

# The economic contribution of large-scale gold mining in Peru



## About the World Gold Council

The World Gold Council is the market development organisation for the gold industry. Working within the investment, jewellery and technology sectors, as well as engaging in government affairs, our purpose is to provide industry leadership, whilst stimulating and sustaining demand for gold.

We develop gold-backed solutions, services and markets, based on true market insight. As a result, we create structural shifts in demand for gold across key market sectors.

We provide insights into the international gold markets, helping people to better understand the wealth preservation qualities of gold and its role in meeting the social and environmental needs of society.

Based in the UK, with operations in India, the Far East, Europe and the US, the World Gold Council is an association whose members include the world's leading and most forward thinking gold mining companies.

The World Gold Council has 22 members representing approximately 60% of global corporate gold production. Members' active support of the World Gold Council represents their shared vision of ensuring a sustainable gold mining industry, based on a deeper understanding of gold's role in society, now and in the future.

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# Executive summary

## Large-scale mining often has significant impacts on the economies of developing countries.

At the macroeconomic level, these are measured as increases in foreign direct investment (FDI) and currency reserves, boosts for government revenues, national income contribution, job creation and poverty alleviation, as well as creating potential for raising exchange rates (which may impact on the competitiveness of other sectors). Local impacts are experienced through these quantitative indicators, as well as through marked changes in patterns of life for local residents. These changes may include new opportunities for jobs, improved infrastructure, clinics and schools, but can also trigger significant in-migration of people in search of economic opportunities, disruption of traditional social structures and local increases in the price of land and food.

For Peru, the focus of this study, large-scale mining plays a key role in the economy – at both the national and local level. Nationally, the sector accounted for 60% or US\$16.3 billion of Peru's total export revenues in 2009. With regard to gold mining specifically, exports totalled US\$5.6 billion in 2008, of which almost 60% came from the four sample mines in this study.

In terms of employment, the importance of mining jobs differs from those in other sectors. In 2008, for example, jobs in the formal, or large-scale, mining sector equated to just 1.2% (compared with 40% for agriculture) of total employment in Peru. But the average skill set and therefore income of a mining industry worker (in the formal mining sector) far exceeds that of an agricultural worker. Additionally, it is estimated that sub-employment (covering underpaid, underemployed or unemployed conditions) in mining is only 16%, compared to 65% in agriculture. Such differences mean that mining employment can facilitate other economic activities. By contrast, agricultural employment, for example, has a much lower multiplier effect.

In terms of exports, mining has consistently represented between 40% and 60% of Peru's total earnings over the last three decades. The sector has been one of the largest taxpayers in the country throughout the last decade – representing 25% of total government revenues at its peak in 2007. While in recent years these revenues have grown in absolute terms, so have those from other sectors, decreasing the proportion from mining – a positive indication for economic sustainability.

Looking at gold mining specifically, and exclusively at the four World Gold Council member company mines used as the sample for this study, these mines alone represented over 20% of total mining exports and 12% of total exports from Peru in 2009. This means that more than one in every 10 dollars earned from exports came from these four mines. The sample mines' contribution to FDI<sup>1</sup> reached nearly 10% of Peru's total, and in its peak years, the sample's total expenditure exceeded US\$1.2 billion, making this group of mines a significant contributor to foreign exchange reserves in its own right.

The local impacts of the sample mines are equally significant. These include employment, procurement from local suppliers, community contributions, infrastructure improvements and taxes paid. The four mines' aggregate employment level is set to peak in 2011 at 5,000 workers, with a full 99% being Peruvian nationals. Of the US\$250 million in salaries expected to be paid in the peak years of 2011-2014, community salaries account for more than US\$100 million – a significant boost to the local and regional economies. Based on the multiplier used for this study, we estimate that the indirect job creation impact of the four mines from 2005 to 2014 to be approximately 8,000 additional jobs annually.

In terms of local procurement, the four mines' expenditure with national suppliers averaged 90% of their total procurement or nearly US\$1.4 billion per year from 2007 to 2010. In some years, this exceeds twice the total of all taxes paid by these mines and, in turn, generates additional revenues for government. The local effects of this expenditure are just as noteworthy, with 41% of all purchases from national suppliers going to community-based firms (or some US\$70 million) for 2010. In the context of most extractive industries, these are relatively high figures, and most likely reflect the maturity of local suppliers in these regions of Peru.

As mentioned, while noteworthy, these indicators do not capture the impacts of the four mines on the individuals and families of the regions studied. Interviews yielded claims of new jobs representing dreams come true: owners of local suppliers to the mines reported being able to send their children to university for the first time, while local companies were able to lift the standard of living of entire communities by way of employment and training. With at least several decades of planned large-scale mining activity in these regions, these mining-related jobs and businesses will result in sustainable development. In addition, the follow-on and supply chain effects of the mining and supplier operations, as well as consumption by employees in the local economies, should have similar if not more pronounced effects.

<sup>1</sup> FDI, strictly calculated, would include neither the investment by Buenaventura (a Peruvian company) nor the portions of investments in other mines attributed to their minority Peruvian ownership stakes, but has been used here as a proxy for FDI given the overwhelming majority of foreign ownership within the sample.

# Introduction

This report is the third in a series produced by the World Gold Council which investigates various topics in the sustainability of large-scale gold mining. The first appeared in December 2008, *Safeguarding Workplace and Community Health: how gold mining companies are fighting HIV/AIDS, tuberculosis and malaria*. The second, *The Golden Building Block: gold mining and the transformation of developing economies*, was published in September 2009.

## Background

Like *The Golden Building Block*, which employed a life-cycle assessment (LCA) to determine the effects of a representative sample of large gold mines on the national economy of Tanzania, this report applies the LCA methodology to the effects of gold mining on Peru's economy. However, it differs from the Tanzania report in several key aspects. First, considerably less data was available for this study. While the Tanzania study covered some 40 years, the current study covers 14 years. This is due to the fact that changes in corporate accounting systems and other factors made the collection of internal data impossible in certain periods. In addition, while large-scale gold mining is a relatively recent activity in Tanzania, beginning in 1994, Peru's economy has been closely linked to mining for literally centuries. Last, in the Tanzania LCA, we focused solely on national economic indicators, while this study includes an additional emphasis on the local economic impacts in the host regions of the mines in our sample.

## Methodology

The World Gold Council collaborated on this study with Oxford Policy Management (OPM). The study rests on two streams of research and analysis: the quantitative data capture and analysis on one hand, and the on-the-ground interviews in Peru on the other. After the OPM team designed the data collection template (Appendix) to gather internal figures (in aggregate, to preserve the internal, confidential data disclosed by each company), World Gold Council Sustainability Advisor Maureen Upton conducted on-the-ground research in Peru including interviews with numerous gold mining company representatives as well as local suppliers. To author this study, she collected and aggregated the company data for analysis by OPM, and then drew extensively on OPM's findings, which included not only the data analysis but also Peru's historical and economic background.

World Gold Council members Newmont Mining Corporation, Barrick Gold Corporation, Gold Fields Limited and Compañía de Minas Buenaventura participated in this study (Table 1).

**Table 1: Participating companies and mines**

Company (controlling interest/operator)	Mine	Region	2009 Production (000 Au oz)
Newmont	Yanacocha	Cajamarca	1,057
Barrick	Lagunas Norte	La Libertad	1,000
Gold Fields	Cerro Corona	Cajamarca	394
Buenaventura	Orcopampa	Arequipa	279

**Chart 1: Sample gold mines**



It is essential to emphasise that the findings of our research are based on the data available from these four mines in our sample only, and do not reflect either future expansions of the existing mines, or new projects currently underway or planned for the future. This explains why the findings show a dramatic decline in future gold mining activity – all mines eventually wind down and close, after all. One estimate of new mining investment – for all commodities – in the Cajamarca region alone (home to both Newmont’s Yanacocha and Gold Fields’ Cerro Corona) was US\$26 billion over the next eight to ten years. Given recent gold prices, one might assume that, subject to regulatory approvals, the mine plans could be extended and exploration near currently operating sites expanded, thus extending the operating period of any given mine by years if not decades. We are of course not in a position to make such predictions, but past history suggests that such assumptions are not unreasonable.

# Part I: Peru – economy, history and mining industry

In the 19th to mid-20th century, most of the Peruvian population made a living through agriculture. These primary goods drove exports as well, although foreign investment played a key role in the extraction of gold and silver for export during this period.

## Brief economic history of Peru

As shown in Chart 2, Peru was one of Latin America's economic stars from the 1950s to the 1970s, enjoying generally high rates of growth. After this period, however, the nation had one of the most deeply troubled economies in the region.

The high rates of poverty and income disparity, which have characterised Peru throughout its modern history, worsened in the 1980s. This was due in part to the population's growth outpacing economic opportunities, as well as the decreasing ratio of arable land to population size. By the 1960s these conditions contributed to increasing public criticism of foreign ownership and the nationalisation of several of the largest companies, a highly restrictive legislative environment and a more active role for the government, now the Velasco administration, in the economy. The result was low levels of new foreign investment throughout the 1980s.

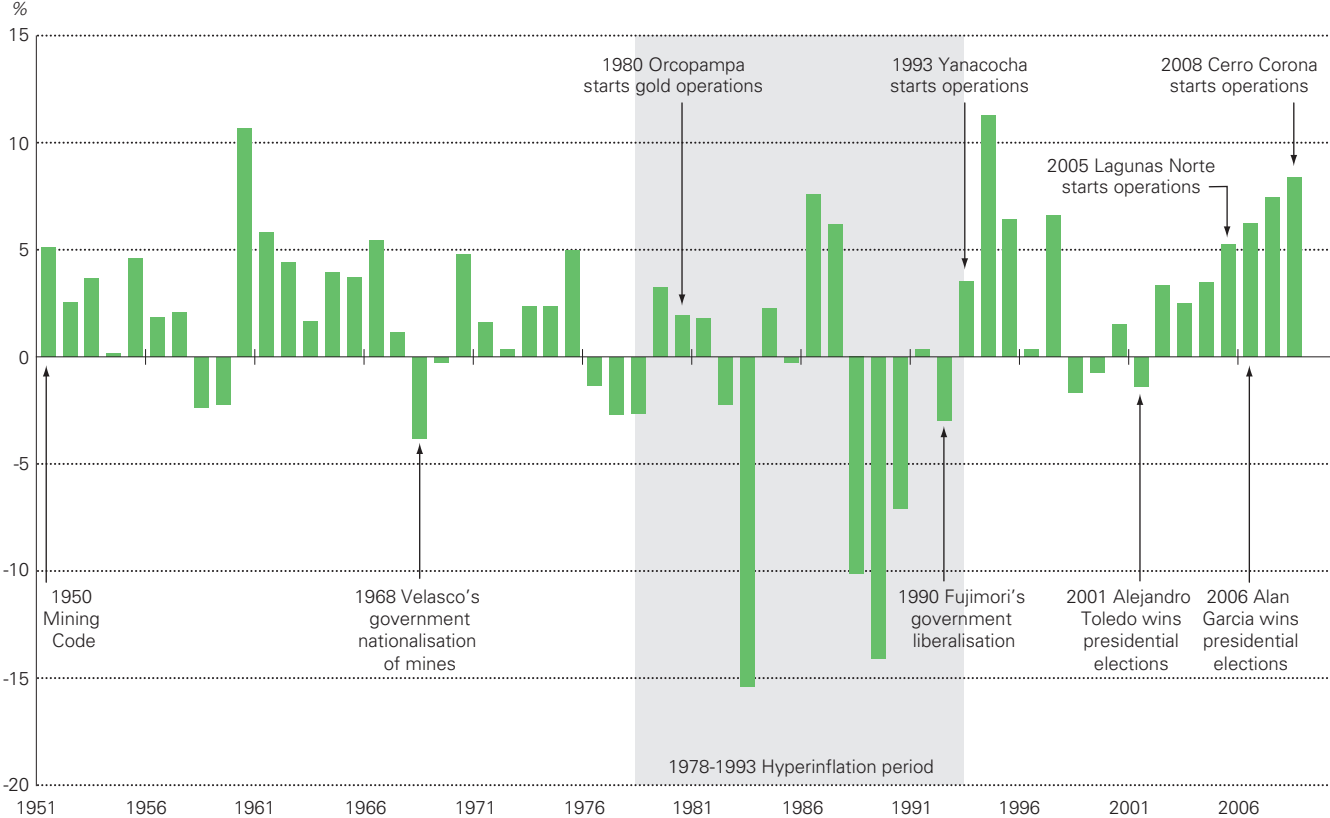
Following zero growth in output per capita in the period 1965 to 1988, performance actually dipped below 1965 levels in 1989 and 1990. At the same time, inflation went from moderate to high, a chronic deficit in the balance of payments developed, and Peru fell deeply into external debt.

Between 1980 and 1985, the Belaunde administration became unable to meet scheduled debt payments, with the result that the subsequent Garcia administration (1985-90) imposed a limit on debt payments to 10% of export earnings. From this point, foreign credit all but disappeared.

The Fujimori administration sought to tackle a nexus of challenges including falling national output and income, high unemployment, worsening poverty and violence, accelerating inflation and deep external debt. In response, the government put in place a drastic stabilisation programme starting with a concerted attack on inflation. While inflation was brought under control (though not without a severe economic shock), the economy showed few signs of recovery. In parallel, the high levels of violence associated with the Shining Path insurgency were brought under control, aided by state programmes directed at improving infrastructure and aiding some of the poorest parts of the country.

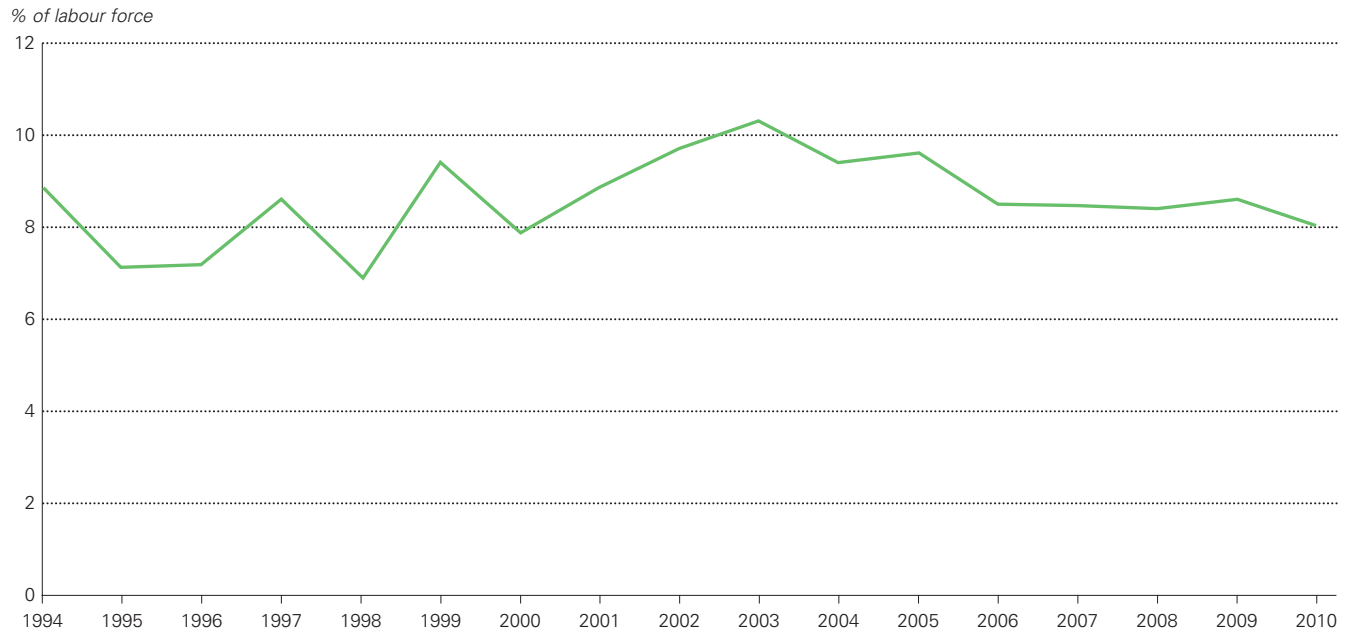
A new attitude was forged toward foreign investment and corresponding measures were introduced to open the economy. While some investors responded rapidly, the state of the economy combined with the incidence of violence continued to discourage FDI.

**Chart 2: Peru's GDP growth per capita, 1951 to 2008**



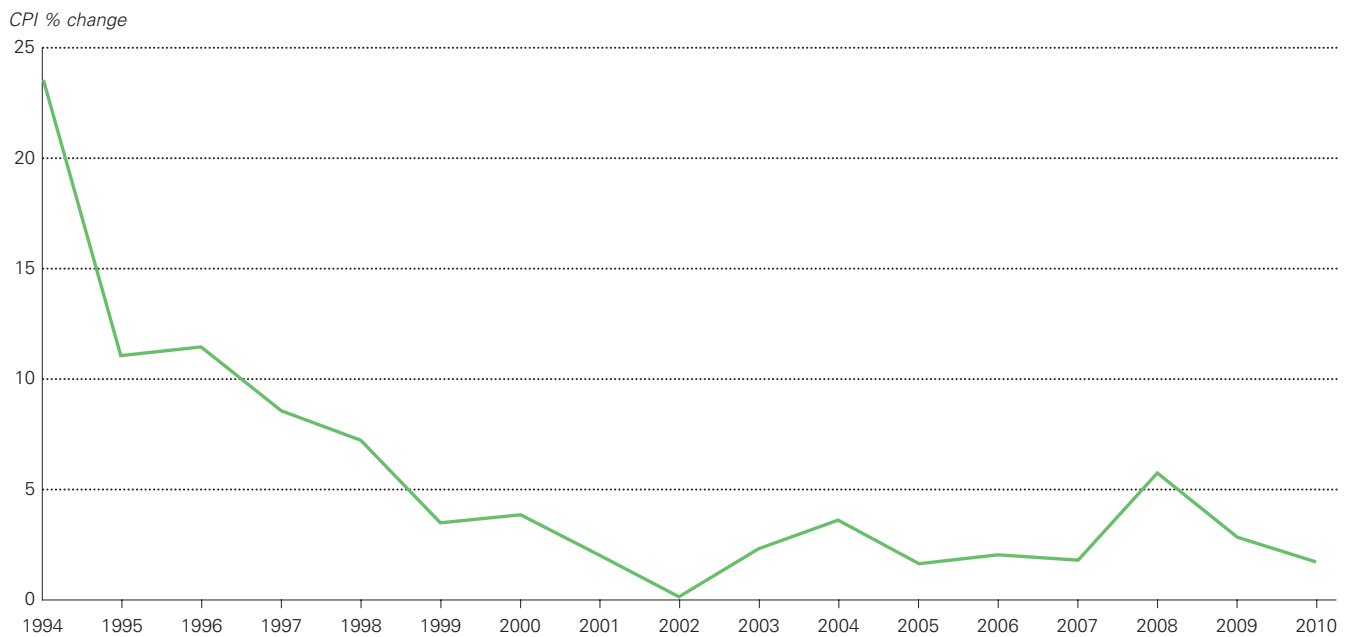
Source: Maddison (2010)

**Chart 3: Persistent unemployment, 1994 to 2010 (% of labour force)**



Source: International Monetary Fund, World Economic Outlook Database, October 2010

**Chart 4: Falling and stabilising inflation, 1994 to 2010 (CPI % change)**



Source: International Monetary Fund, World Economic Outlook Database, October 2010



## Recent economic growth

With the exception of 2009, Peru's strong economic growth over the last decade has made it one of the best performers in Latin America. Inflation has been stable, and GDP has grown significantly amidst a generally positive macroeconomic backdrop. Unemployment, however, has remained high with little improvement for the last 15 years (Chart 3). In this period, GDP has posted gains of 65%, and the economic growth between 1991 and 1997 helped to drive down the poverty rate by several points. The recession of 1998-2001 set the economy back considerably, but growth has been sustained since 2001 and appears to be on track to continue over the next several years.

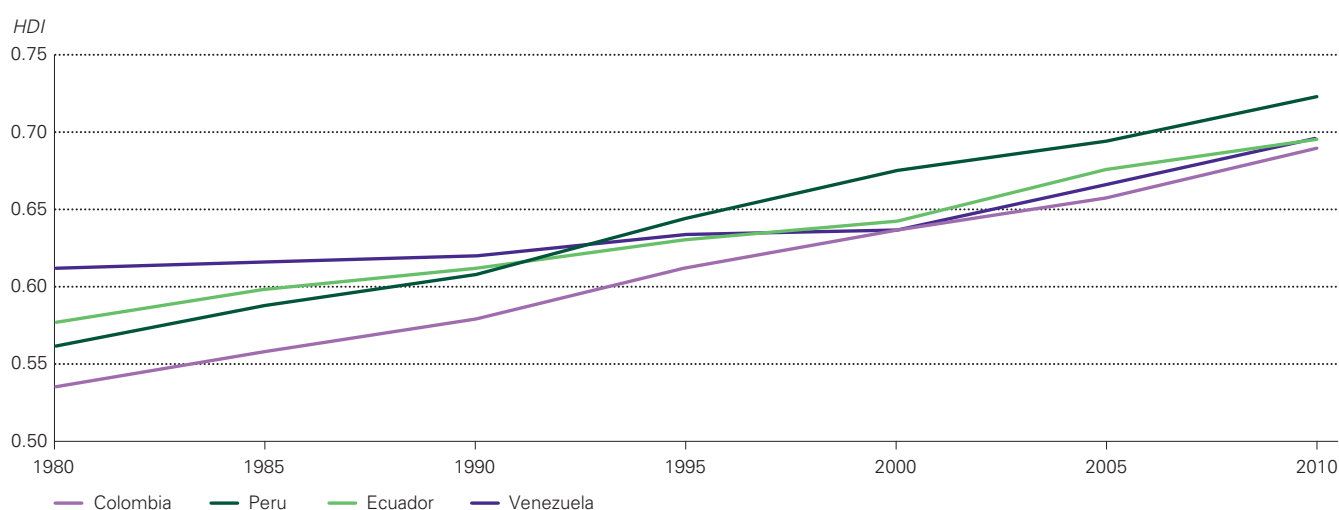
Inflation, however, presents a better picture, having remained in single digits since 1997 (Chart 4). This is in stark contrast to the period between 1978 and 1993 when it never dipped below 50%, peaking at 7,482% in 1990 when Fujimori's stabilisation programme was introduced. Since 1999, inflation has stayed below 5%.

## Social development and poverty alleviation

In recent years, Peru has posted stronger results in the fight against poverty than any of its neighbours, rising to 63rd out of 160 countries (moving up four positions) in the last five years (Chart 5).

Nevertheless, over half of Peru's population still lives below the poverty line, a higher proportion than its neighbours. While mining revenues to the government, reaching 11% of the total in 2009, are a significant contribution to the national economy, they don't appear to have translated into additional poverty reduction programmes, at the national level (see Part II for local economic impacts). In terms of Human Development Index (HDI) ranking, only Chile and Mexico currently top Peru's position in the region (Table 2).

**Chart 5: Outpacing the neighbourhood – Peru's fight against inflation 1980 to 2010 (Human Development Index)**



Source: UNDP, Human Development Index (2010), <http://hdr.undp.org/en/statistics/mpi/>

**Table 2: HDI components in 2010**

	HDI rank	Life expectancy at birth (years)	Mean years of schooling (years)	Expected years of schooling (years)	Gross national income (GNI) per capita (PPP* US\$ 2008)
Chile	45	78.8	9.7	14.5	13,561
Mexico	56	76.7	8.7	13.4	13,971
<b>Peru</b>	<b>63</b>	<b>73.7</b>	<b>9.6</b>	<b>13.8</b>	<b>8,424</b>
Brazil	73	72.9	7.2	13.8	10,607
Venezuela	75	74.2	6.2	14.2	11,846
Ecuador	77	75.4	7.6	13.3	7,931
Colombia	79	73.4	7.4	13.3	8,589
Bolivia	95	66.3	9.2	13.7	4,357

\*Purchasing power parity

Source: UNDP, Multidimensional Poverty Index (2010), <http://hdr.undp.org/en/statistics/mpi/>

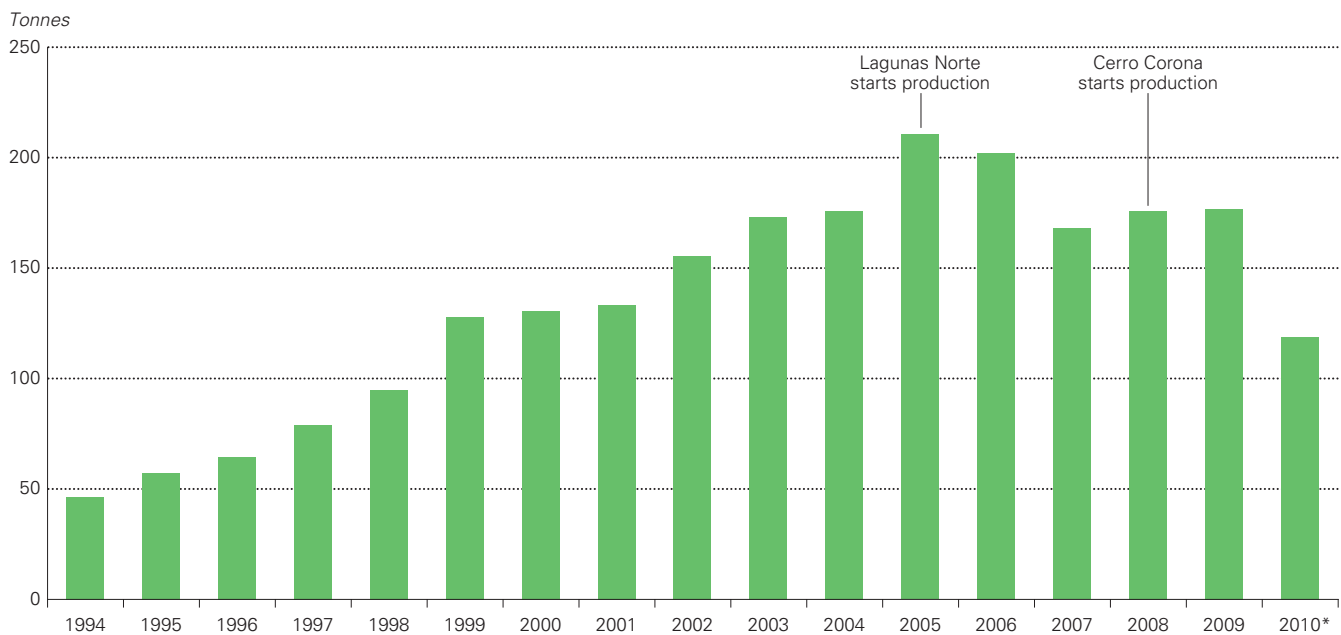
**Chart 6: Inconclusive results – variations in GDP, mining GDP and HDI, 1985 to 2010**



Note: GDP figures for the last tranche are changes for 4 years while HDI is for 5 years.

Source: HDI and BCRP

**Chart 7: Gold production 1994 to 2010 (in tonnes)**



\*2010 figure includes only the first nine months

Source: Instituto Nacional de Estadística e Información, Gobierno de Perú. <http://www.inei.gob.pe/>

As OPM notes, when comparing the variations in Peru's GDP, GDP from mining and changes in HDI, it is not possible to establish a correlation between them (Chart 6). Since 1980, HDI performance increased steadily, while both aggregate GDP and mining sector GDP varied widely. In 1990 for example, although aggregate and mining GDP decreased significantly, HDI increased from 0.588 to 0.608 (in the period 1985 to 1990). Also, from 2000 to 2005, when the highest GDP growth rate was registered, HDI showed the smallest gains compared with other five-year periods.

## Brief history of mining in Peru

Gold has played a pivotal role in Peru's economy for centuries. It has been an important source of wealth since the pre-colonial Inca civilisation. As an important economic activity in Peru before, during and after colonisation, the overall mining industry developed as an export sector and has consistently been a leading provider of foreign exchange and tax revenues. Mainly owned by foreigners, and having little relation to the domestic economy for its supplies and markets, mining was at the centre of the debate over dependency, perceptions of exploitation and foreign investment. With the Mining Code enacted in 1950, rules for private investment were established which opened the door to increased foreign participation, and many mines started operations.

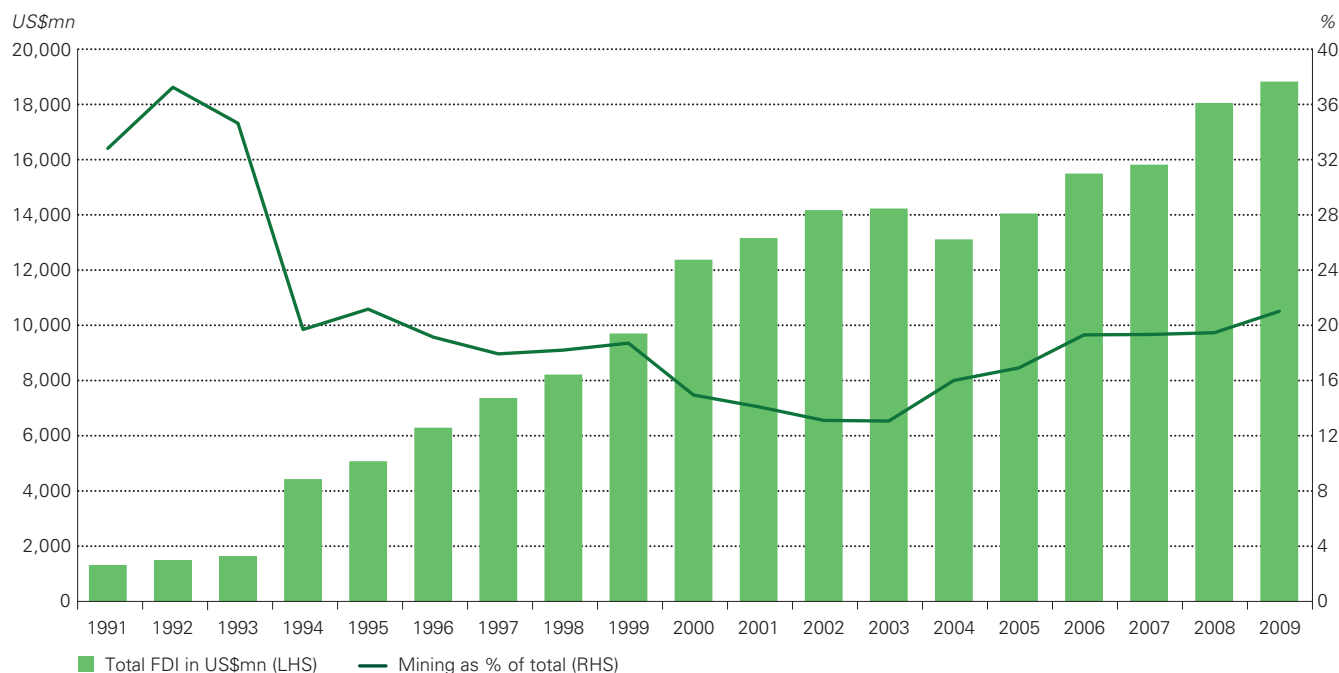
From 1950 to 1968, mining exports rose by an order of magnitude, from US\$45 million to US\$454 million. The 1970s brought nationalisation to Peru's extractive industries, with both the International Petroleum Company, which dominated the Peruvian oil industry, and the largest copper mining company, Cerro de Pasco, brought under state control.

As the economic and political turmoil of the 1980s took its toll, guerilla violence and strikes disrupted supply chains to the mines. Nationally, GDP in 1988 was 14% below 1980 levels. Throughout the decade, however, the state ownership structure of the mining sector remained in place. With the start of Fujimori's presidency in the early 1990s, nearly all of the state's mining enterprises were privatised, with foreign direct investment and private sector participation in general being actively encouraged. Total investment in the mining sector from 1992 and 2004 reached US\$9.8 billion, with gold production increasing fourfold between 1994 and 2005.

### Mining and FDI

In terms of FDI, the proportion of mining investment to overall FDI is relatively small, showing that foreign investment in Peru is well-diversified and not overly dependent upon mining. Mining FDI averaged 19% of the total from 2006 to 2010 (Chart 8), up from 14% in the period 2000 to 2004.

**Chart 8: Total and mining foreign direct investment 1991 to 2009**



Source: Proinversión, Agencia de Promoción de la Inversión Privada, Perú  
<http://www.proinversion.gob.pe/0/0/modulos/JER/PlantillaStandard.aspx?ARE=0&PFL=0&JER=1744>

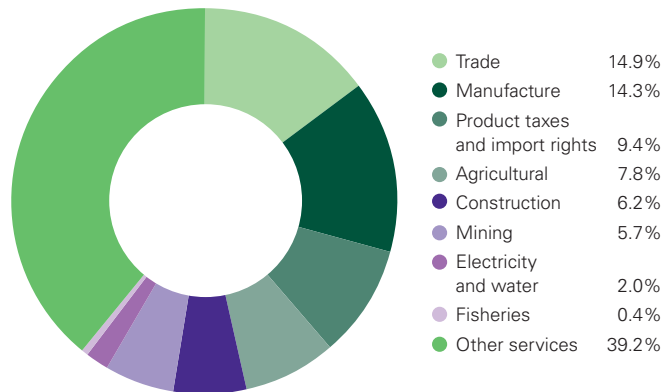
### Mining and GDP

At the national level (see Part II for local impacts), mining has not been a leading growth sector since 2005. The sector accounted for approximately 5.7% of GDP in 2009 (Chart 9), and has grown 12.8% in the last five years.

The mining sector's contribution of some 6% to total national income translates into a significant rise in job creation. According to the Mining Institute of Engineers of Peru, over 2.5 million people were the beneficiaries of jobs created by the mining sector in Peru in 2008. This includes 127,228 workers directly employed in large-scale mining (an 80% increase in nine years) and 508,912 indirectly employed. Along with these figures, a further 1.9 million dependents of these workers should also be taken into account (an estimated three people are sustained by each worker). The indirect jobs are in engineering and construction, accounting, legal, environmental, apparel, transportation, security and food services (see Part II for local vendor profiles).

These figures do not represent a major contributor to Peru's employment – reaching only 1.2% in 2008 compared with 40% for agriculture, for example. However, it is essential to note that the average skill set and income of a mining worker far outpace that of an agricultural worker. Also, estimates hold that “informal” or sub-employment (covering the underpaid, underemployed or unemployed) in mining is only 16%, compared to 65% in agriculture. These differences help mining employment to facilitate other economic activities, creating much greater leverage than, for example, agricultural employment.

Chart 9: GDP composition by sector, 2009



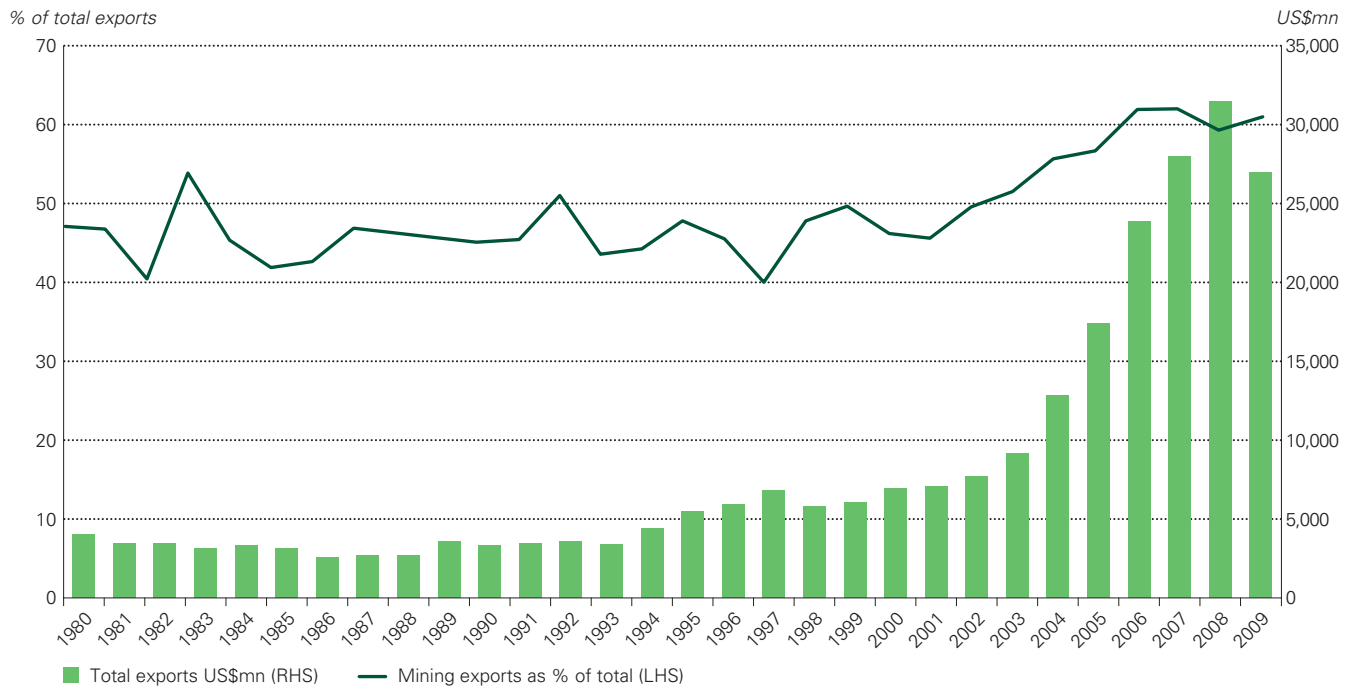
Note: Deviations of 0.1% from 100% total result from rounding errors.

Source: BCRP, Cuadros Anuales Históricos

### Mining and exports

While following a similar trend to overall exports in Peru in recent decades, mining exports have consistently represented between 40% and 60% of the total for the last three decades. It follows that mining exports appear to respond to open trade policies in much the same way as agricultural and other exports. The large increases in total mining exports since 2005 (Chart 10) are significantly influenced by rising gold prices (Chart 11), as gold production levels have remained broadly stable for the last five years.

**Chart 10: Total and mining exports 1980 to 2009**



Source: BCRP, <http://www.bcrp.gob.pe/estadisticas/cuadros-anuales-historicos.html>

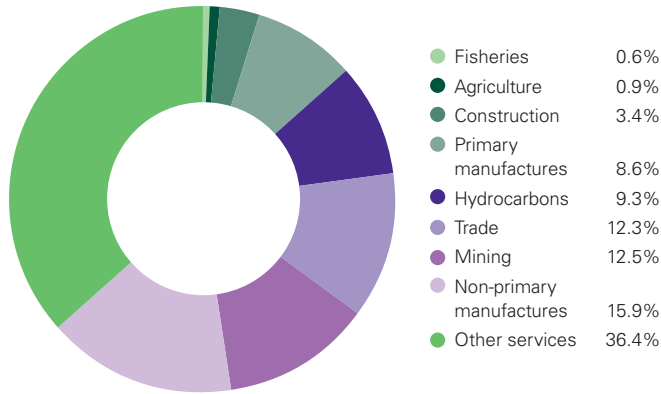
**Chart 11: World gold prices, 1994 to 2011**



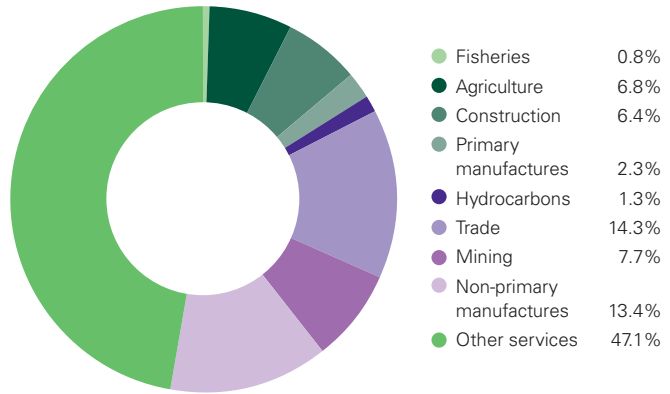
Source: World Gold Council

**Chart 12: Government revenues per sector vs. GDP per sector (1999 to 2009)**

**Government revenues per sector**



**GDP per sector**



Note: Deviations of 0.1% from 100% total result from rounding errors.

Source: Reproduced from SNMPE (2011), Figures 8 and 9. Original source cited: SUNAT.

### Mining and government revenues

The mining sector has been one of the largest taxpayers in Peru throughout the last decade, representing 25% of total government revenues at its peak in 2007. While mining revenues have grown in absolute terms in recent years, so have those from other sectors, decreasing the proportion from mining. This is a positive indication in terms of Peru's economic sustainability; the country's natural resources base has been used to generate an increasingly diversified economy.

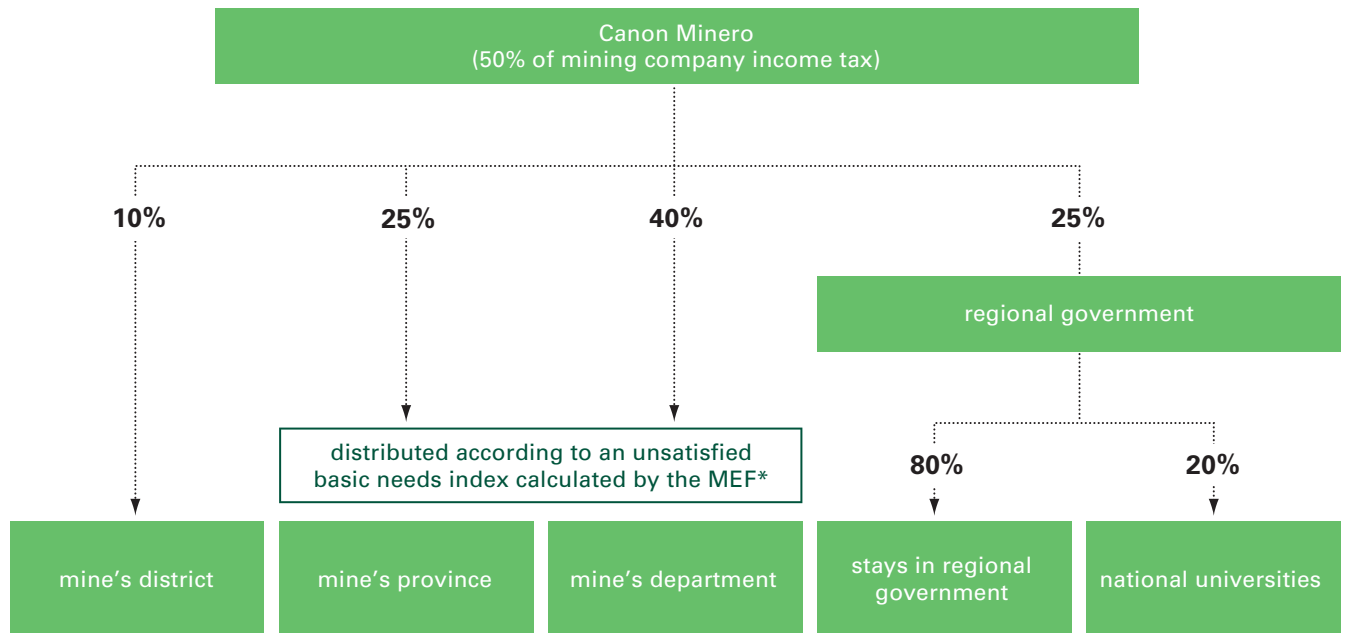
In comparison to its contribution to GDP, notes OPM, the mining industry is a strong contributor to government revenues (Chart 12). For example, the sector contributed an average 12.5% to government revenues between 1999 and 2009 (whereas its GDP contribution was 7.7%).

### The Canon Minero

In response to claims that mining regions were losing out on benefits flowing from the industry's overall economic impact, Peru established the Canon Minero. This is a mechanism for the direct distribution of mining revenue from central government to sub-national governmental entities through the earmarking or hypothecation of 50% of corporate income tax collected from mining companies. These distributions (Chart 13) are to be spent on projects contributing to sustainable development by districts, provinces and departments (the sub-national governments).

As OPM finds, while the Canon has transferred increasing revenues in recent years (Chart 14), its effectiveness is necessarily dependent upon sound governance and public fiscal management, as well as adequate administrative capacity at the sub-national government levels in order to translate into lasting improvements to local living conditions.

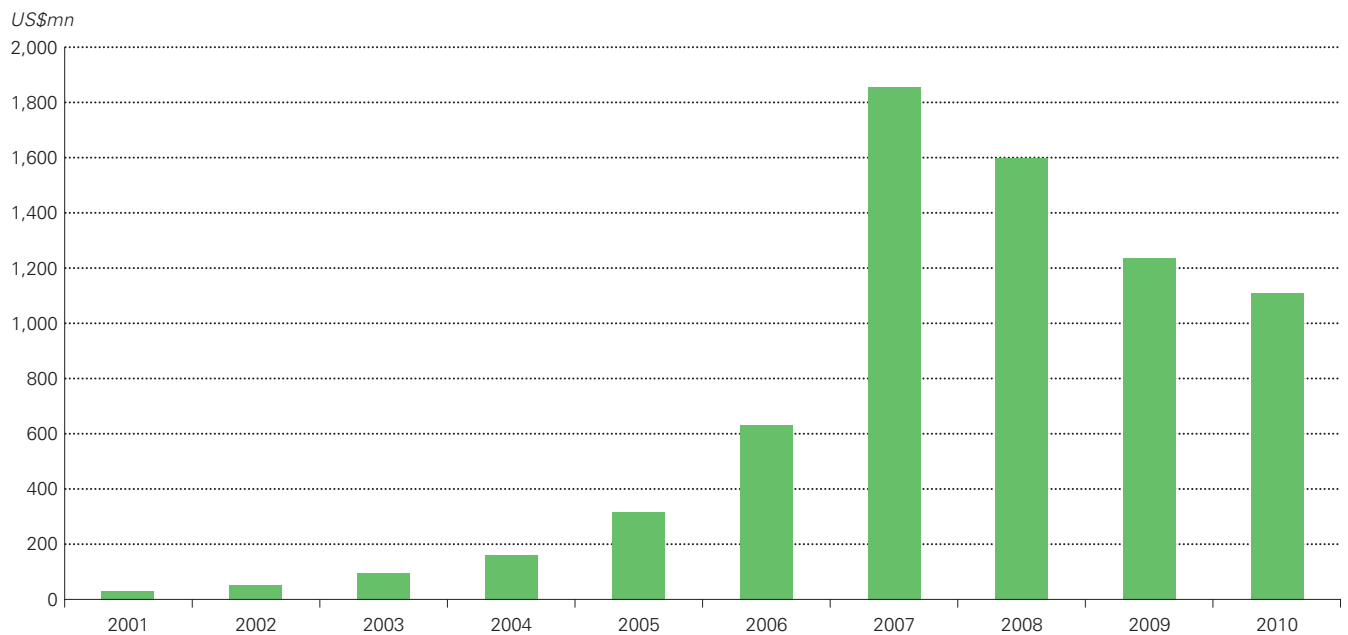
**Chart 13: Distribution system of the Canon Minero**



\*Ministry of Economy and Finance

Source: Reproduced from Dammert, A. and F. Molinelli (2007). Original source cited: MINEM.

**Chart 14: Total Canon Minero transferred 2001 to 2010 (in US\$ million)**



Source: SNMPE. Exchange Rate 25/01/2011: USD 1 = PEN 2.77

# Part II: Impact of the sample mines

The mines included in this study are the top-producing gold mines operated by World Gold Council member companies in Peru. These are Yanacocha (Newmont), Cerro Corona (Gold Fields), Lagunas Norte (Barrick) and Orcopampa (Buenaventura), which together represent nearly 60% of total gold production in the country.

**Table 1: Participating companies and mines**

Company (controlling interest/operator)	Mine	Region	2009 Production (000 Au oz)
Newmont	Yanacocha	Cajamarca	1,057
Barrick	Lagunas Norte	La Libertad	1,000
Gold Fields	Cerro Corona	Cajamarca	394
Buenaventura	Orcopampa	Arequipa	279

## The Life-Cycle Assessment (LCA)

The LCA data collection template designed by OPM for this study (see Appendix) requested information in several main areas:

1. Basic data on the mine – when exploration started, when construction started and finished, and when the mine started operating.
2. Revenues: production volumes and sales.
3. Royalties.
4. Capital expenditure (CAPEX):
  - a. either (i) Services and Works, or (ii) Equipment and Materials.
  - b. Local Content, split into two components: Community Content and National (i.e. total domestic) Content.
5. Operational expenditure (OPEX) – either (i) Services and Works, or (ii) Equipment and Materials.
6. Community contributions.
7. Taxes.
8. Mine closure costs.

## Findings of the LCA

It is important to highlight a number of limitations on the time period of data collection for the LCA. First, some companies have changed to different accounting systems at some point during the mine's productive life, making data collection before that change impractical for this study. Also, it is only possible to use data from those years when at least two mines in the sample reported data, in order to aggregate the figure and thus preserve the confidentiality of internal company information. As a result, the data period used was from 2005 to 2018. Much of the productive lives of the sample mines are included in this time span, but not all, and in some cases the key phase of construction, when large numbers of jobs and procurement figures are registered, is not included.

Even if the entire lifespan of each mine were included, however, it would still be the case that, given the finite life of all mines, there would eventually appear to be a steep decline in production, employment and procurement as mines wind down and eventually close. This does not mean, of course, that new projects will not come online to replace these economic inputs to the extent possible. For one example, an estimate given for new mining investment coming into Cajamarca alone was US\$26 billion over the next eight to ten years (for mining of all commodities, although mostly gold and copper). Newmont's Minas Conga will start construction soon, perhaps as early as this year, and is projected to operate until 2031. Also, when the value of silver and copper as byproducts of these mines are taken into account, the annual production figures increase by 10% on average.



**Chart 1: Sample gold mines**



**Yanacocha (Newmont)**

Yanacocha ranks as the largest gold producer in South America. Majority owned by Newmont (51.36%), it is also partly owned by Buenaventura (43.65%) and the International Finance Corporation (IFC) (5%). Located in the province of Cajamarca, the mine lies some 800 km northeast of Lima.

About 10% of Cajamarca’s workforce is employed at Yanacocha, between its 2,300 employees and 6,700 contractors. Yanacocha’s workers are 99% Peruvian, with 90% of them permanent residents of the province and 57% native *cajamarqueños*. Its 500 local suppliers provide a wide range of materials and services from construction to radio communications. A significant boost to the local infrastructure has been the hundreds of miles of surrounding roads which have been upgraded or constructed, including the US\$40 million paved road allowing Yanacocha’s heavy trucks to bypass the town of Cajamarca.

**Lagunas Norte (Barrick)**

Wholly-owned Lagunas Norte sits on Barrick’s Alto Chicama property in north-central Peru, 140 km east of Trujillo, in the western Andes. The nearest city is Huamachuco (pop. 20,000) 40 km away, and the nearest town is Quiruvilca (pop. 3,000) 15 km from the mine. The mine currently employs some 450 employees and 1,500 contractors.

**Cerro Corona (Gold Fields)**

Cerro Corona sits some 40 km north of Yanacocha, in the heights of the western Cordillera of the Andes mountains. Gold Fields La Cima, which runs Cerro Corona, is a member of the Good Corporate Governance Index (IBCG) of the Lima Stock Exchange based on its practices in transparency and social responsibility.

**Orcopampa (Buenaventura)**

Orcopampa is the only mine in the sample located in southern Peru. Sitting in the province of Castilla, in the department of Arequipa, the mine is 1,350 km southeast of Lima, at a challenging elevation of 3,800 m above sea level. The population of Orcopampa, the nearby town, exceeds 6,500 and the total provincial population is approximately 36,000. Until 1980, when exploration of its gold veins began, Orcopampa was primarily a silver mine.

## Contribution of sample mines at the national level

Gold production in Peru has been increasing rapidly since the early 1990s (Chart 7). Based on our sample mines and the data period (2005-2018) of the LCA, production peaked in 2005. However, because the macroeconomic effects of the post-2005 production decline (Chart 15) have been balanced by higher gold prices, OPM points out that the government has been spared the falling tax revenues and foreign exchange earnings that would have occurred with stable prices.

## Exports

Due to rising gold prices, exports (taken to be the total value of production in any given year) for the four mines peaked in 2009 (Chart 16), whereas production volume peaked in 2005. Exports from the four mines represented over 20% of total mining exports and 12% of total exports in Peru in this year, meaning that more than one in every 10 dollars exported came from these four mines in 2009.

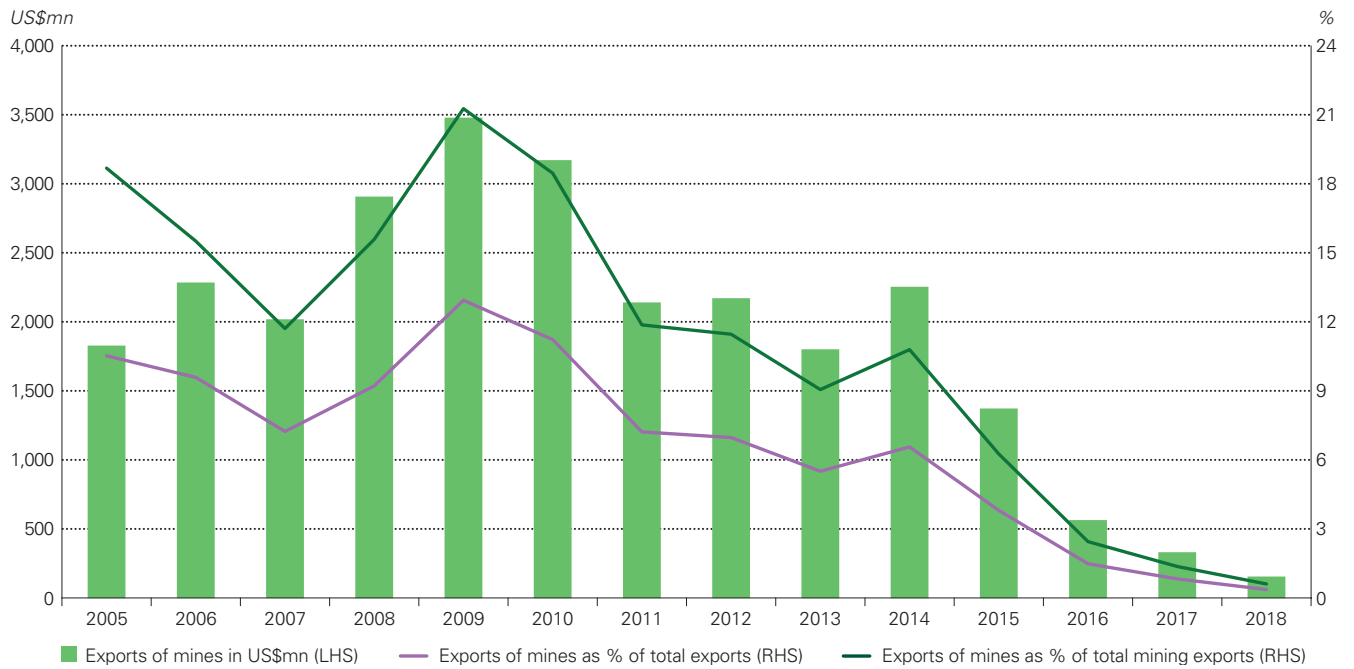
Normally, a mine's construction phase is marked by very large imports due to infrastructure development requirements, resulting in negative trade flows. As the mine becomes operational, imports decrease significantly. Due to data limitations or construction periods which fell outside of the period under review, construction-phase data was not available for the four mines in the sample, meaning that the data period does not reflect any negative trade impacts but rather a large, positive contribution throughout (Chart 17).

**Chart 15: Gold production: Yanacocha, Cerro Corona, Lagunas Norte and Orcopampa, 2005 to 2018**



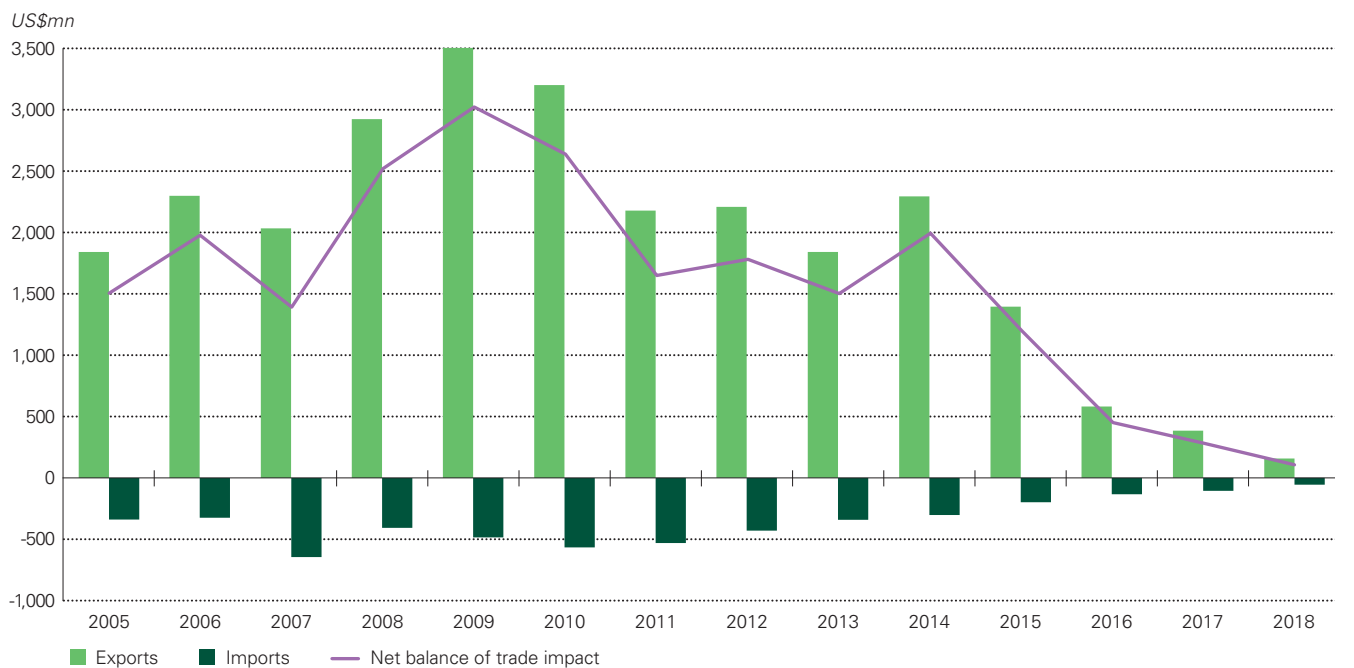
Source: Companies' data and OPM calculations

**Chart 16: Contribution of the four gold mines to exports, 2005 to 2018**



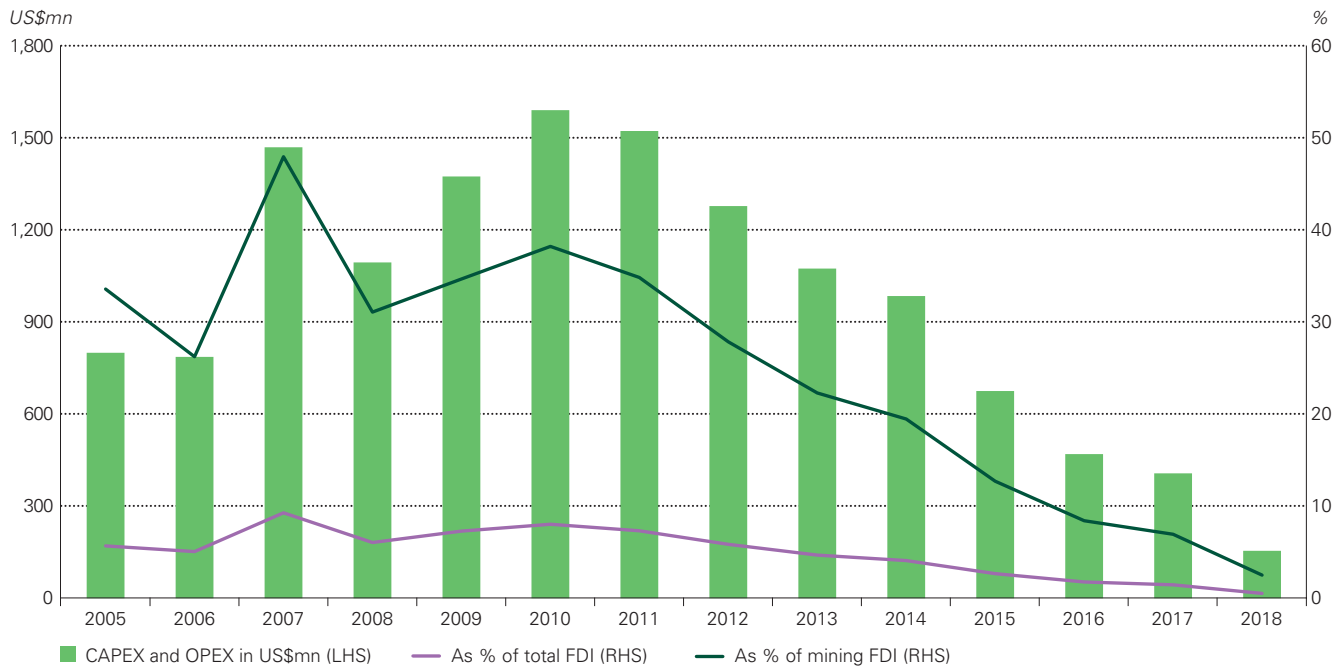
Source: Companies' data and OPM calculations

**Chart 17: Effect of the four gold mines on the trade balance, 2005 to 2018**



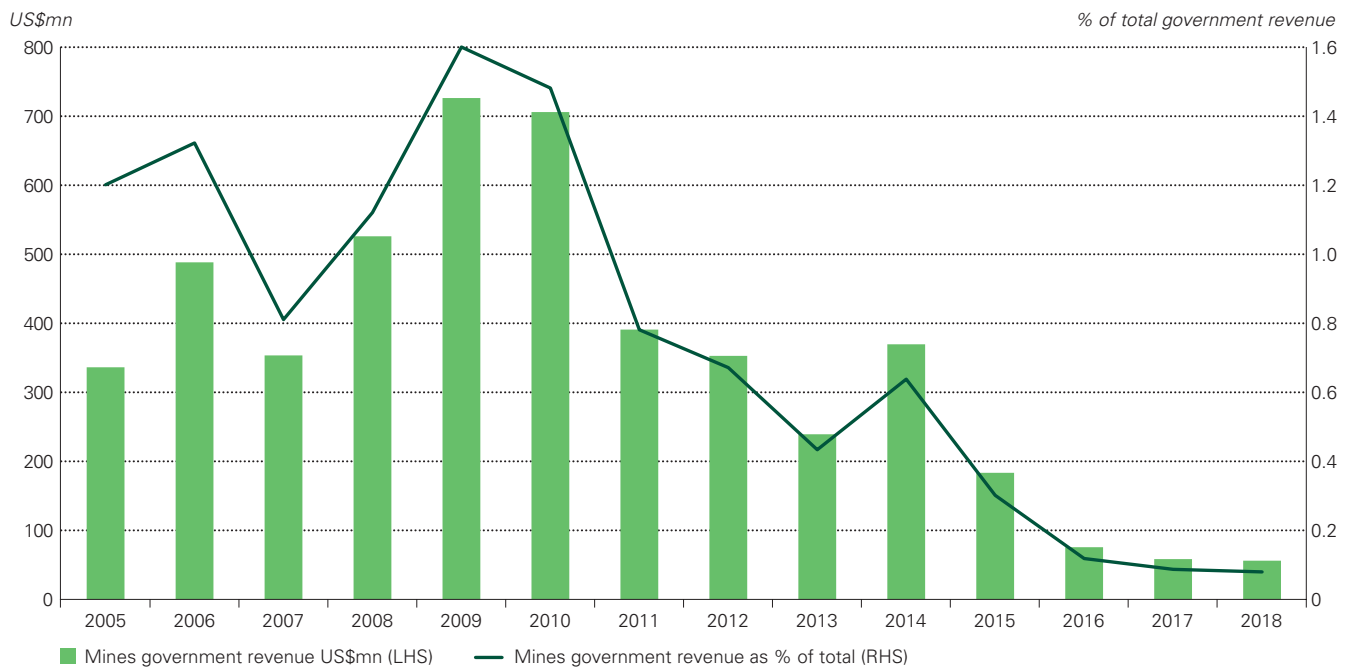
Source: Companies' data and OPM calculations

**Chart 18: Contribution of four gold mines to FDI, CAPEX and OPEX, 2005 to 2018**



Source: Companies' data and OPM calculations

**Chart 19: Contribution of the four gold mines to government revenues, 2005 to 2018**



Source: Companies' data and OPM calculations

### Investment

As a capital-intensive industry, large-scale mining necessarily requires large amounts of investment. The contribution of the four mines to Peru's FDI (Chart 18) is striking in that it represented over 30% for the overall mining sector and nearly 10% of all FDI for the country. In all of its peak years (2007, 2009, 2010 and 2011), total capital and operational expenditure (CAPEX and OPEX) exceeded US\$1.2 billion for the four mines, making the gold mining sector a significant contributor to foreign reserves.

### Government revenue

Peru's government revenues are primarily generated through corporation income tax, regional and local tax, withholding taxes and royalties. As seen in Chart 19, approximately US\$800 million in revenues was collected by the government from the four mines in 2009 (1.6% of total government revenues). As the four mines approach closure, of course, this tails off significantly (reaching only a third of the peak by 2013) and will necessitate alternative sources of income, or new mines, to fill this gap for the Peruvian government.

### Indirect government revenues

Indirect revenues to the government arise when households and domestic suppliers pay various indirect taxes linked to the work, goods or services they supply to the mines. In addition, these same households and domestic suppliers pay taxes directly on their gross incomes. Spending their incomes from the mines on other goods and services, and paying tax on these, households

and suppliers further generate indirect government revenues from the mines. Although such indirect revenues were not modelled in this study, it is clear that additional revenues are generated over and above those measured in this section.

### GDP

One primary impact of the four mines is their contribution to Peru's national income or gross domestic product (GDP), which measures the total value added of all sectors in the economy. Based on the findings of the LCA, OPM estimates that the four mines have made a significant contribution of between US\$1 billion to US\$2.5 billion annually to Peru's GDP since 2005, or some 0.6% to 1.8% of total GDP. Peaking in 2009 at over US\$2.5 billion (as a result of high gold prices), the contribution to GDP from the four mines was relatively low in 2007 in line with national mining production.

Still greater would be the overall contribution, which measures not just this direct impact but also the indirect (counting supplier effects) and induced (capturing spending by impacted households) contribution to national income by the four mines. This would include an array of consequential effects of the mine, although usually only the measurable multiplier effects are taken into account. Particularly in Peru, where these mines have integrated the local economies (firms and workers) into their operations to the extent possible, this multiplier effect is pronounced. OPM, using previous studies, suggests a multiplier of 1.9 which when applied to the 1.8% direct contribution to GDP mentioned above yields a 3.6% contribution when indirect impact is included (Chart 20).

**Chart 20: GDP generated by the mines, 2005 to 2018**



Source: Companies' data and OPM calculations

## Contribution of sample mines at the local level

The effects of our sample mines, like those of most large-scale mining operations, include employment, capacity-building, procurement from local suppliers, community contributions, infrastructure development and taxes paid. Although the direct employment from large-scale, capital intensive mines is relatively modest, the absolute numbers are very meaningful to local communities. Employment by the mines in our sample is set to peak within the data collection period at around 5,000 workers in 2011, of which a full 99% will be Peruvian nationals.

More significantly, however, the four mines' expenditure with national suppliers averages 90% of total procurement, or nearly US\$1.4 billion per year from 2007 to 2010. In some years, this exceeds twice the total of all taxes paid by these mines. The local effects of this expenditure are just as noteworthy, with 41% of all purchases from national suppliers going to community-based firms, or some US\$70 million.

### Local employment

Employment at large-scale mines varies throughout the mine's life, from exploration, construction and operation through to closure. As this overall mine life-cycle can last anywhere from a decade to centuries, job creation even at a single mine can be a lasting factor in sustainable development. In our sample, the four mines reported strikingly high levels of local employment, with nearly all employees being Peruvian nationals – most of them coming from the surrounding communities.

In 2010, the sample mines employed 4,500 workers, up by 1,000 from 2005. During the data collection period, this looks set to peak in 2011 at 5,000 workers (Chart 21). Of course, given the approaching closure of several mines, the employment figures tail off near the end of the collection period.

According to Edwin Amoretti of Yanacocha's Social Responsibility team, the company's goal of having 60% of its employees originating from the department of Cajamarca has been met for the past four years. While this is a challenge, he notes, it has been achieved through local recruitment and training of young (age 18-plus) workers, in a collaborative effort with the municipal authorities who help to identify candidates. "The candidates chosen train for 280 hours on heavy machinery with us, but then they can use those skills in any company," said Amoretti. Out of the 80 graduates of the programme in 2010, Yanacocha hired half and is now looking to replicate the programme for other areas like environmental management and project development. Yanacocha also trains local workers outside of the mine in farming, stonework, knitting and other skill sets.

Alberto Calle, who heads Human Resources for Yanacocha, highlights the company's internal, 32-person training team. The training, in mine operations, maintenance and process plant, includes an evaluation of each new employee's training needs and then a personalised training plan to fill in identified gaps. Job openings are posted first internally and with contractors, then externally via both the company website and through the Social Responsibility team's regular community meetings. Calle relays the comment made by a female haul truck driver regarding her job at Yanacocha: "I wake up every day and still can't believe this new life isn't a dream." Yanacocha, he explains, strives to make such positive impacts on local workers, while at the same time hiring and training qualified employees. With the potential upcoming construction of Minas Conga, some 6,000 additional hires are expected.

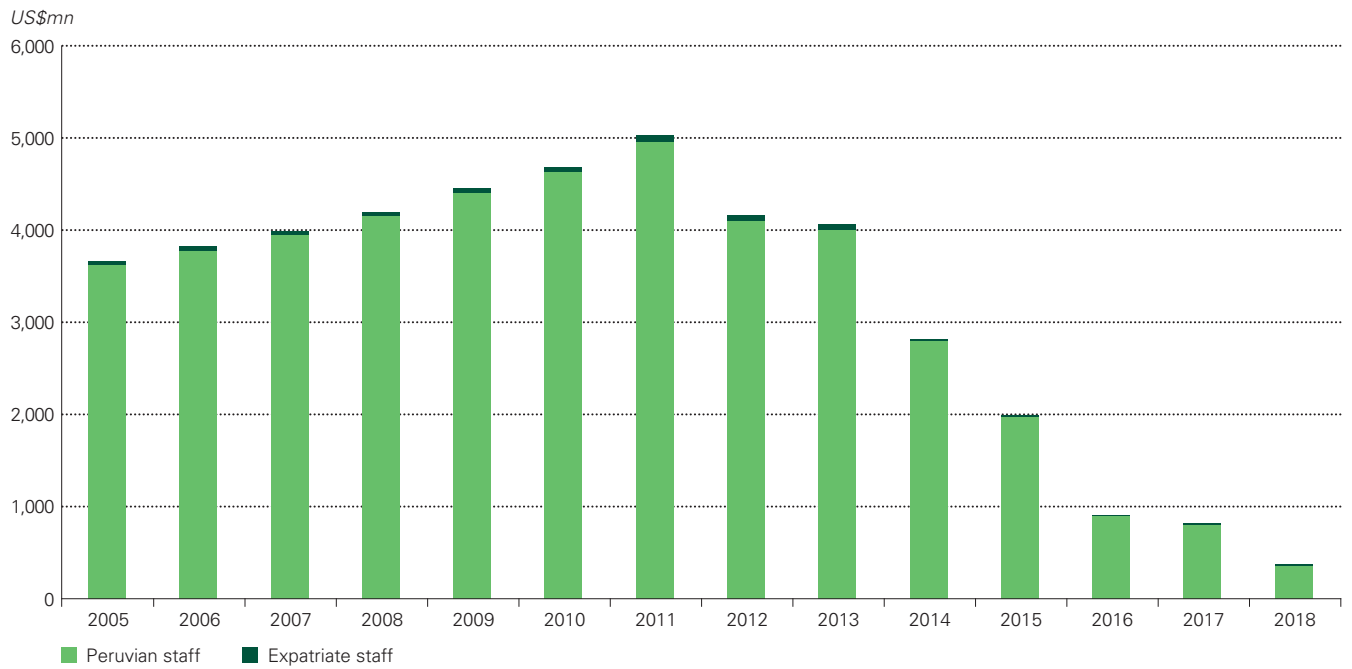
Head of Cerro Corona Human Resources, Rafael Tupayachi, describes the company's training process, involving the identification of each employee's training needs and a corresponding training plan. To fill new positions, Cerro Corona first looks to its already-skilled employees, and then posts openings with its contractors, before offering the positions externally. In addition, the company has an alternative process, through an agreement with the community, to train 60 young entry-level workers each year. The trainees then apply at Cerro Corona and elsewhere (as the mine cannot absorb 60 new entry-level workers each year). "We've seen the public perception change," said Tupayachi, "from thinking that living near the mine meant a job for life to seeing that Cerro Corona provides quality training that should be used for a variety of jobs in the area."

At Buenaventura's Orcopampa, employee recruiting and training is outsourced to the global human resources provider, Manpower. While Orcopampa does offer its own training programmes in safety and quality control, this is supplemented in various areas where the company does not have training resources. A recent round of recruitment brought in 100 local residents, who underwent several training courses. Manpower maintains a database of skills among local job candidates, so that when Buenaventura has job openings, the right candidates can be quickly identified. Of the Orcopampa workers, 100% are Peruvian.

### Local salaries

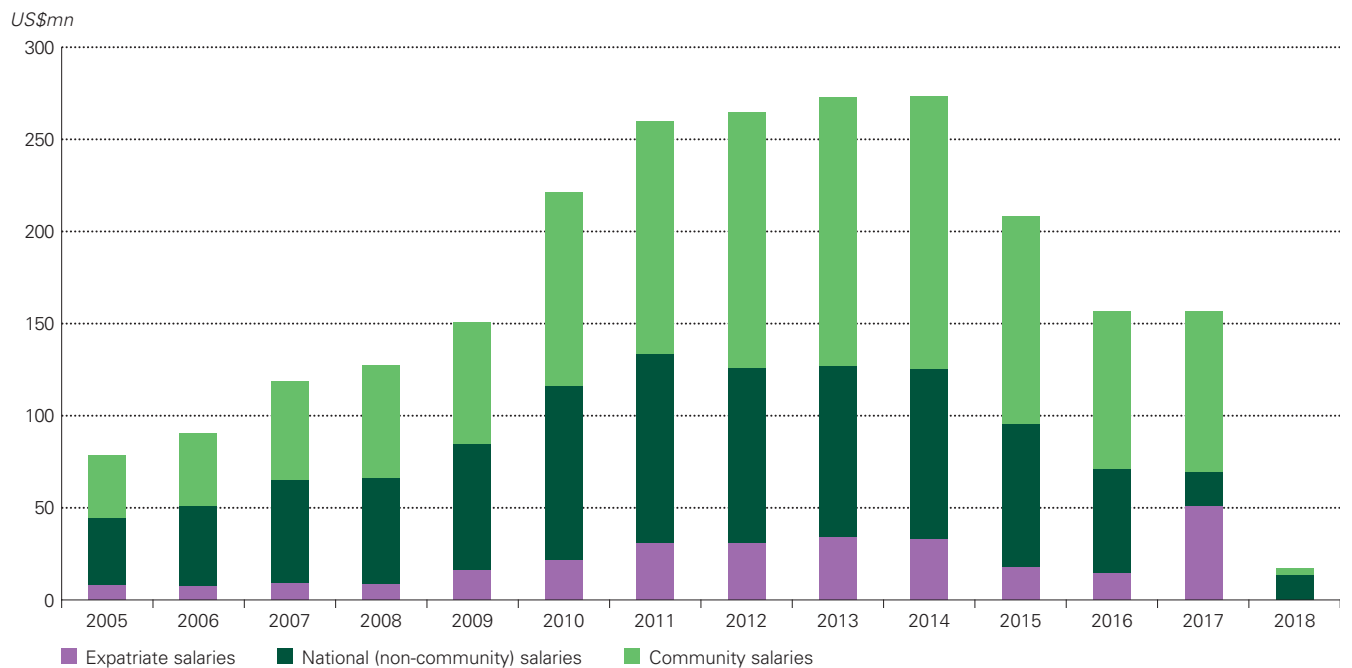
Local and national salaries tend to be lower on average than expatriate salaries, as expatriate employees are used only for highly skilled, high-value management or technical services (Chart 22). However, as a general rule a significant proportion of expatriate salaries remain in the local or national economy. Of the US\$250 million in salaries expected to be paid in the peak years of 2011-2014, community salaries account for more than US\$100 million – a significant boost to the local and regional economies.

**Chart 21: Direct employment (national and expatriate) 2005 to 2018**



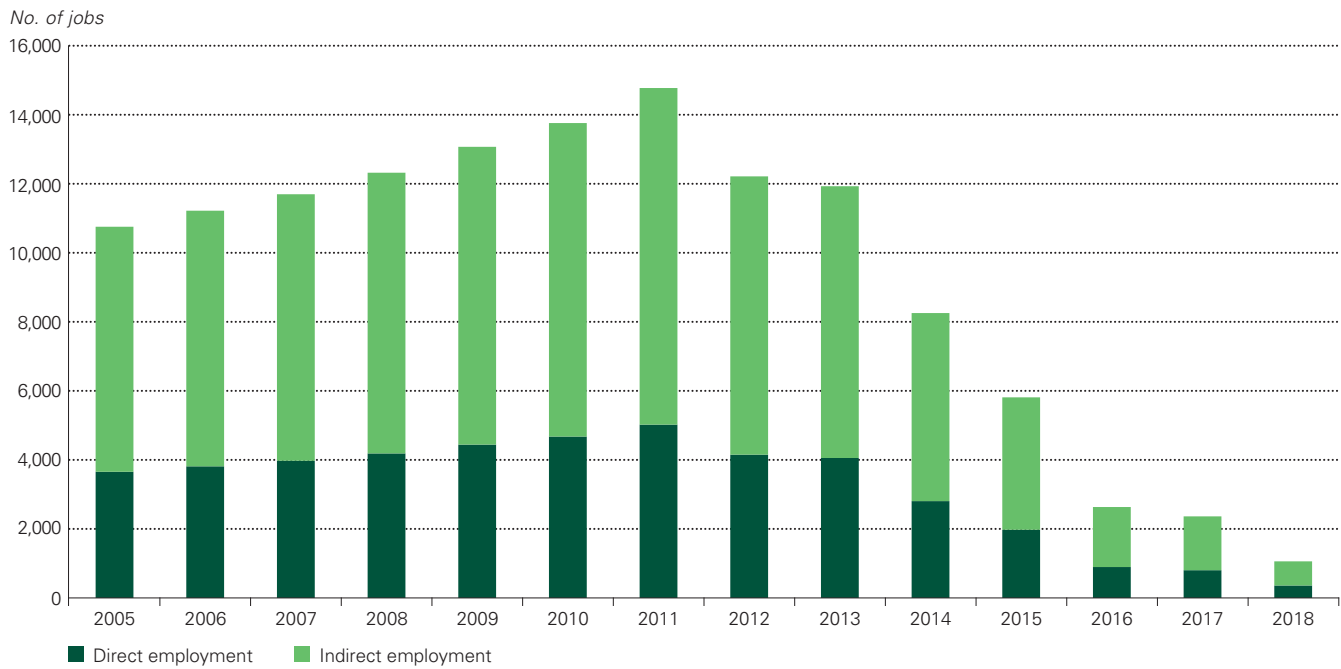
Source: Companies' data and OPM calculations

**Chart 22: Wage bill of the four gold mines (community, national and expatriates), 2005 to 2018**



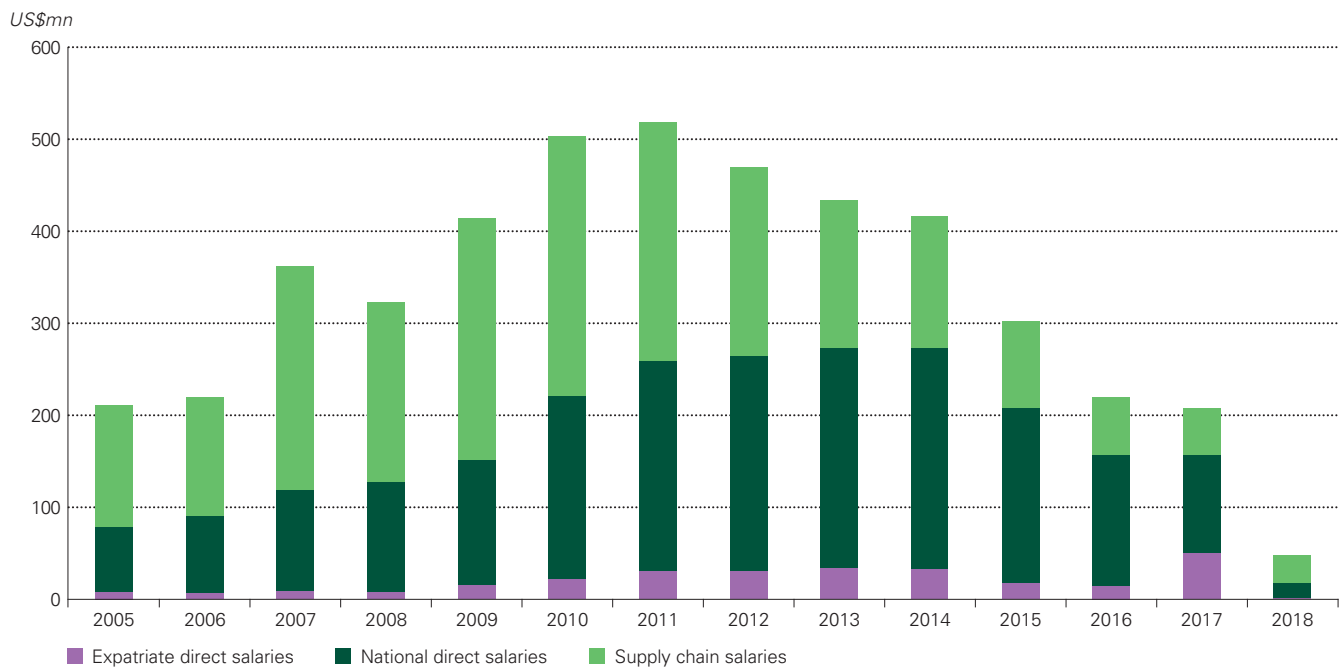
Source: Companies' data and OPM calculations

**Chart 23: Number of full-time jobs generated by the four gold mines, 2005 to 2018**



Source: Companies' data and OPM calculations

**Chart 24: Expenditure on wages, 2005 to 2018**



Source: Companies' data and OPM calculations



### Employment multipliers

Despite the non labour-intensive nature of the industry, the sample mines will provide 4,000 jobs on average per year from 2005 to 2014. Furthermore, indirect impact on job creation can be measured through economic multipliers, which OPM estimates at 1.9 for this study. The multiplier effect is based on:

- Spending on goods and services which support employment
- Direct employees spending their salaries in the host economy
- Employees of national suppliers spending salaries in the economy
- National suppliers spending revenues from the mine on local inputs as well as taxes; and
- Profits of national suppliers and lower-tier suppliers spent on consumption rather than investment.

Based on this multiplier, we can estimate that the indirect job creation impact of the four mines from 2005 to 2014 was approximately 8,000 annually (Chart 23).

In terms of salaries, this equates to US\$186 million on average to direct employees of the sample mines, of which US\$166 million goes to national labour between 2005 and 2014 – meaning that only a small percentage goes to expatriate workers. However, throughout the supply chain, additional salaries generated by the mines total nearly US\$200 million on average for these years, with up to US\$500 million being generated in the peak years (Chart 24).

### Local opportunities: Cruz Verde

Cruz Verde began operation in 2004, providing bus transportation services to Lagunas Norte. Owner Rodolfo Ruiz had the idea of forming the company after selling his 18 hectares of land and identifying opportunities around the mine.

Ruiz used his savings as well as credit to purchase the first two buses, and has since added a third. Barrick provides Cruz Verde drivers with general job training as well as driving instruction, and supports the company with community relations training through the local chamber of commerce.

“We’ve run into labour shortages during mine expansion periods,” remarked Ruiz, explaining that he has had to recruit drivers from as far away as Cajamarca. Cruz Verde’s drivers work 14 consecutive days, with seven days off, and serve a variety of routes connecting the small communities surrounding Lagunas Norte to the mine.

“I wanted to be a business owner, not an employee,” said Ruiz. “That’s always been my plan, and now it’s come to fruition.”

### Local opportunities: Ferreyros

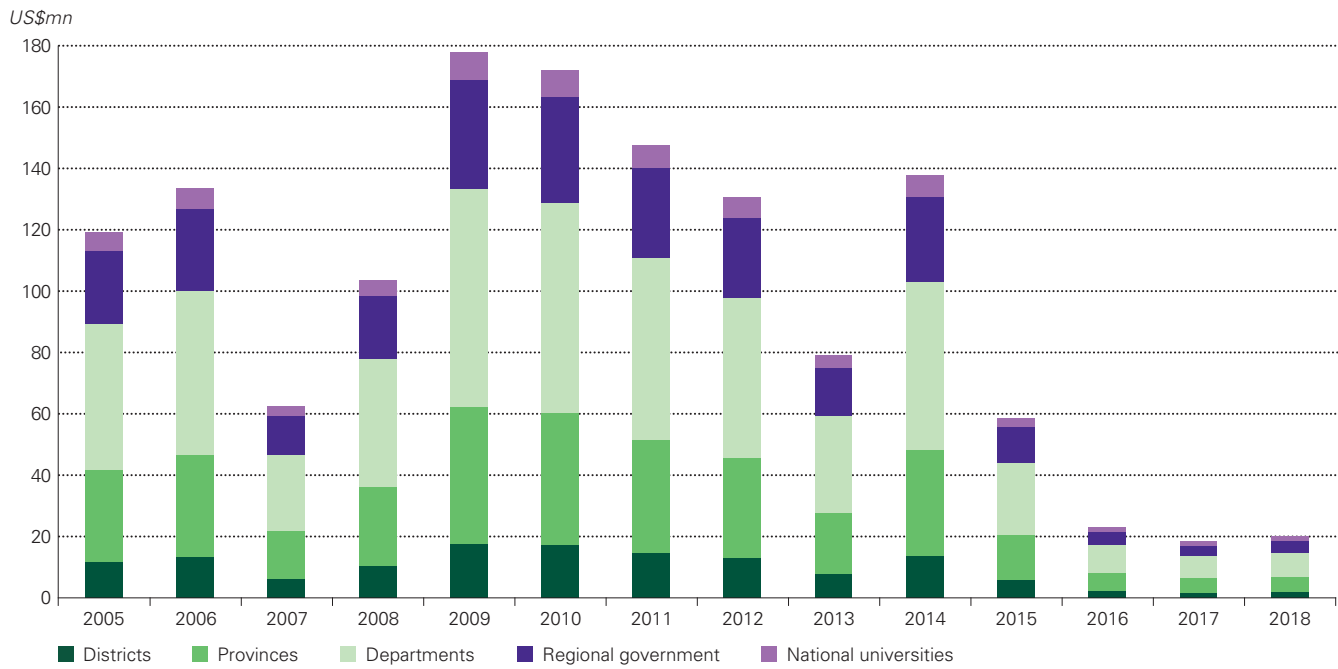


Luis Miñano of Ferreyros.  
(Photo courtesy of Ferreyros)

Ferreyros of Peru has been in business for 87 years, serving as Peru’s authorised dealer of Caterpillar equipment as well as that of Atlas Copco, Iveco and Kenworth. In 2007, Ferreyros began its contract with Lagunas Norte, after some 14 years working with Barrick’s Pierina mine in Peru.

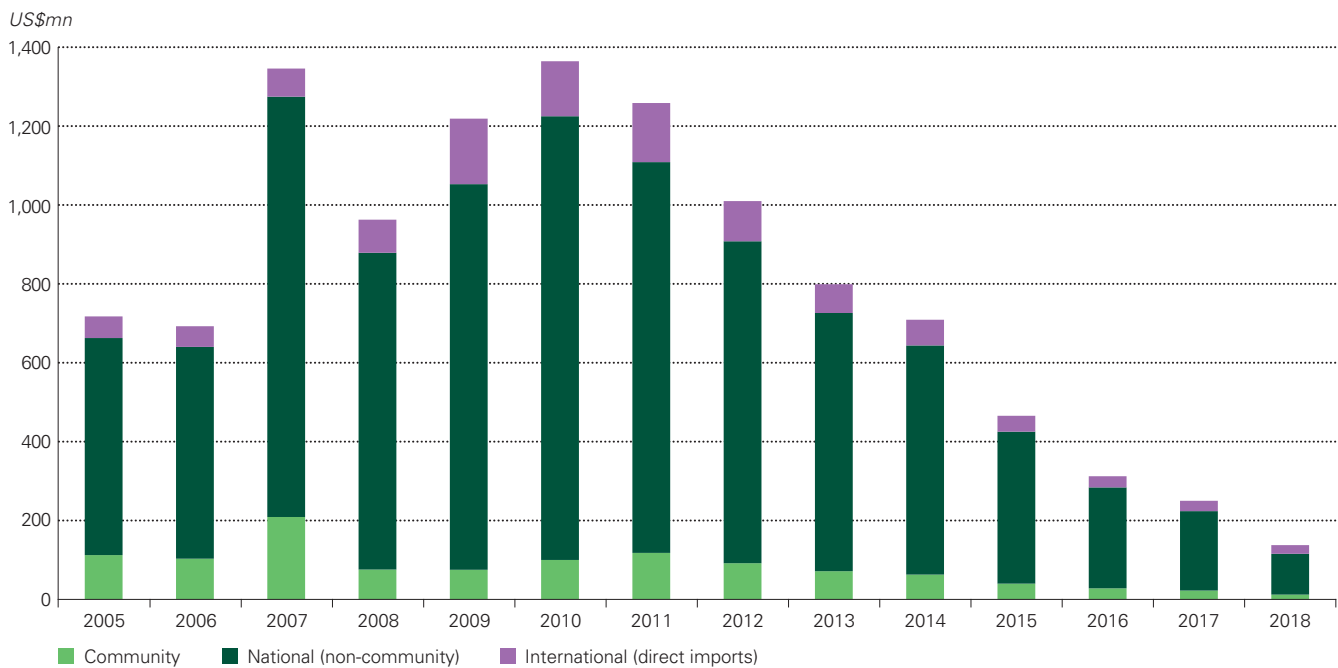
“All of our training, support and logistics come from Caterpillar,” said Luis Miñano of Ferreyros, mentioning training programmes in safety and prevention, vehicle operation and environmental impacts, as well as career management. Unlike the many community suppliers in the study, Ferreyros is a major, national company supported by an international partner like Caterpillar. It is a publicly traded company on the Lima Stock Exchange and takes in some US\$12 million per year from Barrick alone in Peru. At Lagunas Norte, its workers come from Trujillo instead of the immediate surrounding communities. After the closure of Lagunas Norte, said Miñano, “we have a number of other clients and opportunities in the vicinity to continue to employ our workers.”

**Chart 25: Canon Minero distributions for the four mines, 2005 to 2018**



Source: Companies' data and OPM calculations

**Chart 26: Capital and operational expenditure by the four mines, 2005 to 2018**



Source: Companies' data and OPM calculations

### Local taxes: the Canon Minero

By means of the Canon Minero, some US\$180 million has been distributed in 2010 from the four mines, of which approximately US\$70 million went to departments, US\$43 million to provinces, US\$34 million to regional governments, and US\$17 million to districts (Chart 25).

### Local procurement

As previously noted, the significance of the four mines' combined expenditures is underlined by the fact that it was more than twice the total taxes paid by them in some years during the data collection period. This injection into the local economies surrounding the mine sites can be measured in a variety of ways, from indirect job creation to sustainable business development and overall capacity building at many levels.

The participating companies in our study indicated that they considered national suppliers to mean those with a Peruvian address on the purchase order. In at least some cases, however, it is not possible to ascertain how much of this expenditure actually stays in Peru. For example, rather than having been manufactured in Peru, heavy equipment is likely to have been imported by the national supplier for resale – although much of the installation and ongoing maintenance work for this equipment will have been carried out by highly-skilled Peruvians.

In the data collection period, the percentage of the four mines' expenditures on national suppliers (including local agents of international companies) averaged 90%, and in 2010 totalled US\$1.27 billion or twice the total taxes paid of US\$0.63 billion (Chart 26). Capital expenditure through national suppliers was between 25% to 40% of the total. Expenditure at the community level, and specifically for services (which excludes materials and equipment), as well as operational expenditure through community suppliers, was between 15% to 20%. For 2010, OPM estimates that 41% of capital expenditure on national suppliers went to community firms. In the context of most extractive industries, these are relatively high figures, and most likely reflect the maturity of local suppliers in the regions studied and the long-standing nature of mining skills in Peru.

### Local opportunities: Santa Maria Hualgayoc



Santa Maria Hualgayoc workers at a construction project at Cerro Corona. (Photo courtesy of Santa Maria Hualgayoc)

Oscar Galvez Gil and his partner Miguel Godoy Quiroz started their company, Santa Maria Hualgayoc, in 2006. Knowing the Cerro Corona team, they were familiar with the opportunities to serve the mine and began offering transportation and construction services. Gold Fields provided the company with training in management, safety, environmental management, and basic business start-up skills.

“Although Gold Fields has been our sole client so far,” said Galvez, “we’re looking to expand to work for both the city of Hualgayoc, as well as some of the new mining projects to be developed locally.”

The impacts of the business, according to Godoy, have been significant. “Not only can we provide a much higher standard of living for ourselves and our families, but we’re also helping to elevate the job prospects of our local workers through the training and job experience gained at Cerro Corona,” remarked Godoy.

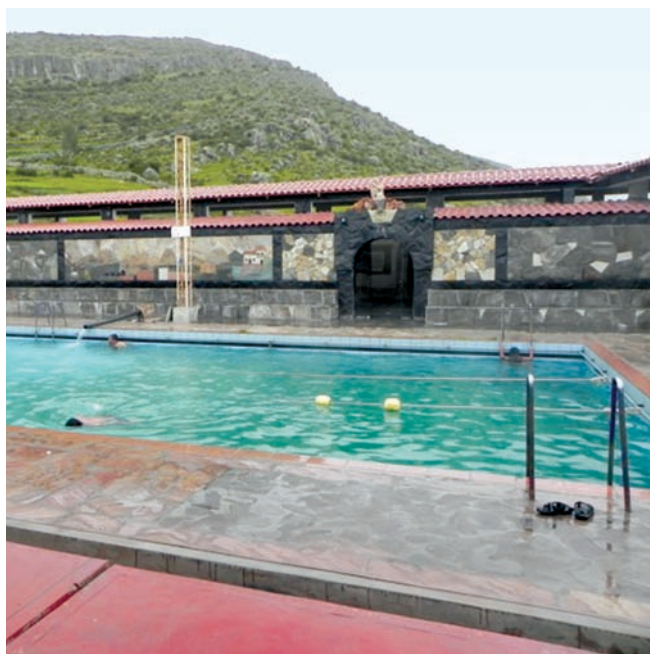
Further, breaking down capital and operational expenditure into 1) services and works and 2) equipment and materials, OPM expected to see a higher percentage spent on national suppliers for the former, since services and works do not typically include expenditure on imported equipment. However, most likely due to participating companies' definition of "national" suppliers as those with a Peruvian address on the purchase order, we see a reversal of this pattern. In 2010, 94.9% of expenditure on equipment and materials went to national suppliers, while some 90.1% went to them for services and works. Similar patterns emerged across the other years in the study period.

Henry Paredes Linares, Head of Procurement for Yanacocha, explained that limits to the use of local content are based on several variables: "the business knowledge in community companies, the investment that Yanacocha is prepared to make in order to develop local suppliers, the level of economic development of the region, and the willingness of suppliers to work with us as a team, recognising we are a for-profit company and not a training institute." He notes that in the provision of goods, it is harder for local firms to compete because Yanacocha's requirements are complex and usually best served by national or international providers. In services, however, they can and do compete – some 23% of these providers are from the department of Cajamarca. The company's partnership with Asociación Los Andes de Cajamarca (ALAC), Paredes mentions, helps to develop and support these local firms.

Alfredo Barandiaran from the Community Relations team at Cerro Corona says that, at times, the mine has had up to 100 local suppliers, divided into three specialties: heavy machinery, light trucks/transportation, and general services. "Many of the companies we've trained," says Barandiaran "are now working in Buenaventura's new project, La Sanja, as well as Conga and Lumina Copper. They all started from scratch working for and receiving training from Cerro Corona. So, these are sustainable businesses." Some of these local firms have made up to US\$6.5 million in revenues since Cerro Corona's beginning.

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## Local opportunities: Empresa Comunal Turística de Aguas Termales



Local residents use the hot springs pool at Aguas Termales in Huancarama, near Orcopampa.

*(Photo courtesy of Aguas Termales)*

Cirilo Vera Sana serves as President of the Community of Huancarama, and describes with pride the community company Aguas Termales, opened in 2001. The General Manager of the company, Constantino Patiño Herencia, portrays the customer base as residents of the local districts, Orcopampa and Chilcaymarca, as well as the nearby districts of Andagua and Chachas. "On a daily basis we have between 50 and 100 customers," said Patiño, "but on Sundays and holidays we see up to 250 people."

The appeal of the hot springs is their reputed healing properties, as well as the scenic natural surroundings of the facility, "and just the chance to come [for a] soak and feel clean," claims Patiño. The company revenues come from admission fees to the facility, sales from the company store and transportation services from Orcopampa to Huancarama.

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## Local opportunities: El Aliso



El Aliso workers installing liner materials at Yanacocha.  
(Photo courtesy of El Aliso)

Narciso Llanos Tafur and his six partners, all from Cajamarca, had the idea of starting a company when they saw the opportunities to work with mining operations around Cajamarca, especially Yanacocha. The company launched in July 2004 and within four months was working for Yanacocha, providing environmental services and products. For the first few years, the business focused on selling and installing environmental erosion control barriers and irrigation channel liners, and then moved into installation of geosynthetic pipes and other water management projects. Aside from projects for the mine, El Aliso also worked with Yanacocha's community development team on projects including the construction of a local high-school and building a 9 km road.

"In 2010 the business began to expand further as we won two large contracts with Yanacocha," said Llanos, "one in the project development group and the other in operations." These projects required El Aliso to invest in installation machinery, a significant investment that will serve the business well into the future as the company pursues ongoing business with Yanacocha and expands to other mines in the vicinity.

According to Llanos, becoming a recognised vendor in the mining industry has been highly rewarding, for the economic and educational opportunities of the partners, workers, and their families. "We've worked hard," said Llanos, "and Yanacocha has also helped us with management training."

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## Local opportunities: Lyanfer



Lyanfer partners with their inventory of safety vests.  
(Photo courtesy of Lyanfer)

Lucia Roja and her business partners, eight women between the ages of 30 and 59, started their company Lyanfer in 2006, based in Quiruvilca. With four sewing machines donated by Barrick, they began making safety vests and other apparel for Lagunas Norte. At times, Lyanfer received a large order, of up to 200 pieces, with few days to deliver. "With orders like this, we stay in the workshop day and night to deliver on time," says Roja. Their business goals involve growing beyond Lagunas Norte to other nearby projects.

"Starting the business wasn't hard," states Roja, "because Barrick provided training in starting and running a small business. We hadn't worked outside the home before – all of us have families – so the training in finance, accounting and technology was very helpful."

Describing the impact of the business on her life, Roja said that it is immeasurable – to be able to earn her own pay and provide a university education for her children. Having a two-earner household, she claims, is a major, positive change.

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## Supplier development

The companies in the study all have programmes in place to foster the development of local suppliers to the sample mines. Through these, which include supplier recruitment, development, training and support at various levels, the companies are able to boost the sustainable development effects of their operations.

OPM makes the assumption that the economic benefits of supplier training programmes are at least equivalent to their cost. Given this, we can estimate that from 2005 to 2010, training benefits per supplier employee for capital expenditure averaged more than US\$1,250 per year and US\$2,000 for operational expenditure.

Some of the greatest benefits in local supplier development come from the supervision and quality control exercised by the mines over their suppliers, and then by these suppliers over their supply chains. Procurement managers at the mines indicated that supplier-training costs were “priced in” to their contracts, on which basis they are still competitive with international suppliers. The local labour and logistical costs offset the costs of training, management and quality control, OPM assumes. Asked how high local procurement as a percentage could reasonably go, most mine representatives claimed that they were near this level already, which is not surprising given the unusually high proportions of both local employment and procurement in the study.

## ALAC

The Asociación Los Andes de Cajamarca (ALAC) began as Yanacocha’s community outreach effort, but has since become an independent organisation with a seven-member Board of Directors. Yanacocha provides seed funding for ALAC, with the organisation raising additional funds from sources such as the IFC, Clinton Foundation, USAID and others. With sustainable development as its primary mission, the organisation works to build the capacity of numerous small businesses – many, but not all of which are Yanacocha suppliers. ALAC provides technical assistance, quality control, and identifies other areas where local firms need assistance.

“Our goal is that sustainable development is a responsibility shared by all,” said Violeta Vigo, ALAC’s Executive Director, “including community residents, local companies, and government. It can’t just be Yanacocha.” The organisation currently works with some 200 suppliers, helping to building their capabilities so that they can compete with large companies for contracts. As an example of ALAC’s success, Vigo cites the fact that in 2003, 70% of Yanacocha’s uniforms were made in Lima, while today that same proportion comes from Cajamarca – all from five local firms that ALAC helped to create. Aside from mining contracts, ALAC’s companies run businesses in both dairy and trout farming, among other areas. With the upcoming launch of the Minas Conga mine, ALAC will expand to work with suppliers and other companies in the new mine’s surrounding communities.

**Table 3: Companies and suppliers interviewed for the study**

Supplier	Location	Clients	Products/Services	Workforce	Revenues
El Aliso	Cajamarca	Yanacocha	Environmental and construction services	2005-2006: up to 100 2009: 20 2010: 70	Est. US\$1mn in 2011
PUNRE	Cajamarca	Yanacocha and its suppliers	Rental of heavy machinery	200, set to increase by 50% when construction of Minas Conga begins	Not reported
Peruvian Services	Cajamarca	Cerro Corona	Operation and maintenance of water plant	21	PEN* 1mn
Santa Maria Hualgayoc	Hualgayoc	Cerro Corona	Transportation and construction	6	PEN* 2mn
Aguas Termales	Huancarama	Community residents and tourists	Hot springs, baths, swimming pool	Not reported	US\$60k
Lyanfer	Quiruvilca	Lagunas Norte	Apparel (safety gear, polo and t-shirts, caps)	5	PEN* 70k
Ferreyros	Lima	Lagunas Norte	Authorised dealer in Peru of Caterpillar equipment	2,900	US\$12mn from Barrick
Servicios Multiples El Sauco	El Sauco	Lagunas Norte	Cleaning services for company offices	37	PEN* 113k
Cruz Verde	Quesquenda	Lagunas Norte	Bus transportation	12	Not reported
Transportes Jhordi	Trujillo	Lagunas Norte	Bus transportation	17	US\$70k from Barrick

\*Peruvian Nuevo Sol

# Conclusion

Mining has played a key role in the development of Peru's national and local economies. At a national level, the mining industry accounted for 60% (or US\$16.3 billion) of Peru's total export revenues in 2009. Gold mining's contribution continues to be significant, accounting for US\$5.6 billion in exports (for 2008) – with 60% of this amount coming from the four sample mines in our study.

The benefits of the mining industry to Peru's economy are far-reaching – well beyond the number of actual jobs being created or sustained. Because employees in the formal, large-scale mining sector are marked out by comparatively high skill sets (and therefore incomes), the knock-on effects for the communities in which they live are substantial.

Looking exclusively at the World Gold Council member company mines represented in our study, the picture is impressive. These four mines represented over 20% of total mining exports and 12% of total exports in Peru in 2009. In other words, more than one in every 10 dollars exported came from the World Gold Council company mines in our sample.

## Diverse local impacts

But, as we have shown in this report, the local impacts of our sample mines are equally significant. We recognise that there are some communities where there are conflicts around mining. Nonetheless, for most communities, spanning employment, procurement from local suppliers, community contributions and taxes paid, the benefits to local communities continue to be both diverse and valuable.

The four mines in our sample are directly benefiting the local job market, with Peruvian nationals expected to make up 90% of their total workforces in 2011. Of the US\$250 million that is expected to be paid in salaries between 2011-2014, community salaries account for more than US\$100 million. Based on the multiplier used for this study, we estimate that the indirect job creation impact of the four mines from 2005 to 2014 will have been approximately 8,000 annually.

In terms of local procurement, the four mines' expenditure with national suppliers averages 90% of their total procurement or nearly US\$1.4 billion per year from 2007 to 2010. In some years, this exceeds twice the total of all taxes paid by these mines. The local effects of this expenditure are just as noteworthy. 41% of all purchases from national suppliers went to community-based firms (with a value of US\$70 million).

However noteworthy, these indicators do not capture the impacts of the four mines on the individuals and families of the regions studied. The various interviews and case-studies included in this report highlight some 'human impact' stories about opportunities created by gold mining in Peru, with entire communities being given the opportunity to raise their standard of living through secure employment, training schemes and higher incomes.

# Appendix

## Data collection template

Data period	Notes and explanations	Units
Accounting period	Start date to expected closure date.	
Capital expenditure period	Years in which there has been, or is forecast to be, 'actual' capital expenditure (i.e. not 'commitments'). Capital expenditure includes ancillary facilities.	
Operational expenditure years	Years in which there has been, or is forecast to be, 'actual' operational expenditure (i.e. not 'commitments'). Operational expenditure includes processing, refining.	
Closure	Years in which there is anticipated to be expenditure on mine closure.	

Revenues		
Production volumes	Quantity of units sold for each material product (actual and forecast).	Gold (ounces) Copper (metric tonnes)
Sub-total sales by product	Sales volume multiplied by price per unit.	Gold (US\$ per ounce) Copper (US\$ per metric tonne)
<b>Total revenues</b>	Aggregate gross revenues across all material products.	US\$m

Royalties		
<b>Total royalty payments</b>	US\$ value of royalty payments per year (paid on gross revenues).	US\$m

Capital expenditure		
<b>Direct labour (payroll)</b>		
Head count	Physical number of staff on payroll in year, including FTE agency/contract staff.	#
National head count	Proportion of payroll staff who are national citizens.	%
Wage bill	Total annual wages bill for staff on payroll (base salary plus all social taxes, benefits/bonuses and including training).	US\$m
Training	Total annual training costs for direct employees and FTE agency/contract staff.	US\$m
National labour	% of wage bill paid to national citizens (professional estimate).	% US\$
Community labour	% of total annual wage bill paid to national citizens resident in project-affected area (a sub-set of National Local Content %) (professional estimate).	% US\$
<b>Services and works</b>		
Contracted services and works	Total annual actual expenditure on contracted/sub-contracted services and works, including EPC/EPCm contracts.	US\$m
National content	% of expenditure on contracted/sub-contracted services of domestic origin (use method most relevant to operation or % of CAPEX to nationally-registered service contractors) (professional estimate).	% US\$
Community content	% of expenditure on contracted/sub-contracted services located in, or sourcing labour from, project-affected area (a sub-set of National Local Content %) (professional estimate).	% US\$
<b>Equipment and materials</b>		
Equipment and materials	Total annual actual expenditure on suppliers of goods (equipment and materials), excluding EPC/EPCm contracts.	US\$m
National content	% of expenditure on goods of domestic origin (use method most relevant to operation or % of CAPEX to nationally-registered suppliers) (professional estimate).	% US\$
<b>Total capital costs</b>		



<b>Operational expenditure (by labour and goods)</b>	<b>Notes and explanations</b>	<b>Units</b>
<b>Direct labour (payroll)</b>		
Head count	Physical number of staff on payroll in year, including FTE agency/contract staff.	#
National head count	Proportion of payroll staff who are national citizens.	%
Wage bill	Total annual wages bill for staff on payroll (base salary plus all social taxes, benefits/bonuses and including training).	US\$m
Training	Total annual training costs for direct employees and FTE agency/contract staff.	US\$m
National labour	% of wage bill paid to national citizens (professional estimate).	%
Community labour	% of total annual wage bill paid to national citizens resident in project-affected area (a sub-set of National Local Content %) (professional estimate).	% US\$
<b>Services</b>		
Contracted services and works	Total annual actual expenditure on contracted/sub-contracted services and works, including procurement of goods where these form part of major management services or operations and maintenance contracts.	US\$m
National content	% of expenditure on contracted/sub-contracted services of domestic origin (use method most relevant to operation or % of CAPEX to nationally-registered service contractors) (professional estimate).	% US\$
Community content	% of expenditure on contracted/sub-contracted services located in, or sourcing labour from, project-affected area (a sub-set of National Local Content %) (professional estimate).	% US\$
<b>Equipment and materials</b>		
Equipment and materials	Total annual actual expenditure on suppliers of goods (equipment and materials), excluding procurement of goods where these form part of major management services or operations and maintenance contracts.	US\$m
National content	% of expenditure on goods of domestic origin (use method most relevant to operation or % of CAPEX to nationally-registered suppliers) (professional estimate).	%
<b>Total operational costs</b>		
<b>Community contributions</b>		
<b>Total community contributions</b>	Inclusive of compensation payments, social investment programmes, SME linkages programmes.	US\$
<b>Data period</b>		<b>Units</b>
Corporation tax		US\$m
Import duties		US\$m
Local/regional taxes		US\$m
Dividend tax		US\$m
VAT		US\$m
Withholding taxes	For example dividend, interest, technical assistance.	US\$m
Special taxes	For example special mineral taxes.	US\$m
<b>Total taxes</b>		
<b>Mine closure</b>		
Mine closure costs	Estimate of mine closure costs.	US\$m

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