

**Part A: Summary of Historical Financial flows and Benefit Redistributions of former Panguna mine**

**Table 1: Mineral production and financial data of Panguna Copper mine**

<b>Year</b>	<b>Copper (t'000'</b>	<b>Gold (Oz)</b>	<b>Silver (Oz)</b>	<b>Free Cash Flow (FCF)</b>	<b>Pre-tax CF</b>	<b>Post-tax CF</b>
<b>1971</b>				<b>-536</b>	<b>-536</b>	<b>-536</b>
1972	124	371,960	944,206	95.9	27.7	27.7
1973	182.9	638,892	1,395,050	252.4	158.7	158.4
1974	184.1	637,724	1,440,858	292.6	181.1	114.6
1975	172.5	565,336	1,316,028	183.1	58.6	46.2
1976	176.5	629,200	1,412,453	208.9	61.6	41.3
1977	182.3	694,969	1,474,177	205.3	42.2	28.5
1978	198.6	727,127	1,634,500	225.1	70	48
1979	170.8	612,807	1,387,452	343.1	161.8	83.9
1980	146.8	436,520	1,146,062	338.7	122.7	71.5
1981	165.4	523,440	1,317,564	296.4	43.4	22.8
1982	170	545,462	1,342,247	282.2	28.5	11.2
1983	183.2	560,555	1,473,685	392.9	101.5	54.6
1984	164.4	487,414	1,381,287	310.9	26.1	11.6
1985	175	446,921	1,434,853	317.6	47.1	28.1
1986	178.6	508,987	1,567,096	342.7	74	45.3
1987	178.7	469,793	1,573,262	415.4	144.2	93.6
1988	166	430,897	1,505,563	493.4	201.8	108.6
1989	68.7	209,552	644,023	231.6	5.1	-20.6
<b>Total</b>	<b>2,989</b>	<b>9,497,557</b>	<b>24,390,365</b>	<b>5,228</b>	<b>1,412</b>	<b>975</b>

*Source:* BCL Annual Report (2014), <https://www.bcl.com.pg/annual-report-2014-released/>

**Table 2: Indirect and non-tax benefits of former Panguna mine.**

	<b>Total (30-years)</b>	<b>Annual est.</b>	<b>PV@5%</b>
<b>Quasi-rents (local procurements)</b>			
Labour	956	50	52
Utilities	2105	31	54
Fixed Overheads	1542	45	65
Local contract value	1302	34	46
Materials & Supplies	1844	44	57
Other external services	61	2	2
<b>Total procurements (B)</b>	<b>6508</b>	<b>172</b>	<b>231</b>
<b>Social expenditures<sup>1</sup></b>			
Compensation (environment)	164	5.5	38
Mining lease and occupation fees	50	1.5	11.5
Tax credit scheme (TCS) (5% of CIT)	305	10.2	70.6
Special support grant (SSG) (0.25% GR)	147	4.9	34
<b>In-house and external training</b>			
Apprentice training	45	1.5	10.4
Tertiary scholarships	35	1.2	9.1
Education donations (materials, books)	9	0.3	2.1
<b>(C) Total</b>	<b>755</b>	<b>25.2</b>	<b>176.7</b>
<b>(D) Total indirect benefits (B +C)</b>	<b>7,263</b>	<b>242.1</b>	<b>1,680.5</b>
<b>Net benefits (A + D)</b>	<b>39,758</b>	<b>1,325.3</b>	<b>9,199</b>

<sup>1</sup> The social expenditures were estimated based on PNG's community incentive rates

**Table 3:** Summary of costs and benefits.

**Table 3:** Summary of costs and benefits of former Panguna Copper mine

ABG's net value	11,821
LOs net value	5,960
Direct tax revenue	12,633
Indirect tax revenue	2,081
Infrastructure expenditure	666
In-house and external training	89
Quasi-rents (local procurements)	6,508
<b>Total benefits</b>	<b>39,758</b>
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<b>Summary of all costs</b>	
Capital costs	6,806
Operation costs	31,632
Costs of biophysical impact & management	323
<b>Total (Net) Costs</b>	<b>31,955</b>

## Part B: Dynamic Cash Flow Model of Recommissioning the Panguna mine

**Table 1:** Results for 100% local ownership structure

<b>Input variables</b>	<b>Values</b>	<b>Input variables</b>	<b>Values</b>
Capital Cost (\$B)	5.8	Copper Production/Yr (t)	176667
Unit Operating Cost (\$/t)	10.9	Gold Production/Yr (Oz)	643333
Reserve (Mt)	1838	Revenue from Copper (\$M/Yr)	1060
Mine Life (Years)	30	Revenue from Gold (\$M/Yr)	933
Annual Throughput (Mt)	61	Total Revenue (\$M cu + \$M Au)	1784
Mill Recovery Rate	75%	Operating Cost (\$M/Yr)	512
Refinery Recovery Rate	85%	Royalty Rate	5%
Copper Grade	0.30%	Corporate Income Tax	35%
Gold Grade (g/t)	0.34	Discount rate	8%
Copper Content (Mt Cu)	5.3	Real discount rate	4.9%
Gold Content (Moz Au)	19.3	Inflation rate	3%
Copper Price (\$/t) (stochastic table used)	6000	Working capital (1% of capex) (US\$M)	58
Gold Price (\$/Oz)	1450	Salvage value ((2% of capex) (US\$M)	116
Copper Production/Yr (t)	176667		
Gold Production/Yr (Oz)	643333		
Revenue from Copper (\$M/Yr)	1060		
Revenue from Gold (\$M/Yr)	933		
Total Revenue (\$M cu + \$M Au)	1,993		
Operating Cost (\$M/Yr)	668		
<b>Fiscal Data</b>			
Royalty Rate	5%		
Corporate Income Tax	35%		
Discount Rate	8%		
Real discount rate	4.9%		
Inflation Rate	3%		



**Table 3: Results for 100% local ownership structure**

SCENARIO A: 100% LOCAL OWNERSHIP		
A. SUMMARY FOR 100% LOCAL OWNERSHIP		
	nom	AMOUNT
Copper metal recovered	tonnes	5,147,704
Gold metal recovered	Oz	23,290,752
Project Expenditure	US\$m	6806
Exploration	US\$m	500
Mining Project CapEx	US\$m	6,806
Mining Project OpEx	US\$m	31,632
Total Gross Revenue	US\$m	74,423
Export Revenue	US\$m	74,423
Foreign Partner Share	US\$m	-
State Partner Share	US\$m	-
Domestic Revenue (Undiscounted Economic Profit)	US\$m	21,445
Foreign Partner Share	US\$m	-
State Partner Share	US\$m	-
Other Income / By-Product Revenue	US\$m	-
Economic Profit (100% State-owned)	US\$m	21,445
Net Present Value (NPV)	US\$m	5,402
Internal Rate of Return	%	13%
Discounted Payback Period*	Years	9
Total Fiscal Revenue	US\$m	32,495
Total Direct Tax Revenue	US\$m	12,633
Indirect Tax Revenue (Employment, Excise/Duties)	US\$m	2,081
Non-Tax Revenue	US\$m	7,263
Royalty	US\$m	1,732
Production Levy	US\$m	x
Development Levy	US\$m	x
Mining Levy	US\$m	194
Corporate Income Tax	US\$m	6,264
Additional Profits Tax	US\$m	2,500
Dividend Withholding Tax	US\$m	1,943
Excise and duties	US\$m	287
Employee Payee tax	US\$m	287
Foreign Contractor Withholding Tax	US\$m	1,141
Local Contractor Tax	US\$m	189
Indirect benefits (Local procurements)	US\$m	6,508
<b>Net Benefits From Panguna Mine</b>	<b>US\$m</b>	<b>39758</b>

**Table 4: Results for 50% local ownership structure**

SCENARIO B: JV PARTNERSHIP WITH 50% FOREIGN INTEREST		
B. SUMMARY FOR FOREIGN PARTNER CASH FLOW (50%)		
	nom	AMOUNT
Copper metal recovered	tonnes	2,573,852
Gold metal recovered	Oz	11,645,376
Project Expenditure	US\$m	12947
Exploration	US\$m	385
Mining Project CapEx	US\$m	2901
Mining Project OpEx	US\$m	9661
Total Revenue	US\$m	37211
Export Revenue	US\$m	37211
Foreign Partner Share		50%
State Partner Share		50%
Foreign Economic Profit	US\$m	14,075
Net Present Value (NPV)	US\$m	2,819
Internal Rate of Return (IRR)		11%
Payback Period (Years)	Years	8
Royalty	US\$m	1,402
Production Levy	US\$m	x
Development Levy	US\$m	x
Mining Levy	US\$m	97
Corporate Income Tax	US\$m	4,242
Additional Profits Tax	US\$m	1,250
Dividend Withholding Tax	US\$m	972
Excise and duties	US\$m	144
Employee Payee tax	US\$m	144
Foreign Contractor Withholding Tax	US\$m	1,141
Local Contractor Tax	US\$m	-
Indirect benefits (Local procurements)	US\$m	3,254
<b>Net Benefits From Panguna Mine</b>	<b>US\$m</b>	<b>12,644</b>

**Table 5:** A 30% local JV ownership structure

SCENARIO C: JV PARTNERSHIP WITH 30% STATE (ABG) INTEREST		
C. SUMMARY FOR ABG's CASH FLOW (30%)		nom AMOUNT
Copper metal recovered	tonnes	1,544,311
Gold metal recovered	Oz	3,421,031
Project Expenditure	US\$m	7771
Exploration	US\$m	234
Mining Project CapEx	US\$m	1740
Mining Project OpEx	US\$m	5797
Total Revenue	US\$m	22327
Export Revenue	US\$m	22327
Foreign Partner Share		50%
State Partner Share		30%
State's Economic Profit	US\$m	12,050
Net Present Value (NPV)	US\$m	3,217
Internal Rate of Return (IRR)		15%
Payback Period (Years)	Years	10
Royalty	US\$m	841
Production Levy	US\$m	x
Development Levy	US\$m	x
Mining Levy	US\$m	58
Corporate Income Tax	US\$m	1,273
Additional Profits Tax	US\$m	750
Dividend Withholding Tax	US\$m	583
Excise and duties	US\$m	86
Employee Payee tax	US\$m	86
Foreign Contractor Withholding Tax	US\$m	-
Local Contractor Tax	US\$m	189
Indirect benefits (Local procurements)	US\$m	1,952
<b>Net Benefits From Panguna Mine</b>	<b>US\$m</b>	<b>5,818</b>

**Table 6:** Results for 20% landowner's equity interest benefits

SCENARIO D: JV PARTNERSHIP WITH 20% LANDOWNER INTEREST		
D. SUMMARY FOR LANDOWNER'S CASH FLOW (20%)		nom AMOUNT
Copper metal recovered	tonnes	1,029,541
Gold metal recovered	Oz	2,339,075
Project Expenditure	US\$m	5072
Exploration	US\$m	46.8
Mining Project CapEx	US\$m	1160
Mining Project OpEx	US\$m	3865
Total Revenue	US\$m	14885
Export Revenue	US\$m	14885
State Partner Share		30%
LO Partner Share		20%
Landowner's Economic Profit	US\$m	5,960
Net Present Value (NPV)	US\$m	1,424
Internal Rate of Return (IRR)		13%
Payback Period (Years)	Years	13
Royalty	US\$m	561
Production Levy	US\$m	x
Development Levy	US\$m	x
Mining Levy	US\$m	39
Corporate Income Tax	US\$m	848
Additional Profits Tax	US\$m	500
Dividend Withholding Tax	US\$m	389
Excise and duties	US\$m	57
Employee Payee tax	US\$m	57
Foreign Contractor Withholding Tax	US\$m	-
Local Contractor Tax	US\$m	189
Indirect benefits (Local procurements)	US\$m	1,302
<b>Net Benefits From Panguna Mine</b>	<b>US\$m</b>	<b>3,942</b>