 001	910 819	998 486	1 094 590	1 199 944	1 315 439
Total Long Term Liabilities	12 821 554	12 423 221	11 986 549	11 341 137	10 620 892	9 816 419	8 917 041	7 910 607	6 783 280	5 519 278	4 608 459	3 609 973	2 515 383	1 315 439	0
TOTAL LIABILITIES	13 184 913	12 821 554	12 423 221	11 986 549	11 341 137	10 620 892	9 816 419	8 917 041	7 910 607	6 783 280	5 519 278	4 608 459	3 609 973	2 515 383	1 315 439
SHAREHOLDERS EQUITY															
Paid In Capital	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942	8 789 942
Retained Earnings	11 202	49 359	74 516	102 983	135 199	203 837	245 127	291 898	344 899	404 993	473 169	579 242	623 837	672 989	727 140
TOTAL EQUITY	8 801 144	8 839 301	8 864 458	8 892 925	8 925 141	8 993 779	9 035 069	9 081 839	9 134 841	9 194 935	9 263 110	9 369 184	9 413 779	9 462 931	9 517 082
TOTAL LIABILITIES & EQUITY	21 986 056	21 660 855	21 287 679	20 879 474	20 266 278	19 614 671	18 851 489	17 998 880	17 045 448	15 978 214	14 782 389	13 977 643	13 023 752	11 978 314	10 832 521
<i>Balance Sheet Check</i>	<i>0</i>														

EARNINGS BEFORE INCOME TAX	22 404	98 719	149 032	205 966	270 398	407 674	490 255	583 795	689 798	809 986	946 337	1 158 484	1 247 675	1 345 978	1 454 280
Interest Coverage	10	11	11	12	12	14	15	16	19	22	28	36	46	66	125
Total Debt Coverage After tax	16	17	17	15	15	16	16	15	15	15	20	21	21	21	21
Current Ratio	41	66	85	74	78	80	79	77	73	68	98	96	92	88	82
Debt/Equity Ratio	15	15	15	14	14	14	14	14	14	14	14	14	14	14	14
Debt as a Proportion of Debt + Equity	06	06	06	06	06	05	05	05	05	04	04	03	03	02	01

HYPOTHETICAL SMALL HYDROPOWER PROJECT

10 MW

8 SENSITIVITY ANALYSES -- FEASIBILITY INDICATORS

VARIABLE	VALUE	IRR	ROE Year 2	ROE Year 5	NI - Year 2	NI - Year 5	CR - Year 2	CR - Year 5	DC - Year 2	DC - Year 5
Investment Cost										
Base Case	\$19 220 900	3 0%	1 1%	3 0%	\$98 719	\$270 398	6 6	7 8	1 7	1 5
33% Above	25 563 797	1 1%	-7 4%	-5 3%	-836 711	602 710	4 1	5 1	1 2	1 2
33% Below	12 878 003	9 4%	16 1%	17 7%	1 034 208	1 143 506	11 5	13 2	2 5	2 3
Tariff to NEA										
Base Case	0 0413									
33% Above	0 0549	7 9%	12 4%	14 1%	1 160 360	1 332 040	7 9	8 5	2 3	2 1
67% Above	0 0690	12 2%	22 7%	24 3%	2 254 173	2 425 853	9 3	9 3	2 9	2 7
Interest Rate US\$ Denominated Loan										
Base Case	9 63%									
33% Above	12 80%	1 2%	-4 4%	2 3%	399 411	-206 786	7 7	8 7	1 4	1 3
33% Below	6 45%	4 7%	6 4%	8 0%	556 806	697 069	5 6	6 9	2 0	1 9
Interest Rate NPRs Denominated Loan										
Base Case	17 25%									
33% Above	22 94%	2 7%	0 2%	1 9%	13 802	164 784	6 4	8 0	1 6	1 5
33% Below	11 56%	3 2%	2 4%	10 0%	209 559	368 526	6 7	7 5	1 2	1 3

LEGEND

IRR	Internal Rate of Return of the Project After Tax
ROE	Rate of Return on Equity After Tax
NI	Net Income After Tax
CR	Current Ratio = Current Assets/Current Liabilities
DC	Debt Coverage = Net Cash Flow plus Interest Expense/Repayment of Long Term Debt plus Interest