

Chilean Copper Commission
Research Department

Investment in the Chilean Copper and Gold Mining Sector
Estimations for 2009-2013, Revised to March 2009
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Contents

I. Introduction	1
II. Estimates for 2009-2013	2
2.1 Investment Profiles.....	2
2.2 Project Startup Timeline	3
2.3 Revised Estimates	3
III. Copper Production Estimates, 2008-2015	5
3.1 Mine Production	5
3.2 Smelter and Refinery Production	6
3.3 Refined and Mine Production Ratios	6
IV. Leading Investment Projects	7
4.1. Codelco	7
4.2. Major Private Copper Miners	9
4.3. Medium-Scale Copper Mining	11
4.4 Gold and Silver Mining	12
ANNEX 1: METHODOLOGY	13

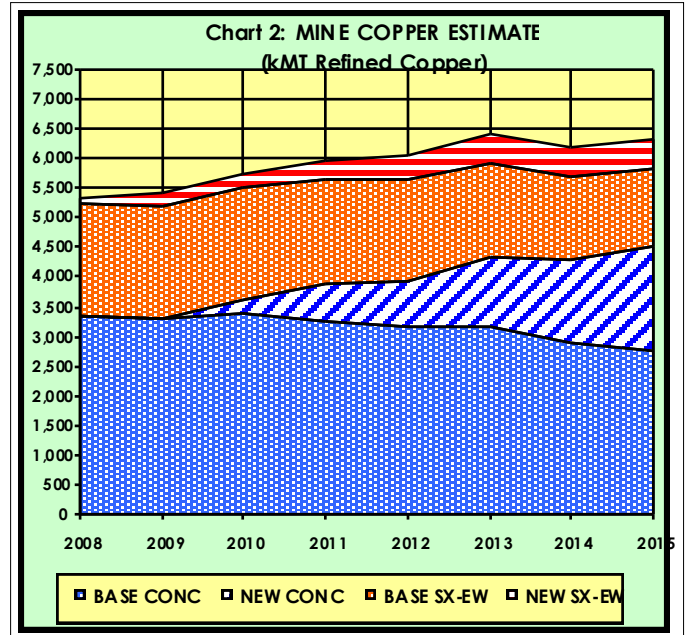
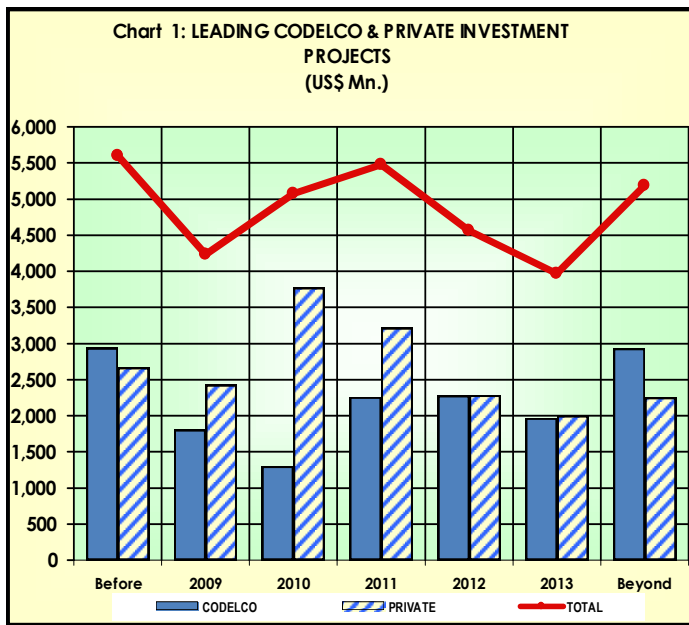
Investment in the Chilean Copper and Gold Mining Sector Estimations for 2009-2013, Revised to March 2008

I. Introduction

The purpose of this report is to estimate expected investments in the Chilean copper and gold/silver mining sectors and assess their impact on copper production. This series of ongoing reports reviews and interprets publicly available investment reports by key sector players. It is regularly updated to reflect significant new events.

This report has three parts:

- Estimated investments in 2009-2013 by both Codelco and private-sector copper, gold and silver miners, including startup timelines for leading projects.
- Estimated mine copper production (concentrate plus SX-EW cathodes) and smelter and refinery output for 2009-2015, using 2008 as baseline year.
- Brief description of leading investments under consideration.



Source: Cochilco, based on publicly available reports.

See methodology notes in Annex 1.

II. Estimates for 2009-2013

2.1 Investment Profiles

Planned investments in the Chilean copper and gold mining sector, including projects under construction and those likely to begin construction before 2013, are estimated to stand at US\$34.1 billion. This amount includes US\$30.2 billion in copper mining investments by Codelco (51.1%), large private miners (47.1%), and medium-scale miners (1.8 %).

Total expected investment by large gold miners stands at an estimated US\$3.8 billion.

US\$23.3 billion will be invested in 2009-2013 alone.¹ As shown on Table 1, Codelco and private copper miners plan to invest US\$9.6 and US\$10.8 billion, respectively. Gold and silver miners plan to invest a sizable US\$2.9 billion.

**Table 1: Expected Investment in the Copper and Gold/Silver Mining Sector
(US\$ Million)**

	Before	2008	2009	2010	2011	2012	2013	Total 09-13	After	Total
Total Investment (1 + 2)	2,868	2,732	4,234	5,074	5,477	4,566	3,969	23,319	5,182	34,101
1) Copper Mining (1.1 + 1.2 + 1.3)	2,579	2,702	4,114	4,524	4,977	3,831	2,969	20,769	4,582	30,277
1.1) Codelco	1,676	1,260	1,806	1,300	2,257	2,281	1,969	9,613	2,932	15,480
1.2) Large Private Miners	826	1,262	2,180	3,116	2,680	1,550	1,000	10,526	1,650	14,264
1.3) Medium-Scale Miners	77	180	127	108	40	0	0	275	0	532
2) Gold/Silver Mining	289	30	120	550	500	735	1,000	2,905	600	3,824

Source: Cochilco, based on public reports.

¹ Does not include investments prior to 2009 or beyond 2013.

2.2 Project Startup Timeline

Table 2 below shows leading projects scheduled for startup in 2008-2009 and beyond.

Table 2: Leading Project Startup Timeline

Startup	Company Name	Project Name	Amount (US\$ Million)
2008	ANTOFAGASTA MIN.	Los Pelambres (Mauro Tailings Dam)	534
	CODELCO-CHILE	Gabriela Mistral	1,269
	XSTRATA	Lomas Bayas Expansion	70
2009	CODELCO TENIENTE	Pilar Norte	136
	CENTENARIO COPPER	Franke	172
2010	ANTOFAGASTA MINERALS	Esperanza	1,900
		Los Pelambres (Expansion II)	600
	CODELCO ANDINA	94,000 TPD Expansion (Phase I)	989
	COLLAHUASI	Phase I Expansion	750
	TECK	Andacollo Hypogenic	336
2011	ANGLO AMERICAN	Los Bronces Expansion	1,740
	CERRO DOMINADOR	Diego de Almagro	120
	XSTRATA	Lomas Bayas II	200
2012	BARRICK	Pascua	1,500
	PAN PACIFIC COPPER	Caserones	1,700
2013	XSTRATA	El Morro	2,500
	CODELCO SALVADOR	San Antonio Oxides	230
	CODELCO NORTE	Ministro Hales Mine	1,729
2013 and beyond	BARRICK	Cerro Casale	2,324
	BHP BILLITON	Escondida Phase V	3,250
	CODELCO ANDINA	230,000 TPD Expansion (Phase II)	4,800
	CODELCO TENIENTE	New Mine Level	1,500

Source: Cochilco, based on public reports.

2.3 Revised Estimates

Investment and project startup estimations are based on data available to March 2009. While significant changes relative to our last report (August 2008) are shown, data used does not reflect the full impact of the global crisis and its ongoing effects on the economic activities driving copper and gold demand.

Note in particular that investment amounts may be cut and startup dates deferred. The information herein was compiled as investment decisions were being assiduously reassessed and should therefore be reviewed with caution.

Key changes relative to our August 2008 report include:

2.3.1 Codelco:

- a) Actual API² disbursements in 2008 were US\$1.2 billion rather than the US\$1.6 billion estimated in August 2008.
- b) Investment amounts in the Gaby Project were upgraded to US\$1.2 billion to accommodate a future capacity expansion.
- c) Investment in Andina Phase I was upgraded from US\$734 to US\$992 million while startup was moved from H2 2009 to mid-2010.
- d) For the Ministro Hales project, both mine development and its associated plants (US\$1.7 billion) were considered. Startup was deferred by one year to 2014.
- e) The Salvador Division's US\$230-million San Antonio Oxides Project was added. Estimated startup is 2013.

2.3.2 Private Copper Miners

- a) The Escondida Phase V Project was moved back an estimated two years. Investment amount rose from the US\$1 billion estimated in August 2008 to the US\$3.2 billion announced subsequently. The new desalination plant project was deferred and is not included.
- b) Per a recent Antofagasta Minerals announcement, the Antucoya Project (US\$200 million) was not included. Michilla will shut down in 2010.
- c) The Pan Pacific Copper Caserones Project was updated to reflect the new product mix, investment amount, and startup date (2012). Revised figures are US\$1.7 billion and 120,000 TPY copper concentrate plus 30,000 TPY SX-EW cathodes, up from the previously estimated US\$1.5 billion and 110,000 TPY SX-EW cathodes.
- d) Projects deferred an estimated one year include El Abra's Sulfolix, XSTRATA's El Morro, Vale's Tres Valles, and Cerro Dominador's Diego de Almagro. Investment amounts remain unchanged.
- e) While the Los Bronces Expansion Project should be delayed only by a few months, it is now expected to take longer to reach full capacity.

² Investment Project Authorization (API), a process evaluated jointly by Cochilco and the Ministry of Planning (MIDEPLAN). Does not include disbursements considered as investments by Codelco (i.e., deferred expenses and the like) which require no authorization.

2.3.3 Gold Mining

Barrick's Pascua and Cerro Casale projects are deferred by an estimated one year. Investment amounts remain unchanged.

III. Copper Production Estimates, 2008-2015

3.1 Mine Production³

Annual mine copper production is expected to stand at 6.33 million tons refined content by 2015, a 18.8 percent increase over the 5.33 million tons posted in 2008. Accounting for this are a 34.2 percent increase in concentrate production (sulfides line) and a 7.3 percent decline in SX-EW cathode production (hydrometallurgical line).

Both Chart 2 and Table 3 summarize expected mine copper production through 2015, relative to 2008. Estimates are based on existing production profiles plus new flows from planned operations in the period under review.

**Table 3: Expected Mine Copper Production Through 2015
(kMTF)**

Description	Type	2008	2009	2010	2011	2012	2013	2014	2015
Baseline Production	Concentrate	3,355	3,309	3,389	3,267	3,155	3,178	2,876	2,736
	SX-EW Cathodes	1,898	1,880	1,919	1,751	1,726	1,603	1,396	1,341
Total Baseline Production		5,253	5,189	5,308	5,018	4,881	4,781	4,272	4,077
New Production	Concentrate	1	2	207	620	765	1,150	1,404	1,767
	SX-EW Cathodes	76	216	235	348	400	475	512	488
Total New Production		77	218	442	968	1,165	1,625	1,916	2,255
Estimated Production	Concentrate	3,356	3,311	3,596	3,887	3,920	4,328	4,280	4,503
	SX-EW Cathodes	1,974	2,096	2,154	2,099	2,126	2,078	1,908	1,829
Total Estimated Production		5,330	5,407	5,750	5,986	6,046	6,406	6,188	6,332

Source: Cochilco estimates.

New mine copper production is expected to stand at 2.26 million tons refined copper (1.77 million tons concentrate and 0.49 million tons SX-EW cathodes). This more than offsets the 1.18-million ton production decline in existing operations expected by 2015.

³ Includes concentrate and SX-EW cathodes.

These revised expectations are the result of the investment changes reviewed in the preceding section.

3.2 Smelter and Refinery Production

Smelter and refinery output is expected to rise in 2009 following recent additions and operating improvements. Subsequent production is expected to remain stable through 2015.

Estimates do not include the Codelco Smelter and Refinery Project, currently being reviewed for consistency with mining investment plans and new market conditions.

Table 4 shows estimated smelter (anode & blister) production as well as electrolytic and fire-refined copper production.

Table 4: Expected Smelter and Refinery Production Through 2015
(kMTF)

	2008	2009	2010	2011	2012	2013	2014	2015
Total Smelter Output	1,561	1,838	1,829	1,823	1,680	1,899	1,859	1,920
Total Refinery Output	1,087	1,133	1,157	1,178	1,124	1,332	1,350	1,355

Source: Cochilco estimates.

In 2008, Chilean smelters were able to process 46.5 percent of local concentrate production. Expansions in capacity through 2009 should increase this figure to 55.5 percent, which would then decline to 42.6 percent by 2015 as concentrate production expands without a corresponding increase in smelting capacity.

Electrolytic and FR production capacity in the period should remain constant at around 30 percent.

3.3 Refined and Mine Production Ratios

Mine copper production (concentrate + SX-EW cathodes) converted into various commercial forms of refined copper (SX-EW cathodes + ER and FR cathodes) is shown on Table 5. The mine copper-refined product conversion ratio for 2008 stood at about 57.4 percent. This is expected to fall as more concentrate is processed abroad and hydrometallurgical production of SX-EW cathodes declines. The 2015 conversion ratio should stand at about 50 percent.

Table 5: Refined and Mine Copper Production Ratios Through 2015
(kMTF)

	2008	2009	2010	2011	2012	2013	2014	2015
1) Maximum Concentrate Production	3,356	3,311	3,596	3,887	3,920	4,328	4,280	4,503
2) Maximum SX-EW Cathode Production	1,974	2,096	2,154	2,099	2,126	2,078	1,908	1,829
3) Electrolytic and FR Capacity	1,087	1,133	1,157	1,178	1,124	1,332	1,350	1,355
Percent Cap. Ref. Production (2+3) / Mine Copper Production (1+2)	57.4	59.7	57.6	54.7	53.8	53.2	52.7	50.3

Source: Cochilco estimates.

IV. Leading Investment Projects

4.1. Codelco (www.codelco.cl)

GABRIELA MISTRAL (Minera Gaby)

A porphyry copper orebody containing oxidized ores underlying sulfide ores, Gaby stands on the Domeyko Mountain Range, 120 km from Calama near San Pedro de Atacama. Estimated reserves are 541 million tons leachable ores with 0.44 percent grades. Phase I production of 150,000 TPY SX-EW cathodes is operational since mid-2008. Phase II, intended to attain 165,000 TPY production throughout the life of the project, is now underway.

Est. Investment Amount: US\$1,269,000,000

Status: SX-EW cathode production underway since May 2008. Phase II studies in progress.

RADOMIRO TOMIC SULFIDES (Northern Codelco Division):

Involves initial development of sulfides surfacing at the Radomiro Tomic Mine as overlying oxides become depleted. Project calls for extraction and crushing of ores and subsequent transportation by conveyor belt to the Chuquicamata concentrating plant for production of an estimated 80,000 TPY of copper. Some sulfides from RT are already being trucked to Chuquicamata. Phase II, involving sulfide leaching and feeding to the SX-EW plant as oxides become depleted, is under review.

Est. Investment Amount: US\$400,000,000

Status: Work underway, expected operational in 2010.

MINISTRO HALES MINE DEVELOPMENT (Northern Codelco Division)

Halfway between Chuquicamata and Calama, the Ministro Hales Mine is a copper sulfide deposit with estimated reserves of 219 million tons and 1.13% average grades. Once fully operational, Ministro Hales should be able to process up to 50,000 TPD, helping the Northern Codelco Division maintain current processing levels and

contributing an extra 165,000-200,000 TPY copper concentrate. High arsenic levels will require a dedicated concentrating line and fluidized bed roasting prior to smelting.

Est. Investment Amount: US\$1,729,000,000

Status: Prefeasibility review. Mining and concentrate production expected to commence in 2010 and 2014, respectively.

SAN ANTONIO OXIDES (Salvador Division)

A project involving processing of oxidized ores leftover from underground development of the old Potrerillos Mine. Located 8 km SE of the Potrerillos Smelter at 3,200 m altitude, with 111 million tons estimated reserves. Plans include a crushing plant on the old mine site and hydrometallurgical (SX-EW) plants to be built in either Potrerillos or the old mine site. Production capacity is an estimated 25,000 TPY SX-EW cathodes through a period of 17 years.

Est. Investment Amount: US\$239,000,000

Status: Prefeasibility review. Mining and cathode production expected to commence in 2010 and 2013, respectively.

PHASE I: 94,000 TPD EXPANSION / ANDINA DEVELOPMENT PLAN (Andina Division)

Initial stage of Andina Division plans to upgrade mining and processing capacity to 94,000 TPD to compensate for declining grades. Includes a net 30,000 TPY copper concentrate production increase and linkup work for Phase II.

Est. Investment Amount: US\$992,000,000

Status: Under construction, expected operational in 2010.

PHASE II: 230,000 TPD EXPANSION / NUEVA ANDINA (Andina Division)

Phase II calls for upgrading mining and processing capacity from 94,000 TPD to 230,000 TPD. Includes developing a new open pit, continuing underground mining, and relocating processing plants to the valley. Phase II should contribute an additional 320,000 tons, for an overall output of 600,000 TPY refined copper in concentrate form.

Est. Investment Amount: US\$4,800,000,000 (includes US\$110 million for engineering studies).

Status: Prefeasibility stage, expected operational in 2015.

PILAR NORTE (Teniente Division)

Involves mining a section of the northern reserves in order to feed an extra 17,000 TPD to the concentrating plant.

Est. Investment Amount: US\$136,000,000

Status: Under construction, expected operational in 2009.

NEW MINE LEVEL (Teniente Division)

Includes all studies required to increase ore mining to 180,000 TPD and start development on a new mine level.

Est. Investment Amount: US\$1,500,000,000

Status: Prefeasibility studies underway.

4.2. Major Private Copper Miners

4.2.1 Anglo American (www.anglochile.cl)

Los Bronces Development (Anglo American Sur)

A project designed to increase ore processing capacity from 60,000 to 160,000 TPD, thereby adding some 175,000 TPY refined copper to the Los Bronces concentrate output. Includes a new crushing and milling line plus a conveyance system fitted with an additional slurry pipeline for transportation of thickened ores to higher-capacity copper and molybdenum concentrating plants located in the valley.

Est. Investment Amount: US\$1,740,000,000

Status: Basic engineering in progress. Expected operational in late 2011 following two years' construction.

4.2.2 Antofagasta Minerals (www.antofagasta.co.uk)

ESPERANZA (Antofagasta Minerals)

Orebody located 6 km southeast of the El Tesoro deposit in Sierra Gorda. Reserves are an estimated 786 million tons sulfides (0.53% copper and 0.2 GPT gold). Expected output is 195,000 TPY copper concentrate with a high gold content. Oxides might be integrated into the El Tesoro mining plan. Processing will use 640 l/sec. seawater and thickened tailings techniques.

Est. Investment Amount: US\$1,900,000,000

Status: Feasibility stage. Expected output is 195,000 TPY copper concentrate with a high gold content (200,000 oz.). Expected on stream in late 2010.

LOS PELAMBRES EXPANSION (Minera Los Pelambres)

Subsequent to an overhaul in early 2007, plans are underway to increase processing capacity from 144,000 to 175,000 TPD. Designed to compensate for declining grades, the upgrade is designed to increase molybdenum recovery and expand the copper concentrate output by 80,000 TPY to an overall 440,000 TPY. While the expansion is supported by an upgrade to El Mauro Tailings Dam capacity, current reserve levels do not suggest an extension in the life of mine.

Est. Investment Amount: US\$600,000,000

Status: Under review. Expected operational in 2010.

ANTUCOYA (Minera Michilla)

The Antucoya and nearby Buey Muerto orebodies, east of Antofagasta just south of SQM's Pedro de Valdivia nitrate plants, contain vast yet low-grade leachable copper resources. Intended as replacements for the Michilla orebody, which should become depleted in the immediate future.

Est. Investment Amount: US\$200,000,000

Status: Deferred.

4.2.3 BHP Billiton (www.bhpbilliton.com)

PHASE V EXPANSION (Minera Escondida)

Involves construction of a third concentrating plant to support increased processing and compensate for grade and concentrate output declines expected in coming years. The new plant will help produce an estimated 210,000 TPY copper concentrate.

Est. Investment Amount: US\$3,250,000,000

Status: Concept engineering; temporarily deferred. May be restarted within two years, but is not expected operational before 2015.

4.2.4 Doña Inés de Collahuasi (www.collahuasi.com)

COLLAHUASI EXPANSION (SCM Doña Inés de Collahuasi)

A project designed to expand the company's overall copper concentrate and SX-EW cathode output to 650,000 TPY based on increasing sulfide ore processing while retaining leachable ore processing capacities. Phase II will seek to bring the overall refined copper output up to 1 million tons.

Est. Investment Amount: US\$750,000,000

Status: Initial construction underway. Expected operational in 2010.

4.2.5 Pan Pacific Copper (www.ppcu.co.jp)

CASERONES (Minera Lumina Copper Chile)

Caserones (formerly Regalito) stands at 4,200 m altitude 115 km southeast of Copiapó, Atacama. Leachable reserves are estimated at 628 million tons with 0.43% copper grades. The presence of larger sulfide resources at a deeper level has led to reformulation of the project to limit leaching capacity to 30,000 TPY SX-EW cathodes and increase concentrating capacity to 120,000 TPY refined copper.

Est. Investment Amount: US\$1,700,000,000

Status: Under review; investment amounts and product mix may be revised. Expected operational in late 2011, if approved this year.

4.2.6 Teck (www.teckcominco.com)

ANDACOLLO SULFIDES (Minera Carmen de Andacollo)

A hypogenic primary sulfide deposit underlying secondary supergenic sulfide ores currently yielding 21,000 TPY SX-EW cathodes. Reserves are estimated at 429 million tons with 0.39% and 0.13 GPT average copper and gold grades, respectively; total resources are twice as large. A planned 55,000-TPD concentrating plant should help bring total production to 76,000 TPY copper and 53,000 oz. gold in concentrate form.

Est. Investment Amount: US\$410,000,000

Status: Under construction. Expected operational in 2010 as leachable ores become depleted.

4.2.7 Xstrata (www.xstrata.com)

LOMAS BAYAS EXPANSION (Minera Lomas Bayas)

A project designed to expand cathode production to 75,000 TPY. As the initial orebody becomes depleted, plans include mining a new pit 3 km from the current site, building a new heap leaching facility, and upgrading the existing plant infrastructure. The intent is to extend the life of mine through 2020 and maintain production in spite of declining grades.

Est. Investment Amount: US\$70,000,000 (Phase I)
US\$200,000,000 (Phase II)

Status: Phase I operational in late 2008. Phase II feasibility will be reviewed in 2009; expected operational in 2011.

EL MORRO (Xstrata & Metallica Resources)

An orebody 84 km east of Vallenar (Alto del Carmen, Atacama). Reserves are an estimated 487 million tons sulfides (0.56% copper and 0.44 GPT gold). Production should stand at some 195,000 TPY copper concentrate with high gold content (353,000 oz.) through an estimated life-of-mine of 15 years.

Est. Investment Amount: US\$2,500,000,000

Status: Feasibility completed but no decision has been made. Concentrate production not expected before 2013.

4.3. Medium-Scale Copper Mining

4.3.1 Centenario Copper Corp. (www.centenariocopper.cl)

FRANKE (Centenario Copper Chile SCM)

An orebody of southern Antofagasta, within the Salvador Division area of influence. Estimated resources are 34 million tons leachable oxides and sulfides capable of producing 30,000 TPY SX-EW cathodes. Possible medium-term expansion as new reserves are added.

Est. Investment Amount: US\$172,000,000

Status: Under construction; expected operational in H1 2009.

4.3.2 Cerro Dominador (www.elbronce.cl)

DIEGO DE ALMAGRO (Minera El Bronce)

An IOCG (iron oxide-copper-gold) deposit in Atacama, 10 km from Diego de Almagro, with reserves estimated at 300,000 tons copper and 27,000 oz. gold. Plans include leaching oxides and concentrating sulfides to produce 11,000 TPY SX-EW cathodes (years 1-8) and 22,000 TPY copper concentrate (years 2-8).

Est. Investment Amount: US\$120,000,000

Status: Feasibility stage. Not expected operational before 2011.

4.3.3 ENAMI (www.enami.cl)

DELTA PROJECT

Involves development of the Panulcillo Mine near the city of Ovalle, with 50,000 TPM sulfide ore processing by a planned 60,000 TPM concentrating plant. Plant capacity will be completed with ores from local miners. While the mine is owned by Enami, development will be contracted out to the private sector. Plans also contemplate an oxides project, with Enami to build leaching/SX-EW facilities processing ores supplied by Enami leaseholders.

Est. Investment Amount: US\$6,400,000 (Panulcillo Mine)
 US\$44,100,000 (Flotation plant)
 US\$7,000,000 (Oxides Project)

Status: Under development.

4.4 Gold and Silver Mining

Barrick Gold (www.barrick.com)

PASCUA (Cía. Minera Nevada S.A.)

A gold deposit standing at 4,600 m altitude 53 km north of the El Indio Mine, Pascua forms a single unit with the Lama deposit on the Argentine side of the border. Global reserves are estimated at 17.1 million oz. gold and 560 million oz. silver, mostly oxides. Three-fourths of reserves lie in Chile (Pascua) and the remainder in Argentina (Lama). An agitation cyaniding plant will be built in the Lama area. Annual production is estimated at 24.9 tons of gold and 1,088 tons of silver.

Est. Investment Amount: US\$1,500,000,000 (50 percent of Chile budget)

Status: Construction approved, although a 2009 start date is contingent on the outcome of binational talks. Not expected operational before 2012.

CERRO CASALE (Minera Estrella de Oro Ltda.)

A gold and copper sulfide orebody in Aldebaran, on the southern end of the Maricunga gold district, 100 km due east of the city of Copiapó. Probable reserves are 507 million tons (0.69 GPT gold and 0.25% copper content) plus resources estimated at 187 million tons (0.4 GPT gold and 0.24% copper content). Project contemplates co-production of an estimated 30 TPY gold and 125,000 TPY copper concentrate.

Est. Investment Amount: US\$2,324,000

Status: Barrick took over the project (51 percent) following its December 2007 Arizona Star acquisition. Remaining 49 percent stake is owned by Kinross, which has kept the feasibility study up to date. Due to frequent ownership changes, however, construction is not expected to start before 2010. Startup is not expected before 2014.

ANNEX 1 METHODOLOGY

Below is an explanation of the methodology used to draft this report.

1. Scope

The report covers current and planned investments in 2009-2013 by both Codelco and medium- and large-scale private miners.

Investment estimates are allocated on a per-annum basis. Also shown are actual investments made through 2007 and 2008 in connection to ongoing projects with a commencement date prior to 2009.

Investments in connection with projects with an estimated commencement date beyond 2013 are identified as such.

Project particulars are complemented by estimations on additional copper production contributed, if any, plus notes on current status.

Information is provided on a best-guess basis, based on data current at the time of writing. When no such data is available, annual investment allocations are estimates not necessarily supported in sources.

As such, companies are not in any way responsible for the forecasts made in this report.

2. Codelco Investment Plans - Sources of Information

While most Codelco investments involve projects yielding a return, the company also invests in equipment replacement, facility upgrades, mining exploration, R&D, feasibility studies, environmental cleanup, workplace safety, and employee benefits.

Codelco investment estimates are based only on company submissions to the Investment Project Authorization (API) process evaluated jointly by Cochilco and the Ministry of Planning (MIDEPLAN).

These estimates are based primarily on reports submitted on a regular basis to the Cochilco Strategic Management Assessment Division. These reports have been used to assemble a conservative global investment profile. Details shown about key projects are a matter of public record.

Estimates presented here are based on the following sources:

- a) Investments for 2008 as shown on the *Codelco Investment Program – Physical Expenditure Advances Report to December 2008* describing annual budget implementation.
- b) Investments estimates for 2009, based on global approved investment amounts for the year. Specific amounts attributed to each project are unofficial estimates.
- c) Investment figures for 2010 and beyond are global estimates based on the *Codelco 2008 Business and Development Plan* and divisional estimates submitted to Cochilco.

Investment amounts and timelines are Cochilco Research Department estimates based on available information and our best knowledge. Codelco and the government agencies involved in authorizing investments are not in any way responsible for these estimates.

3. Private Copper and Gold Mining Investment - Sources of Information

Sources include public reports and announcements culled from company web sites, the news media, trade publications, and the like. Unlike Codelco, routine or exploration investments are not included.

Often only a global investment amount and intended commencement year are known. In such cases, annual allocations are estimated assuming a 30-month completion timeframe for complex projects and generally assigning about half of the investment amount to year two.

Information is shown on a per-company basis, grouping projects by location and majority- or wholly-owned subsidiary.

Enami investment amounts are shown under medium-scale private mining activities since the Enami mandate is directly connected to this sector. In addition, Enami's Delta Project is contingent on private investment.

It should be recalled that the global crisis affecting financial and especially metals markets is likely to continue impacting investment amounts and project schedules. Where available, company reports in this connection have been noted.

4. Copper Production

Information shown includes concentrate and SX-EW cathode production from mine sources, blister/anode production from smelters, electrolytic production from refineries, and FR production from smelters. All figures are shown as refined copper content relative to 2008, based on data available to the Cochilco Research Department.

Mine production estimates for 2009-2015 are based on profiles for both existing (Baseline Production) and planned (New Production) operations shown in this report.

Mine production is computed on a per-company basis for the year shown. Company information is included for reference only and is intended to account for changes in production profiles due to depletion of current operations and/or increases following startup of new projects. Companies are not in any way responsible for this information.

Smelter and refinery output estimated through 2015 does not include profile changes arising from investment projects not shown here.

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