

The social and economic contribution of gold mining



About the World Gold Council

The World Gold Council is the market development organisation for the gold industry. Our purpose is to stimulate and sustain demand for gold, provide industry leadership, and be the global authority on the gold market.

We develop gold-backed solutions, services and products, based on authoritative market insight and we work with a range of partners to put our ideas into action. 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 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, China, Singapore and the USA, the World Gold Council is an association whose members comprise the world's leading and most forward thinking gold mining companies.

About Steward Redqueen

Steward Redqueen is a consulting firm which aims to make business work for society. They enable organisations to measure and manage their economic, environmental, and social impacts by solving complex problems on integration of sustainability, quantification of impact, and creation of shared value. Out of offices in Amsterdam, Barcelona, Singapore, Stockholm, Washington D.C. they execute projects around the world for multinational corporations and financial institutions.

Since 2000, Steward Redqueen has completed more than 150 impact studies and evaluations for multinationals, development finance institutions, banks and other organisations in over 75 countries in Africa, Asia, Latin America, North America and Europe. These studies cover topics like economic growth, employment, greenhouse gas emissions, and social change. Using the best available data and modelling techniques, they help establish a factual basis for understanding and managing impacts. For more information: www.stewardredqueen.com

Steward Redqueen performed the data analysis and economic modelling, produced the quantitative results and drafted the initial narrative for the report. The Steward Redqueen team was led by Dr René Kim and included Magdalena Krzysztofik, Thomas Pons-Seguin, Tias van Moorsel and Toon Remmers.

Contents

Foreword	01
Executive Summary	03
Key facts on the social and economic contribution of gold mining	05
Gold Mining in the Global Context	08
The Economic Contribution of Gold Mining	15
Contributing to GDP	15
Gold mining as a proportion of total GDP	19
Growing government income	19
Supporting economic transformation	21
Supporting Livelihoods	25
Employing people	26
Increasing household incomes	27
Striving for gender equality	29
Developing skills	32
Investing in communities and contributing to the SDGs	33
Responsible Mining	36
Conclusion	40
Annex 1: Methods and Economic Model	41
Annex 2: Data Collection and Analysis	45
Annex 3: Defining Gold-Intensive Countries	47
Annex 4: Summary of Results by Sustainable Development Goal	49
Annex 5: Supplemental breakdown of data	51

For more information

Please contact:

Hannah Brandstaetter
ESG Programme Director
hannah.brandstaetter@gold.org
+44 20 7826 4701

Peter Sinclair
Senior Advisor
Peter.sinclair@gold.org
+44 20 7826 4700

Foreword



Rt Hon. Helen Clark
EITI Board Chair

This report is a welcome contribution to the data available on the extractive sector, and can play a role in informing debate on the policies which will shape its future.

This insightful report offers an analysis of value distribution from 31 large gold mining companies across 38 countries, in a diverse range of socio-economic settings.

Among the countries covered are nine developing economies – Burkina Faso, Ghana, Guinea, Guyana, Kyrgyzstan, Mali, Papua New Guinea, Suriname, and Tanzania – where gold accounts for from 21% to 80% of the value of goods exported. These nine countries are also among the 56 countries which have committed to implementation of the EITI – the global standard for good governance in the extractive sector.

In these countries in particular, the gold mining industry presents a window of opportunity for development. The report describes where this development potential can be centred – employment, contribution to household incomes, community investment, and the potential to increase gender equality and develop skills.

Quantifying these contributions underscores the opportunity presented by the development of extractives resources. It highlights the importance of good governance, substantiating the EITI's first principle – that the prudent use of natural resource wealth should be an engine for sustainable economic growth, contributing to sustainable development and poverty reduction.

While there is much helpful information in the report, three opportunities stand out where there is potential for governments, companies and civil society to work together to improve how citizens can benefit from gold mining. Such work can be supported by multi-stakeholder platforms, such as the EITI.

The first is the need to reduce emissions to meet the targets of the Paris Climate Agreement. Along with previous work undertaken by the WGC on the emissions profile of the gold mining sector, the report shows that the contribution of gold mining to global emissions is substantial, and is more than the average for other economic sectors. It highlights that urgent action to reduce scope 1 emissions is needed. It also highlights there is an opportunity to work with governments to reduce scope 2 emissions – currently at 44% of total sector emissions – through the decarbonisation of grid sources of electricity. We welcome this clarity on the emissions profile of the gold industry, and urge WGC members to work with host governments to identify opportunities for integrating renewable energy projects into new and existing operations. We stand ready to work with industry and governments to support EITI multi-stakeholder groups in the production and use of data to support debate on this critical topic.

Second, the report highlights opportunities to develop livelihoods at the local level. According to the report, a total contribution of USD 37.9 billion (bn) is made by the 31 WGC companies to 38 countries, and in eight countries the contribution represents more than five per cent of all government income. The EITI has seen strong demand from local communities to increase transparency of the collection and allocation of subnational payments, to ensure that they meet their intended purpose of contributing to sustainable local development.

In countries implementing the EITI, disclosure requirements cover this data, and are now complemented by the WGC's Principles for Responsible Gold Mining which integrate EITI reporting principles into the requirements for WGC member companies. We look forward to seeing how their implementation will further increase sector transparency and governance.

Third, the report's focus on gender diversity is welcome. The 2019 EITI Standard introduced requirements for EITI countries on the reporting of gender for the first time. The level of reporting on workforce diversity is increasing; a recent survey showed that sixty per cent of EITI implementing countries now publish gender-disaggregated information, and that women make up 24 per cent of multi-stakeholder group members and 36 per cent of national coordinators. The report highlights clear opportunities for representation of women in the gold mining industry to be increased, particularly in senior roles. Momentum to achieve this will support more inclusive sector governance and have an impact on development indicators more generally.

These entry points for progress are encouraging. Yet the positive impacts discussed in this report can only be realised in the absence of corruption and elite capture of resource revenues. We therefore urge all WGC members to renew their support for anti-corruption initiatives, in line with their support for the principles of the EITI, as embodied in the Responsible Gold Mining Principles.

There are clear opportunities for such leadership. In September this year, a group of companies, including a leading gold mining company, declared their support for beneficial ownership reforms, including the establishment of public beneficial ownership registers. Other companies have taken similar steps to lead by disclosing mining contracts, thereby recognising the value of publishing contracts in reducing the potential for corrupt deals.

These are two examples of where companies have gone beyond legal requirements to promote transparency and accountability. Actions such as these can make a difference in reducing the potential for corruption and improving the net benefit of revenue flows from mining resources for citizens.

Helen Clark served as Prime Minister of New Zealand from 1999-2008, and as a Member of the New Zealand Parliament from 1981-2009. Prior to that she taught in the Political Studies Department of Auckland University, New Zealand. From April 2009 until April 2017, Ms. Clark was Administrator of the United Nations Development Programme and Chair of the UN Development Group. She continues to be highly engaged in issues across the sustainable development spectrum from gender equality and women's leadership to climate action, health and drug policy, open government, peace and justice, and more.

Executive Summary

Gold mining occurs on every continent except Antarctica, often in remote and impoverished areas with little infrastructure or alternative economic activity. This evidence-based report attempts to demonstrate how gold mining can support the economic development of local communities and national economies. What is clear from this research is that a gold mine, if operated responsibly and in the context of a well-governed regulatory regime, can deliver significant and lasting economic and social benefits to host countries and communities.

This report provides quantitative insights into how World Gold Council (WGC) member companies contribute to economic advancement and improve livelihoods at a global, national and local community level. The report aims to contribute research and analysis in order to inform and deepen the ongoing discussion of the overall benefits of gold mining and to consider how those benefits can effectively be distributed, supported and sustained.

This report is based on 2020 data from 122 operations and 81 non-operating sites of 31 of the 33 WGC member companies across 38 countries. The data must be approached with one large caveat: it is a one-year snapshot. Gold mining is, by nature, a multi-year business, involving high capital outlays upfront, long lead times and uncertain returns. Even though 2020 was a year of unprecedented challenge due to the COVID-19 pandemic, the gold industry fared relatively well, underpinned by a record-high gold price, and with operations largely continuing, albeit under strict health protocols.

Against this background, the WGC member companies produced 34.5 million ounces of gold and were able to contribute close to US\$38.0bn directly and indirectly to

host nations. Many industries were shut down or severely curtailed during the pandemic, bringing economic hardship to many nations and millions of people. The fact that the mining industry was largely able to continue operating meant that the social and economic contribution of the sector – including sizable taxes and royalty payments to governments – were brought into even sharper focus and very much welcomed, especially by governments reeling from the pandemic-induced fiscal crisis.

The sector's contribution to government revenues was only a small part of the overall benefit generated. As the report outlines, significant sums were contributed in the form of payments to suppliers, employees, communities and Indigenous Peoples, as well as the economic spin-offs that come with this type of large-scale industrial activity. These multipliers are particularly important given the remote location of so many gold mining operations, and the frequent lack of significant alternative economic activity. Less quantifiable benefits also include skills building, improved livelihoods, enhanced gender equality and advanced economic transformation.

The report highlights include:

- In 2020, WGC member companies directly paid US\$8.7bn in employee wages and US\$7.6bn in tax payments to governments in 38 host countries.
- On top of this, direct payments of US\$26bn were made through in-country procurement which, when run through our economic model, translates to US\$21.6bn in value added to local suppliers. Added to the US\$16.3bn in wages and taxes, this means a total of US\$37.9bn was contributed to the GDP of these 38 countries.
- A large portion of value created stays in country: for every dollar of gold production, at least 63 cents ends up as salaries, taxes or income for local business owners in the host countries (it may be more – there are limitations in the data in identifying the geographic location of all recipients of money distributed).
- For every dollar spent on imports, close to five dollars are spent on sourcing from within the host countries.
- In 2020, the GDP contribution of WGC member companies and their supply chains in countries heavily reliant on gold mining is comparable to the quantum of Overseas Development Assistance those countries receive.
- In 2020, WGC member companies directly employed close to 200,000 people and supported a further 1.2 million jobs through their local suppliers. These 1.4 million jobs induced another 700,000 jobs in host country economies. In other words, every job in the gold mining industry supports six more, or close to ten more if induced jobs are included.
- A strong focus from WGC member companies on local¹ hiring in recent years has led to demonstrable results, with local employees making up 95% of the workforce, halving the percentage of expats in the workforce (from 10% to 5%) over the past 7 years.
- Gold mining employees are well paid. Wages among WGC member companies are on average six times higher than the national average.
- An estimated 17.3% of the workforce of WGC member companies are women, a number that has grown significantly in recent years but is still unacceptably low (even if higher than the 5-10% average of the overall mining sector).
- The industry continues to evolve and improve its ESG performance, as reflected in the adoption of the Responsible Gold Mining Principles by all WGC member companies and several other leading gold miners. In 2020, WGC member companies contributed \$437.8 million (mn) to communities and Indigenous groups and continued to help advance the UN Sustainable Development Goals.
- With respect to climate change, the gold industry is currently an above-average emitting industry, but there is a credible pathway to decarbonisation in order to align with the Paris 1.5 targets.

As global expectations around Environment, Social and Governance (ESG) performance continue to increase, driven by societal challenges such as climate change, inequality and the COVID-19 pandemic, sustained efforts will be needed to bridge existing gaps. Gold mining companies provide opportunities to transform mineral wealth into the socio-economic development in the host communities where they operate. However, grasping those opportunities requires active and deep co-operation with communities and governments in host countries.

¹ For the purpose of this report local means in-country.

Key facts on the social and economic contribution of gold mining

When undertaken responsibly, gold mining makes a very significant contribution to social and economic development of host countries and communities. In this section, we set out a number of key facts and perspectives on how this is achieved.

Fact #1. Gold mining creates well paid, local jobs in the countries of operation

Gold mining companies create local jobs, both directly and indirectly. Our data shows that in 2020, the 31 WGC member companies included in the survey directly employed close to 200,000 people. The number of jobs will vary over time depending on the phase of the mine and production levels. The numbers also differ depending on the size and type of mining operation (open pit or underground mining). These jobs are well paid, on average, six times the national average wage. 95% of the people who work at our member companies' mine sites are nationals of the country where they work, with the remaining 5% being expatriates. In addition, gold mining catalyses many more indirect jobs in the wider economy. Our members supported 1.2 million jobs through their local suppliers. The re-spending of salaries earned in the gold supply chain supported another 700,000 jobs in the wider economy. Responsible gold miners recognise the mutual benefits of integrating as much as possible into the local economy, using local people and supply chains. This both supports their 'license-to-operate' and enables the community to benefit from the economic and social development of the mine.

Fact #2. Gold mining creates valuable tax revenues in the countries of operation

Gold mining companies make significant contributions to host country government revenues. In many low-income developing countries, these taxes and royalties constitute a notable proportion of the national tax base, enabling both mining and non-mining areas to benefit from a country's mineral endowment. In 2020, WGC member companies paid US\$7.6bn in taxes to their host governments in the form of corporate, employment and other taxes, and royalties. These payments are governed by the fiscal regimes and operating agreements that companies must adhere to in order to access a mineral deposit. Furthermore, WGC member companies follow strict regulatory standards in relation to anti-corruption practices, codes of conduct and financial disclosures. Encouragingly, many gold mining jurisdictions are showing signs of better governance, which is vital to ensure that tax revenues benefit the country's citizens. Major gold-mining companies have been at the forefront of the implementation of the Extractive Industries Transparency Initiative (EITI), a global standard for the mining and energy industries that promotes revenue transparency and accountability.



Image courtesy of Golden Star.

Fact #3. Gold miners generate sustained benefits for local communities

Operating an ‘enclave’ operation isolated from the local community is not a viable option for any gold mining company. To be successful, they have to do just the opposite: build support and generate sustainable benefits for local people and communities. This is done by building relationships and trust. Increasingly, gold mining companies are acting as partners in development, helping turn mineral wealth into a means of advancing human development. Gold mines bring opportunities and act as an engine of economic growth, especially in poorer, more remote locations where there are often few alternative avenues for economy activity and community advancement. As this report shows, in 2020 WGC member companies spent US\$437.8mn on community investment, which is on average more than \$14mn per company. This is in addition to the US\$7.6bn paid in taxes that can be used by governments, for example to improve public services, education, healthcare and infrastructure. Gold mining companies increasingly work side-by-side with local and regional governments when prioritising, planning and implementing socio-economic development initiatives, and these partnerships will drive further progress.

Fact #4. Large-scale gold mining is highly regulated and operates within strict government controls

Gold mining only takes place with the formal approval of the host government. In most places, before a mine can be constructed, the company must conduct a detailed Environment and Social Impact Assessment (ESIA) – often a multi-year process, including detailed baseline and trade-off studies across a wide range of environmental and social topics areas, as well as extensive consultations and the development of mitigation plans with the impacted community. The ESIA is then reviewed by regulators and subject to government approval. The general level of ESIA is now extremely demanding, usually incorporating a wide set of considerations including water, tailings management, biodiversity and Indigenous rights. This is in stark contrast to artisanal and small-scale gold mining which, although providing livelihood for millions, is often informal (or illegally) conducted and very poorly regulated. As a result, ASM is often, unfortunately, associated with social conflict, poor safety standards, human and labour rights violations, child labour, environmental degradation, and exploitation by organised crime.

Fact#5. Countries and communities benefit much more from gold mining now than in the past

While historically, mining operations have not always led to improvements in human and social development, as mining standards and expectations evolve, governments and mining companies are much more likely to insist on the application of stringent environmental, governance and social protocols as a condition of operating. Those that don’t follow high standards of operational and ESG practices are unlikely to be successful in the long run. Companies are acutely aware that operating responsibly is synonymous with good business. The expectations are that the benefits of gold mining are shared equitably among the different stakeholder groups particularly, as we show in this report, those in country, including local employees and suppliers, communities and governments. In 2020, a total of US\$37.9bn was added to the GDP of the 38 host countries from gold mining. For every dollar of gold production, at least 63 cents end up as salaries, taxes or income for local business owners in host countries. Gold mining companies also support the economic transformation of countries through local procurement and skills transfer, including helping improve resource governance.

Fact #6. Gold mining companies operate to high environmental or socially responsibly standards

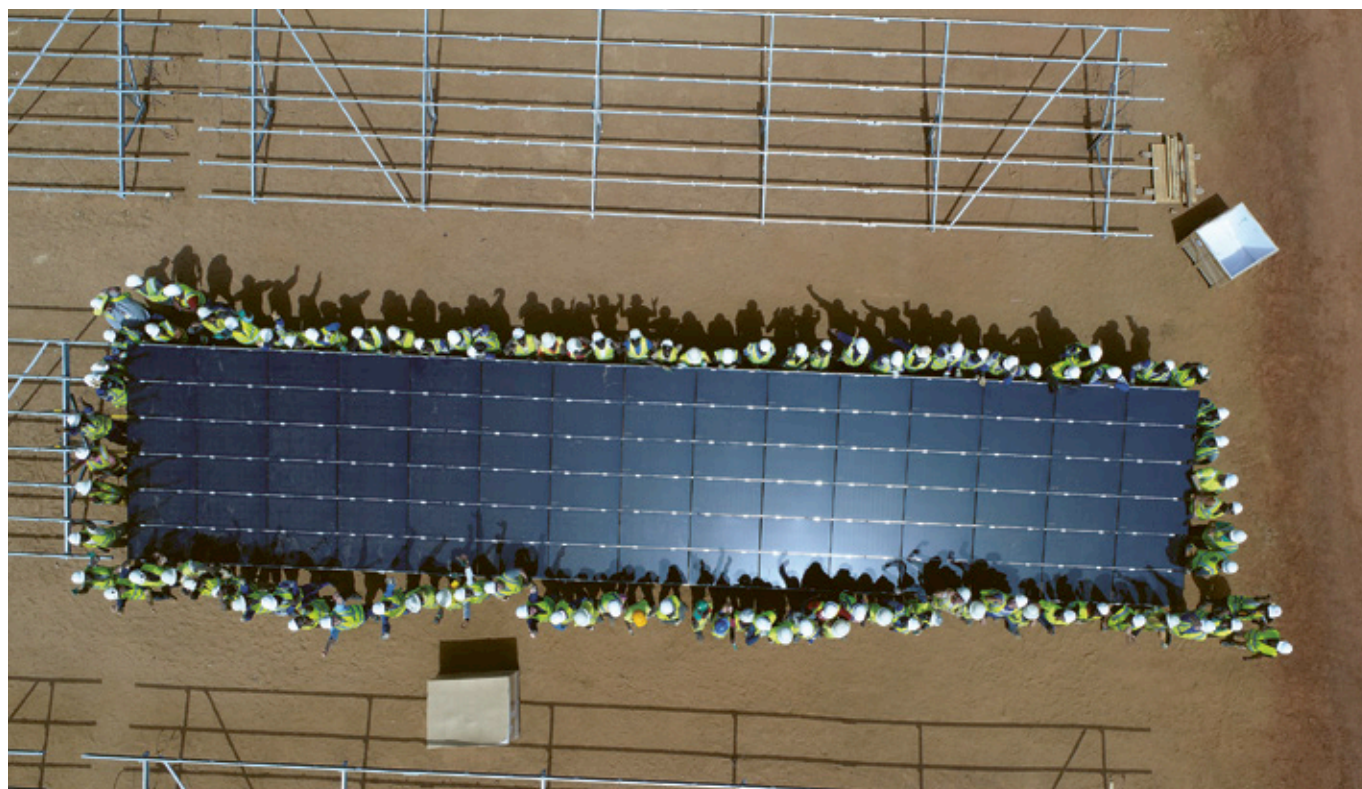
Responsible gold mining companies are committed to high environmental and social standards – both because it is the right thing to do, but also critically, because it is well recognised that it helps reduce their risks, strengthens the support of host governments and local communities, and underpins a company’s long-term operational and financial performance. In 2019, the WGC, working closely with its members, and following an extensive consultation period, launched the *Responsible Gold Mining Principles (RGMPs)*, a framework that clearly sets out what constitutes responsible gold mining. The RGMPs cover 51 Principles that speak to all material environmental, social and governance issues for the gold mining sector. Implementation status has to be publicly reported and conformance is subject to assurance by independent experts. Conformance with the RGMPs is obligatory for WGC members and a number of other gold mining companies have also decided to implement the RGMPs to demonstrate to their stakeholders that they are mining responsibly. The RGMPs, and other responsible mining codes, reflect a deep commitment from the mining industry to operate responsibly.

Fact #7. Gold mining has a credible pathway to net-zero emissions

Large-scale gold mining contributes to greenhouse gas emissions, although 2019 estimates suggest its share of total global carbon emissions stands at 0.2%.² Virtually all emissions occur within the mining process and the majority of those are related to the generation or purchase of power. This means that if the gold mining sector can be de-carbonised, the entirety of the gold supply chain will be. Moreover, the news is that there is plenty of opportunity for doing so. As well as looking to use energy more efficiently, the gold mining industry is seeking to lower carbon energy sources, including significant adoption of renewable energy. There are an increasing number of examples where the clean power supply for a mine also benefits surrounding communities. Our analysis shows that gold miners have a credible and cost-effective pathway to reach net-zero carbon emissions by 2050 in alignment with the Paris Agreement.

Fact #8 Gold is a unique and valued metal which contributes positively to society

Gold is a unique precious metal which has emotional, cultural, functional and financial value. It is purchased around the world for a range of different reasons, influenced by utility, socio-cultural factors, local market conditions and wider macro-economic drivers. Gold is increasingly used in a wide range of technological applications, from cell phones and medical testing kits to vehicle air bags. Gold is the ultimate recycled asset – with virtually all the gold mined to date still in existence in one form or another. However, as long as there is gold in the ground and it is so highly valued, it will be mined. This is especially true in developing countries, where gold resources are recognised as a critical source of economic opportunity and growth. What is critical is that gold is mined in a way that it becomes a true “driver of development”. As this report demonstrates, responsible gold miners create jobs for nationals, help build infrastructure and support local communities, as well as make sizeable tax and royalty payments. Responsible gold mining should be encouraged as a means to support social and economic development.



Installation of solar panels at Essakane. Image courtesy of IAMGOLD.

2 www.woodmac.com/press-releases/gold-miners-on-track-to-align-with-2c-climate-target-by-2030/

Gold Mining in the Global Context

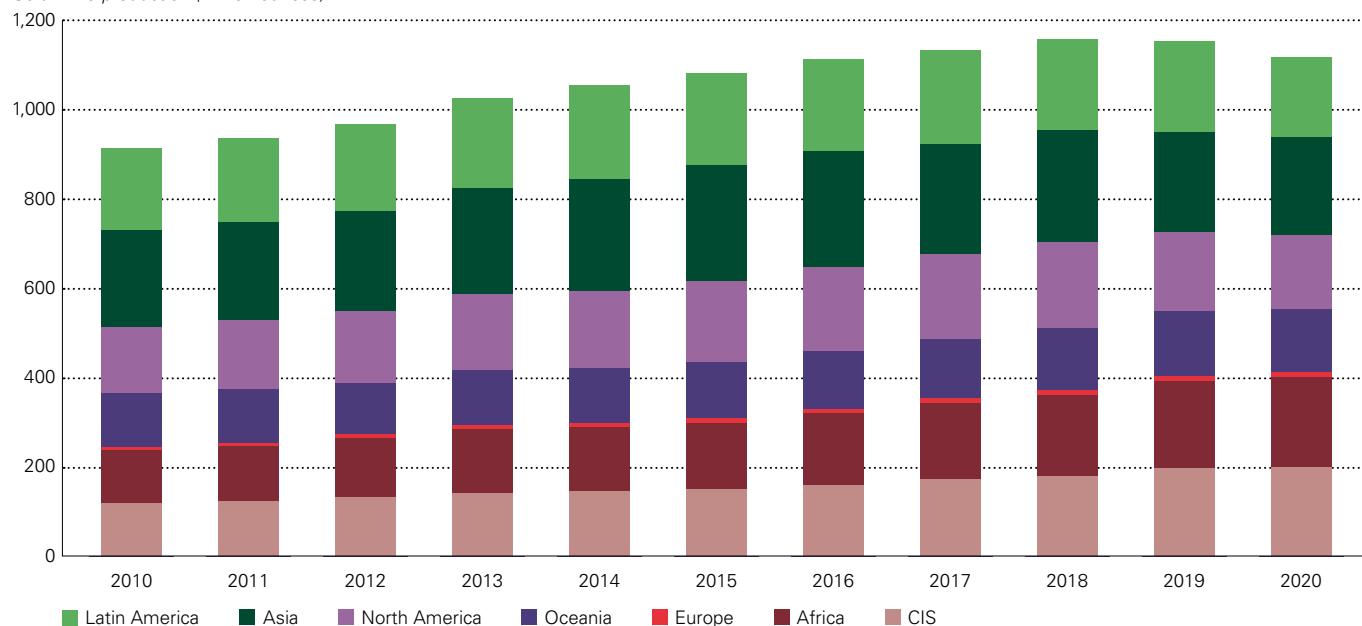
This section provides an overview of the gold sector in terms of global production, how large-scale mining (LSM) differs from artisanal and small scale (ASM) mining and how countries with gold mining can be categorised based on the importance of gold mining to their economy.

1. Large-scale mining (LSM) is responsible for approximately 80% of all newly-mined gold production. WGC members account for almost 40% of LSM.

2. In 2020, WGC members produced 34.5 million ounces of gold, 29% of which came from lower-income countries and 22% from countries whose economies are gold-intensive.

Chart 1: Gold mine production (in million troy ounces) per region over the period 2010–2020³

Gold mine production (million ounces)



Source: Metals Focus, World Gold Council

³ There are 32,151 troy ounces of gold in a metric tonne.

Gold mining is a global business that has become increasingly geographically diverse, with no single region dominating production (**Chart 1**). In 2020, China produced almost 11% of world production, closely followed by Russia (10%) and Australia (9%).⁴

Between 2010 and 2018, gold production increased 22%, with growth primarily coming from production growth in Africa and the Commonwealth of Independent States (CIS). Since 2018, there has been a slight decrease, which is a sign that many existing mines are becoming depleted and few new mines are coming online. In 2020, production was initially scaled back due to the restrictions associated with the COVID-19 pandemic, although it didn't have a major impact on year end production in most countries.

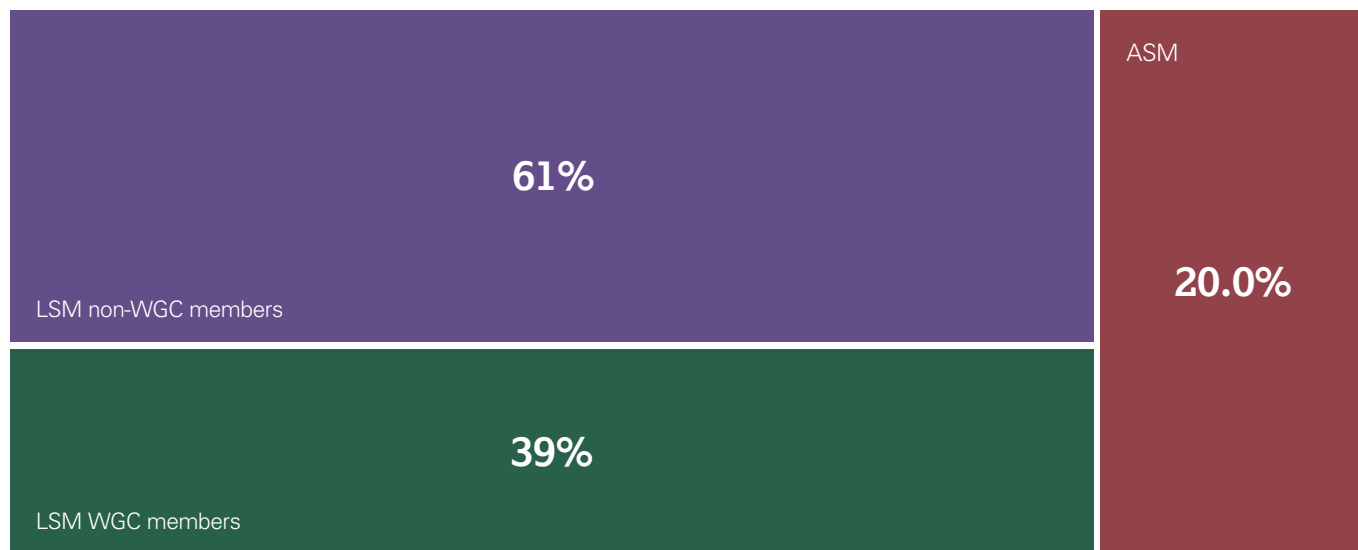
LSM is responsible for roughly 80% of the newly-mined gold output globally, with ASM making up the remaining 20% (see **Chart 2**).⁵ WGC members account for almost 40% of LSM gold production.

Large-scale mining (LSM) vs Artisanal and Small-scale Mining (ASM)

LSM requires significant upfront capital well before production begins or any returns are realised, as well as further sustaining investment, often over long periods of time. LSM is typically governed by strict regulatory controls, permits and inspections that include rigorous operating requirements, and are subject to performance standards in areas such as health and safety and management of environmental and social impacts.

ASM, on the other hand, is labour intensive and typically uses relatively simple production methods. It provides livelihoods to millions of people but often occurs outside formal legal structures. This therefore poses a variety of dangers, including health and safety hazards and significant issues relating to the use of mercury, including water pollution (mercury is not used in LSM). As a result of weak regulatory oversight, ASM is often associated with human and labour rights violations, the activities of organised criminal groups in some regions and poor safety and environmental practices.

Chart 2: Share of global gold production in 2020



Source: World Gold Council⁶

⁴ More detailed country-specific production data can be found in the interactive gold mining map provided by the WGC at www.gold.org

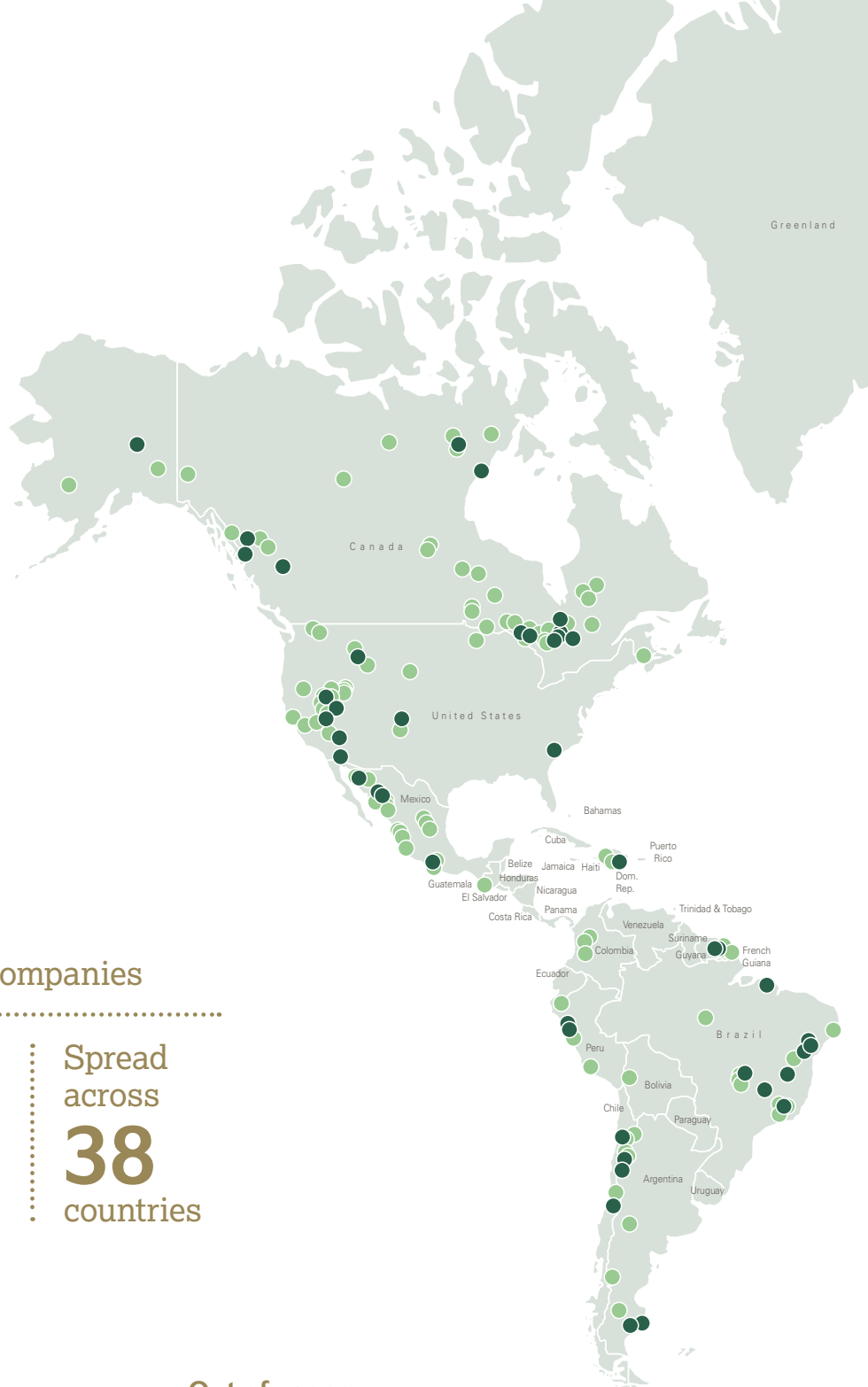
⁵ www.planetgold.org/tackling-challenges-interface-between-large-scale-and-artisanal-and-small-scale-mining. Though it is hard to exactly quantify ASM production.

⁶ ASM production is difficult to quantify exactly. Because of the informal nature of the industry, production volumes are not recorded in official accounts. The 20% figure is a widely-accepted rough estimate.

Chart 3: Location of WGC member mines

- Producing mine sites
- Non-producing sites

Source: World Gold Council



28 WGC member companies
3 royalty/streaming member companies

Producing mines	Non-producing sites	Spread across
112	81	38
		countries

Scope of the Report

The data used to compile this report comprises:

- 28 WGC member companies producing 34.5 million ounces of gold;
- 3 royalty/streaming member companies;⁷
- 112 producing mines and 81 non-producing sites (including head offices) spread across 38 countries (see **Chart 3**).⁸

Out of scope

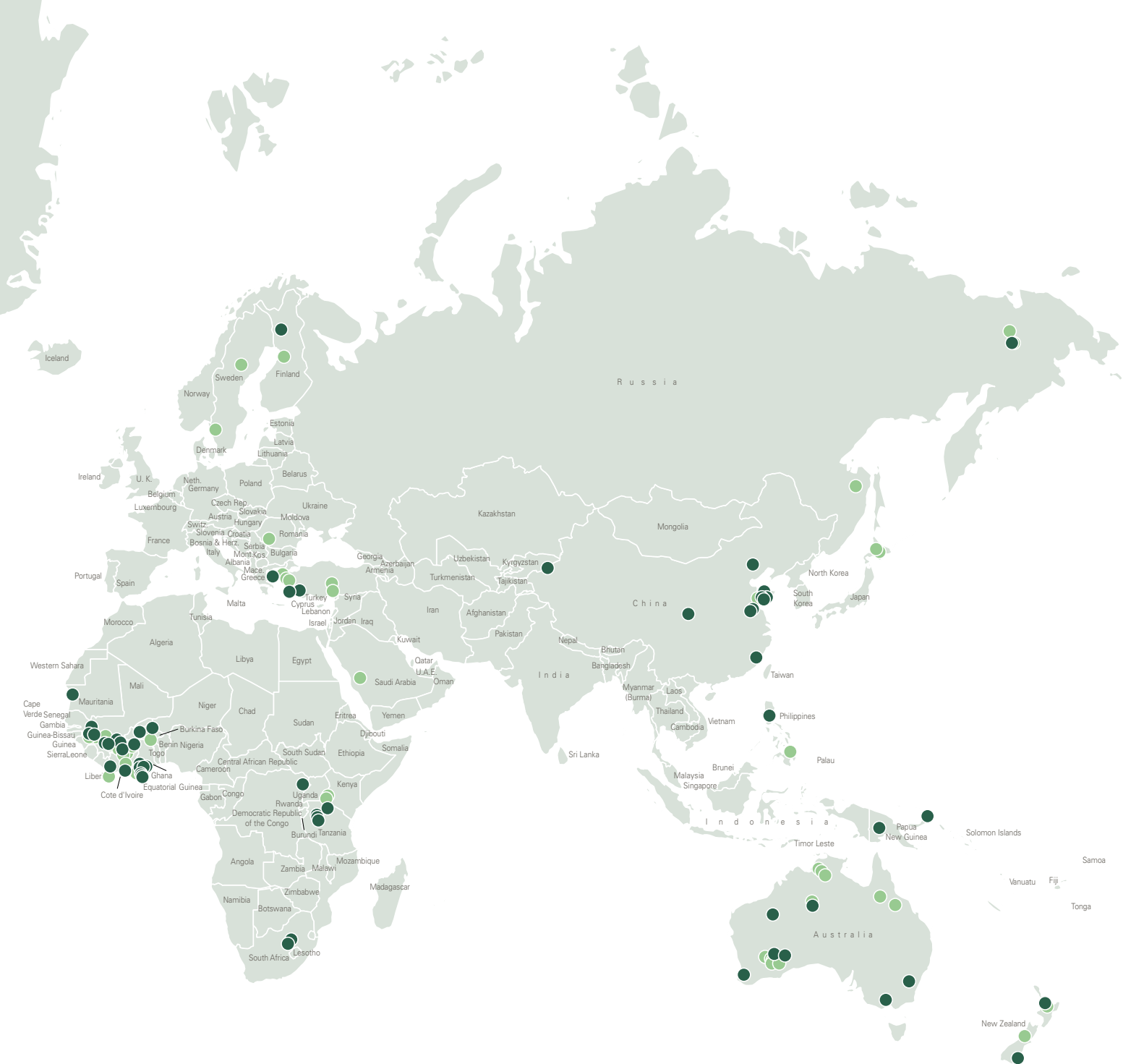
- Gold produced by non-WGC members, ASM and gold from recycled sources.

The importance of natural resources in general, and gold mining in particular, varies greatly between the 38 countries in this report. By adapting the methodology of the International Council on Metals and Mines (ICMM),⁹ and using publicly available data, we have categorised the 38 countries into three groups:

7 Royalty/streaming companies provide upfront financing for mining companies in return for a royalty or the right to purchase all or a portion of the mining company's production. For these companies, head office data was used.

8 Member companies may have a non-producing presence (e.g. an exploration project, closed mine site or regional office) in countries that are not included in the scope of the report. However, every country where member companies produce gold is included.

9 We adapt the methodology used by the ICMM to capture the economic importance of mining and gold mining activities in a country. A more detailed description of the methodology is provided in **Annex 3**.



1. **Gold-intensive** – where a significant portion of exports are from gold mining;
2. **Mining-intensive** – where a significant portion of the country’s exports are from mining, though not necessarily gold mining;
3. **Non-mining intensive** – where a relatively small proportion of the country’s exports are from gold mining.

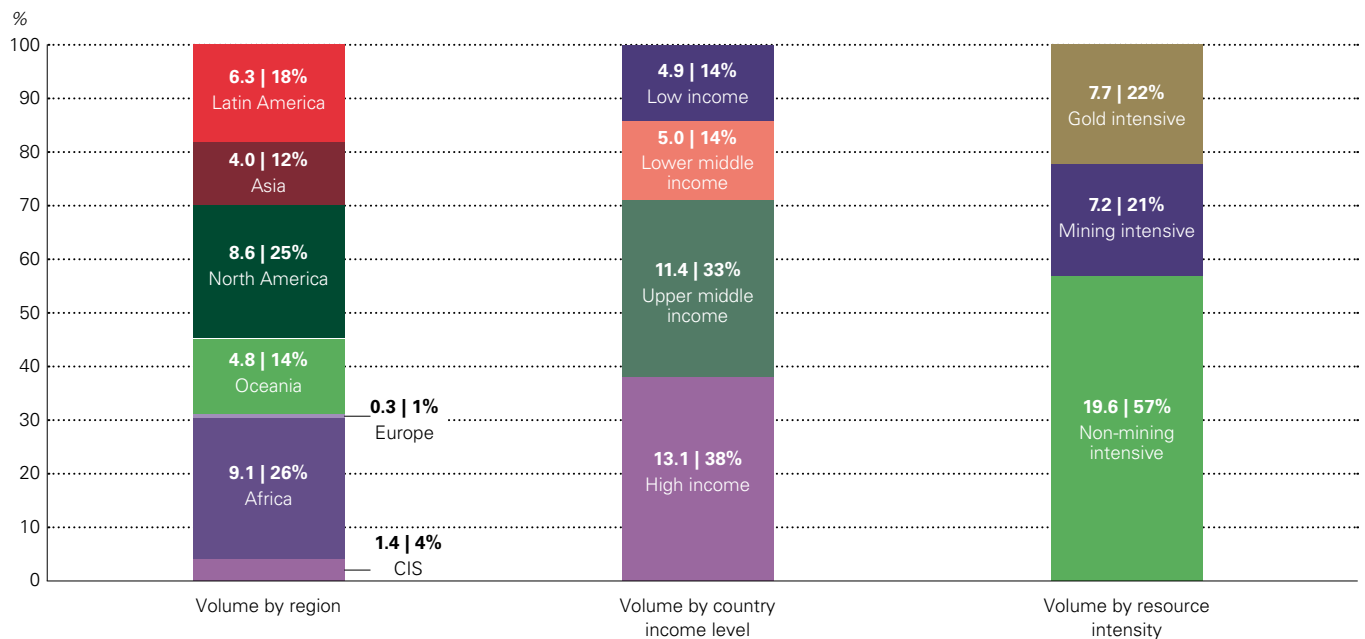
There are nine gold-intensive countries covered in this report: Mali, Suriname, Guinea, Burkina Faso, Guyana, Papua New Guinea, Ghana, Kyrgyzstan and Tanzania, in all of which gold makes up more than 20% of total exports (See **Annex 3** for details on how these categories are defined).

In **Chart 4**, we break down the 34.5M ounces of gold produced in 2020 by WGC members by country income level and mining or gold intensity. This reveals that:

- Over 70% of production from WGC member companies takes place in upper-middle and high-income countries;
- Gold-intensive countries produced 7.7 million ounces of gold, or 22% of all production in the scope of this report;

- Even though the majority of WGC gold production comes from higher-income countries, the relevance of gold production to the economies of lower-income countries is much greater.

Chart 4: Breakdown of 34.5 million ounces of gold production by WGC members by region,¹⁰ country income level and mining or gold intensity



¹⁰ North America data includes Canada and the USA. Mexico is included in Latin America.

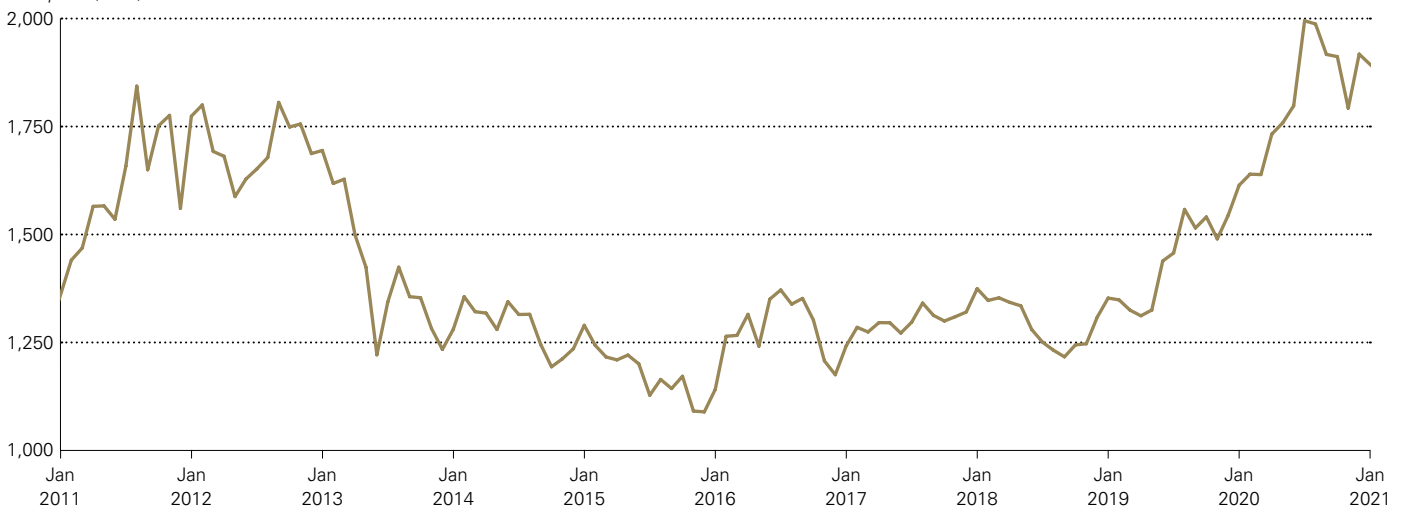
Gold price and the mining life cycle

When discussing mining, it is also important to reflect on the life cycle of a mine. The data collected for this study comes from 2020. As a result, it reflects the strong gold prices seen during that year, which led to revenues for gold miners that were significantly higher than in previous years. In August 2020, gold reached an all-time high

of US\$2,067.15 per ounce.¹¹ This was 27% above the average for the past ten years (**Chart 5**). However, this did not lead to a material increase in gold production levels – as we say in the intro gold production was not materially affected by Covid. It takes 10-20 years to open a new mine, including the permitting and construction phase, so it is not feasible to increase production in the short term when the gold price rises.

Chart 5: USD Gold Price January 2011 to January 2021

Gold price (USD)



Sources: FastMarkets, ICE Benchmark Administration, Thomson Reuters, World Gold Council

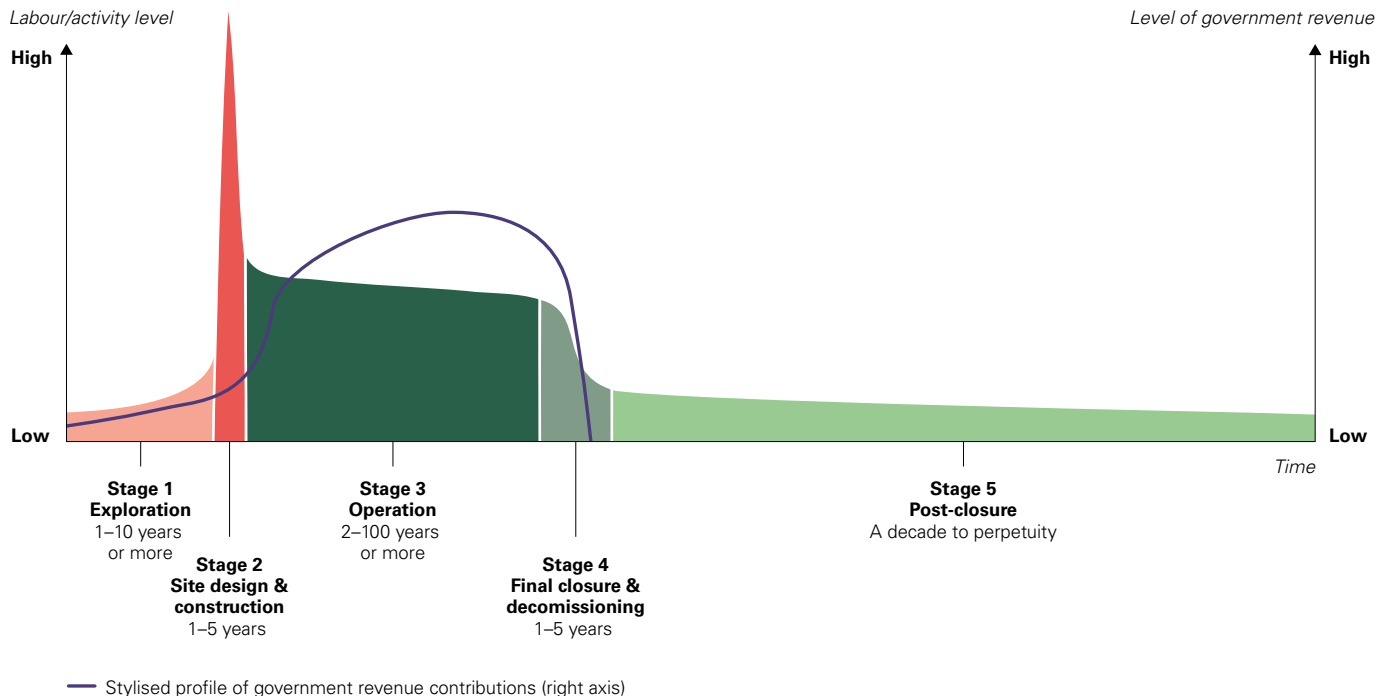
¹¹ Based on the LBMA Gold Price PM as of 6th August 2020.

The life cycle of a gold mine

The ICMM diagram below (**Chart 6**) shows a stylised representation of the typical mining life cycle, depicting labour/activity levels and government revenue contributions. For the typical mine, cashflow is positive only during the Operation Stage (Stage 3), when the revenue from production minus the cost of production is positive. To make the overall investment economically viable, these positive cashflows during operations also need to cover the costs from the other four stages (1, 2, 4 and 5), when revenue is zero and cashflows are negative.

The level of the expenditure during these four non-revenue stages mimics the labour and activity levels in the graph, with a sizable peak during site design and construction, with costs then tapering off after decommissioning. This context is important, as the data in the report is a snapshot in time during the operation stage (4) and the 'residual' shown in **Chart 8** does not take into account the other costs that need to be covered during the non-operational stages.

Chart 6: Life cycle of a gold mine



Source: ICMM, The Role of Mining in National Economies

The Economic Contribution of Gold Mining

In this section, the economic contribution of WGC members to the economy of host nations is described, focusing on their contribution to GDP and government revenue, as well as how they support the economic transformation of host countries. The main points include:

1. **A large portion of value created stays in country:** Of the US\$60.1bn revenue from gold production by WGC member companies, **US\$37.9bn (63%) contributed to the GDP of host countries.** This equates to almost US\$1,100 in value added locally for every ounce of gold produced.
2. **The contribution of gold mining is significant, especially in smaller developing economies, where it is roughly the size of Overseas Development Assistance (ODA).** WGC members support more than 3% of GDP in five of the 38 countries through their mining operations, and in 8 countries they fund more than 5% of all government income.
3. **The impact of the sector goes well beyond direct gold mining.** WGC members contribute to the economic transformation of their host countries by increasing the productivity of existing sectors, catalysing private and public investment, and helping support the good governance of revenues.

Contributing to GDP

WGC members and their supply chains (including on-site contractors) create employment and generate incomes in the host countries in which they operate. These impacts can be quantified by tracing the money flows coming from WGC member companies. **Chart 7** displays this schematically. The direct impact includes paying salaries to employees, and taxes and royalties to governments. The indirect impacts include the purchase of goods and services from local companies,¹² which in turn spend money on their suppliers, and so on. All the companies in the supply chain employ people, pay salaries and taxes, and generate business incomes. Tracing the payments one step further, all the direct and indirect salaries paid in the host country are being spent on goods and services. While this doesn't create new net incomes, it does support employment,¹³ which is the induced impact. The sum of all incomes (i.e. salaries, taxes and local company incomes) paid either by the WGC member company or a supplying company is equal to the value they create.

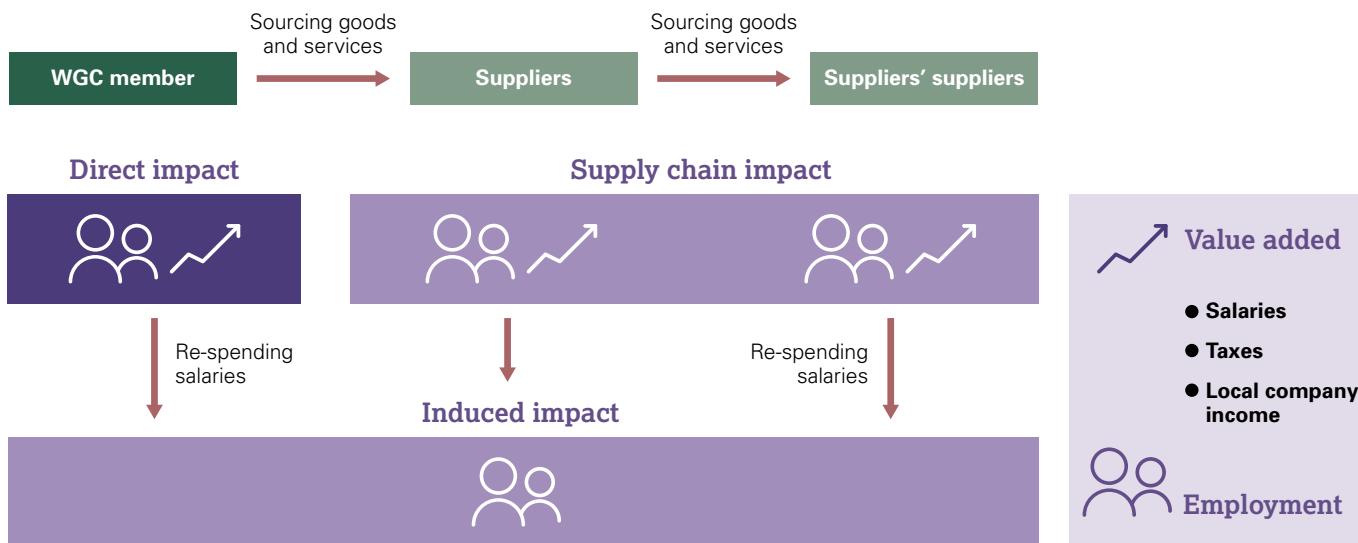


C.P. de Santa cruz de Oyo Oyo, Ichuña, Moquegua.
Image courtesy of Compañía de Minas Buenaventura

12 These are companies that are registered in the country and fiscal residents (i.e. pay tax in that country). The input-output model used adjusts for local companies that are effectively importers that do not have a significant 'value added' presence in the country.

13 The salaries in the supply chain have already been counted as income and their spending is a 'redistribution' of incomes. For example, buying food from a local store simply redistributes the income from the buyer to the shopkeeper (although it does support the employment of the people working in the shop).

Chart 7: Value added and employment impacts of WGC member’s supply chain



In any country, all the direct (WGC-member) and indirect (supply chain) incomes together constitute the total value added (i.e. all salaries, taxes and local company incomes) of the gold mining supply chain. This value added is the contribution to a country’s GDP, as GDP is the sum of all value added produced in a country.

WGC member companies provided information on their payments to governments (taxes) and employees (wages) in each of the countries in which they operate. They also provided data on payments to suppliers, including local procurement and foreign purchases (imports), and payments to foreign capital providers for each country. The local procurement data has been routed through country-specific ‘Input-Output’ (I-O) models to estimate the indirect value added related to the mining companies’ local supply chains (see **Annex 1** for a detailed description of I-O model and **Annex 2** for more information on the data collection).

The ‘value added’ approach to measuring economic activity is a more accurate and insightful measure than the ‘output’ approach (which simply adds local supplier payments to other company payments) to calculate output. This is because the value added approach captures the element of local sourcing (output produced by local companies) that generates incomes in the host country. For example, the value added of a local trading company that imports all its goods is much less (and generates much lower incomes) than a company that produces locally. **Annex 1** includes a more detail description of the model and further explains the difference between value added and output approaches to measuring economic activity.

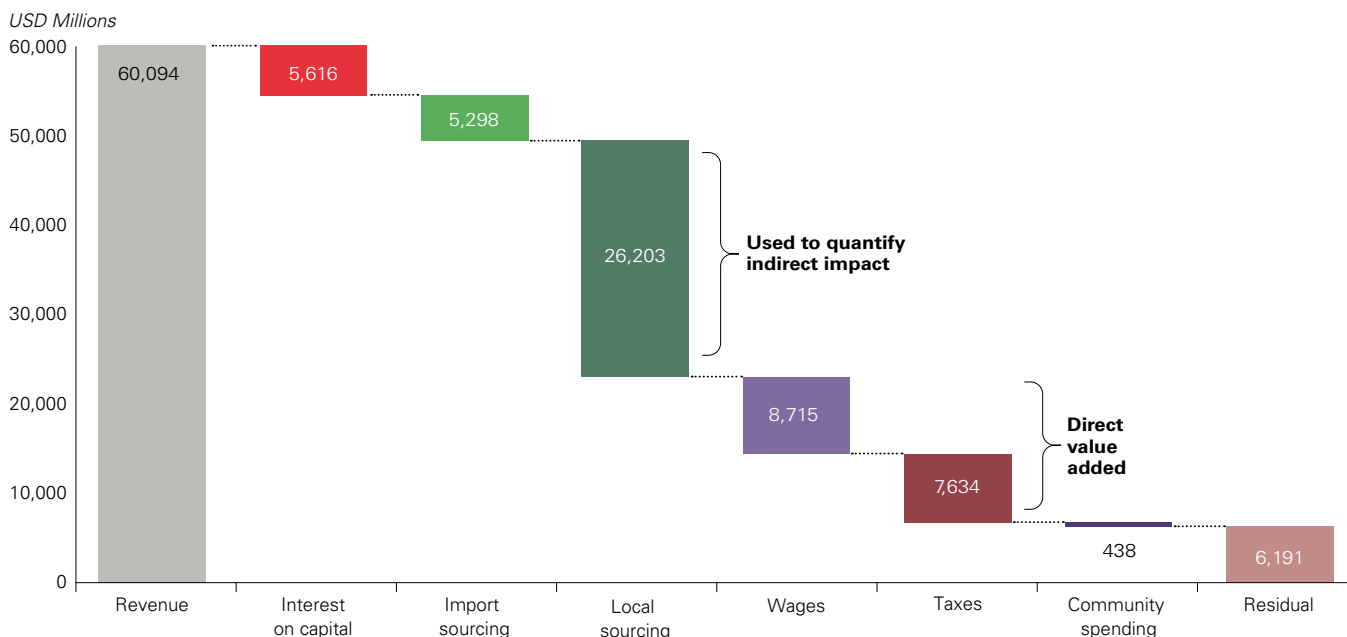
In **Chart 8** we breakdown the aggregate revenues and costs of the WGC member companies which reveals the following:

- Of the US\$60.1bn gold production value of WGC members (i.e. aggregate of company revenues), more than half is spent on procurement, US\$5.3bn on imports and US\$26.2bn on local suppliers in the host countries;
- This means that for every dollar spent on imports, close to five dollars are spent on sourcing from within the host countries;
- Foreign providers of capital – typically, investors and lenders from which the company borrowed money to build the mine – had US\$5.6bn returned to them.¹⁴
- Companies paid US\$43.0bn within the host countries: US\$26.2bn on local sourcing, US\$8.7bn in salaries, US\$7.6bn in taxes and royalties and US\$0.4bn in community spending.

- A total of US\$6.2bn remain as a 'residual' for the gold mining companies.¹⁵ The assumption here is that all the residual leaves the host countries. This is conservative as we know some of it accrues to host countries through state-owned equity stakes in individual mines and some may remain in country and be used for the construction of new mines.

The US\$16.3bn in wages and taxes in **Chart 8** constitute the direct value added of WGC members. The indirect value added from the entire supply chain was quantified by routing the US\$26.2bn of local procurement through the previously mentioned Input-Output models for each of the 38 countries. The resulting indirect value added was estimated at US\$21.6bn.¹⁶ This means that the indirect value added of gold mining is 1.3 times larger than (or 130% of) the US\$16.3bn direct value added.

Chart 8: Breakdown of revenues and costs of WGC members over 2020



14 Using a capital-to-output ratio of 2, which is representative of the mining industry, this implies a weighted average cost of capital of US\$5.6bn / (2 x US\$60.1bn) = 4.7%, which is nearly identical to the 4.8% cost of capital estimation of the Stern school at NYU (https://people.stern.nyu.edu/adamodar/New_Home_Page/datafile/wacc.htm). The cost of capital for individual companies depends on a number of factors, including the financial structure of a company, tax rates, credit rating and exposure to emerging markets.

15 As explained in **Annex 1**, the WGC member data was gathered at the country level. Although the 'residual' encompasses profits, it does not necessarily coincide with company-level profit data.

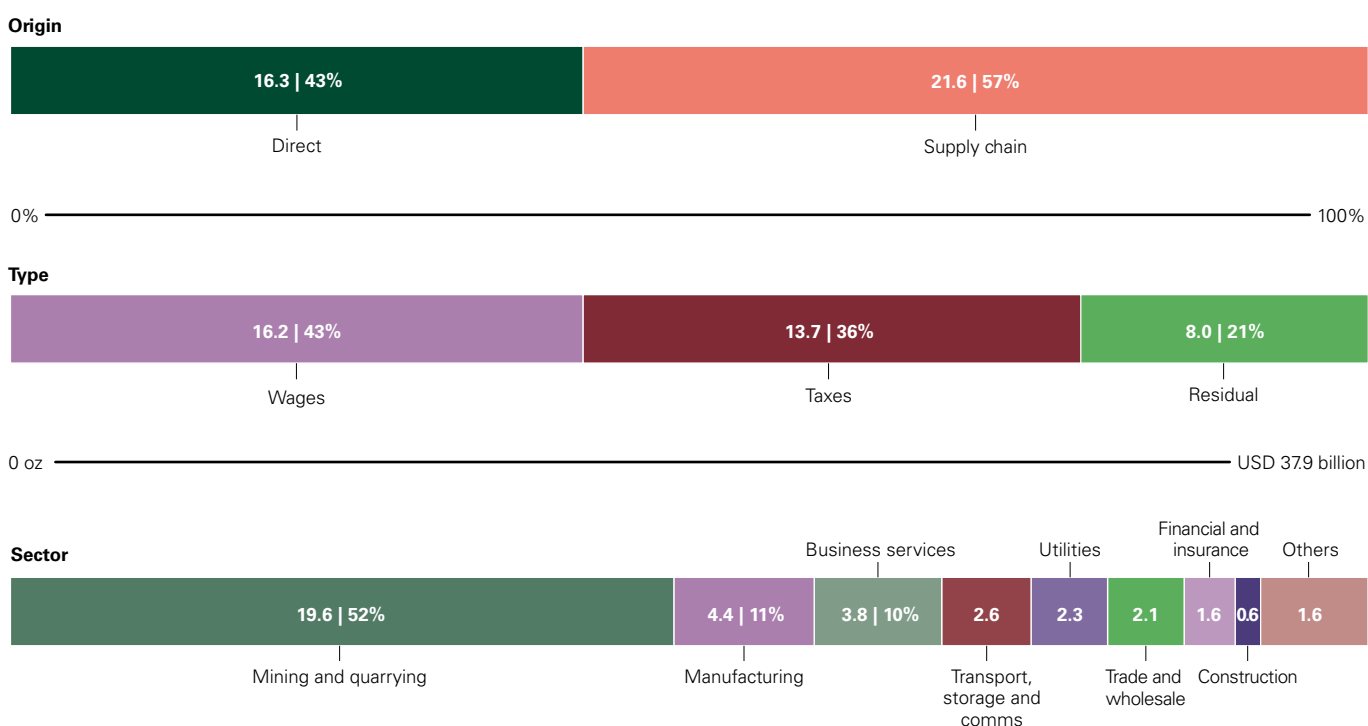
16 The US\$4.6bn difference between local sourcing and indirect value added is equal to the imports that were made by all companies in the supply chain.

The direct and indirect value added comes to US\$37.9bn, which is the total GDP contribution of the supply chains of WGC members.¹⁷ **This means that for every dollar of gold production, at least 63 cents ends up as salaries, taxes or incomes for business owners in host countries.**¹⁸

The total value added supported by the gold mining supply chain can be broken down in different ways, as shown in **Chart 9** which shows (from top to bottom) that:

- Over half (57%) of the value added in the host countries is indirect, and thus comes from the supply chain rather than directly from gold mining.
- Wages and taxes paid by WGC members and their suppliers are the two largest components, responsible for respectively 43% and 36% of value added.
- Roughly half (52%) of all value added is supported by the mining sector, followed by manufacturing (11%) and business services (10%).

Chart 9: Total value added (USD 37.9 billion) broken down by origin, type, and sector



17 Or 0.045% of the US\$84.5 trillion world GDP in 2020. Because the scope of this report comprises 39% of LSMs, the contribution of the entire large-scale gold mining sector is estimated at 0.12%.

18 US\$37.9bn of value added divided by US\$60.1bn of gold production. This estimate does not include the value added coming from investment in new mining operations.

Gold mining as a proportion of total GDP

Chart 10 shows that the relative importance of the output of WGC member companies to the GDP of host countries varies enormously. In the largest gold producing countries (e.g. Australia, Canada, China and USA), WGC members are responsible for just a small fraction of total GDP. While in these countries gold production may not be of crucial importance at the national level, it's impact can still be significant in specific areas or less developed regions within those countries. A good example of this is Canada's North, where the impact of gold mining is a major part of the regional economy. Mining is the largest private sector employer of Indigenous Peoples in Canada and a significant partner to Indigenous-run businesses.¹⁹ Another example is in northern Nevada, USA, where gold mining represents a major component of the regional economy.

Conversely, the national economies of countries like Suriname, Mali and Burkina Faso rely greatly on gold mining. WGC members support more than 3% of GDP in 5 of the 38 countries analysed. Suriname is a good example of this: WGC member companies and their supply chains contribute US\$620mn of in-country value added, equivalent to 16.3% of the country's GDP. In Mali and Burkina Faso, the GDP contribution of WGC members is 7.7% and 6.2% respectively.

For more details, **Chart 24** in **Annex 5** has different breakdowns of the GDP contribution of WGC members.

Growing government income

GDP is an important, albeit somewhat abstract, indicator of a country's economic development. However, for many countries, government income (often taxes and royalties) is a more tangible indicator.

In 2020, an estimated US\$13.7bn in taxes and royalties were paid by WGC members and their supply chains.²⁰

Chart 11 shows the tax payments per country, both in absolute terms and as a proportion of total government revenues. Not surprisingly, the largest tax payments are made in the countries with the largest production. In relative terms, WGC member companies and their supply chains contributed over 5% of total government income in 8 countries. In Suriname, this is as high as 42%.

Overall, 56% (US\$7.6bn) of the taxes are paid directly by WGC member companies, primarily through income and corporate taxes and mining royalties, with the remaining 44% generated by the supply chain.²¹

WGC member companies and their supply chains contribute US\$3.9bn of tax revenue in low and lower-middle income countries. In fact, in these countries a larger fraction of the GDP contribution comes in the form of taxes. This is important because these countries tend to have few alternative ways to fund themselves, given the small size of the private sector, their limited personal tax base and/or difficulty in accessing international financial markets. See **Chart 25** in **Annex 5** for more detailed breakdowns of the taxes generated by WGC member companies.

¹⁹ <https://mining.ca/our-focus/indigenous-affairs/>

²⁰ This constitutes 0.055% of the US\$25,187bn of government revenues worldwide. However, the actual share is higher as corporate taxes paid in the countries where gold companies have their headquarters have not been included. Given that this report encompasses 39% of LSM, we estimate that the gold mining supply chain contributes 0.15-0.20% of all government income worldwide.

²¹ Because the indirect effects are estimated using national I-O models, no breakdown of the different types of tax payments are available for the supply chain.

Chart 10: Total value added and relative GDP contribution by country²²

Direct and Supply chain VA (billion USD)

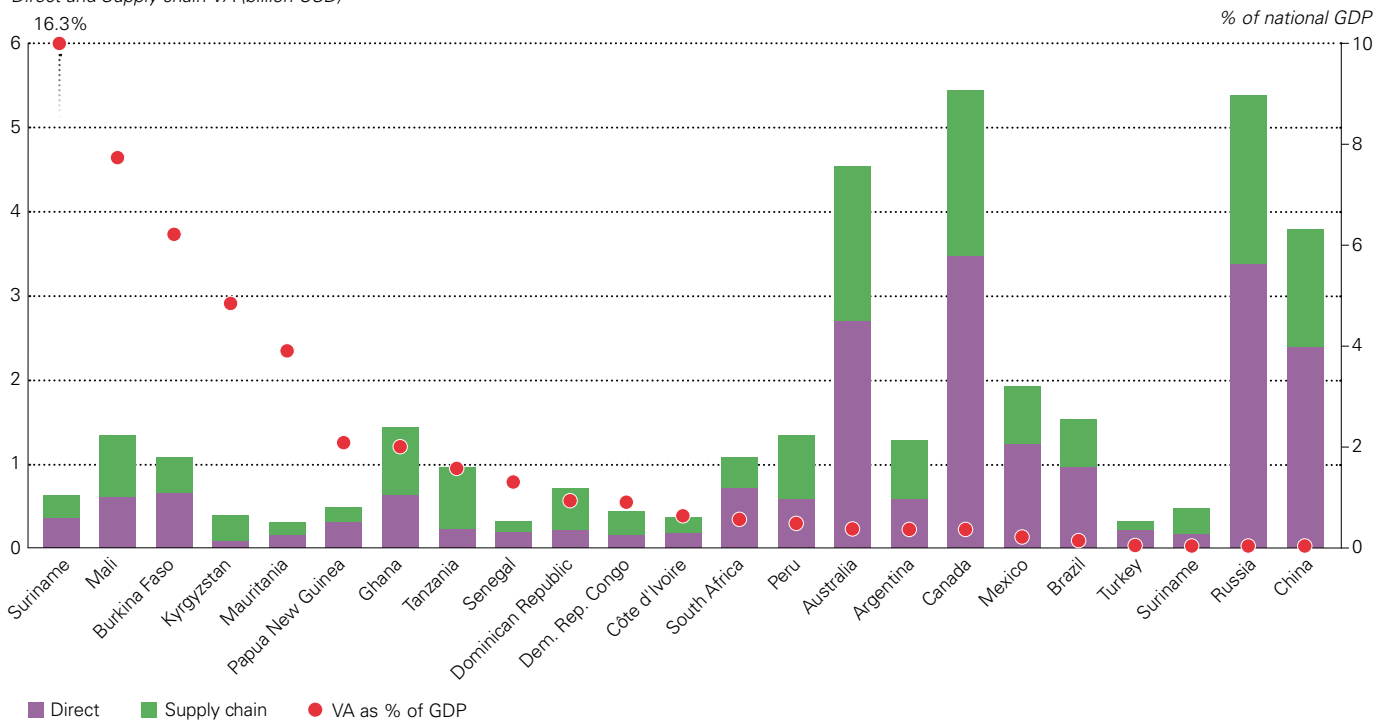
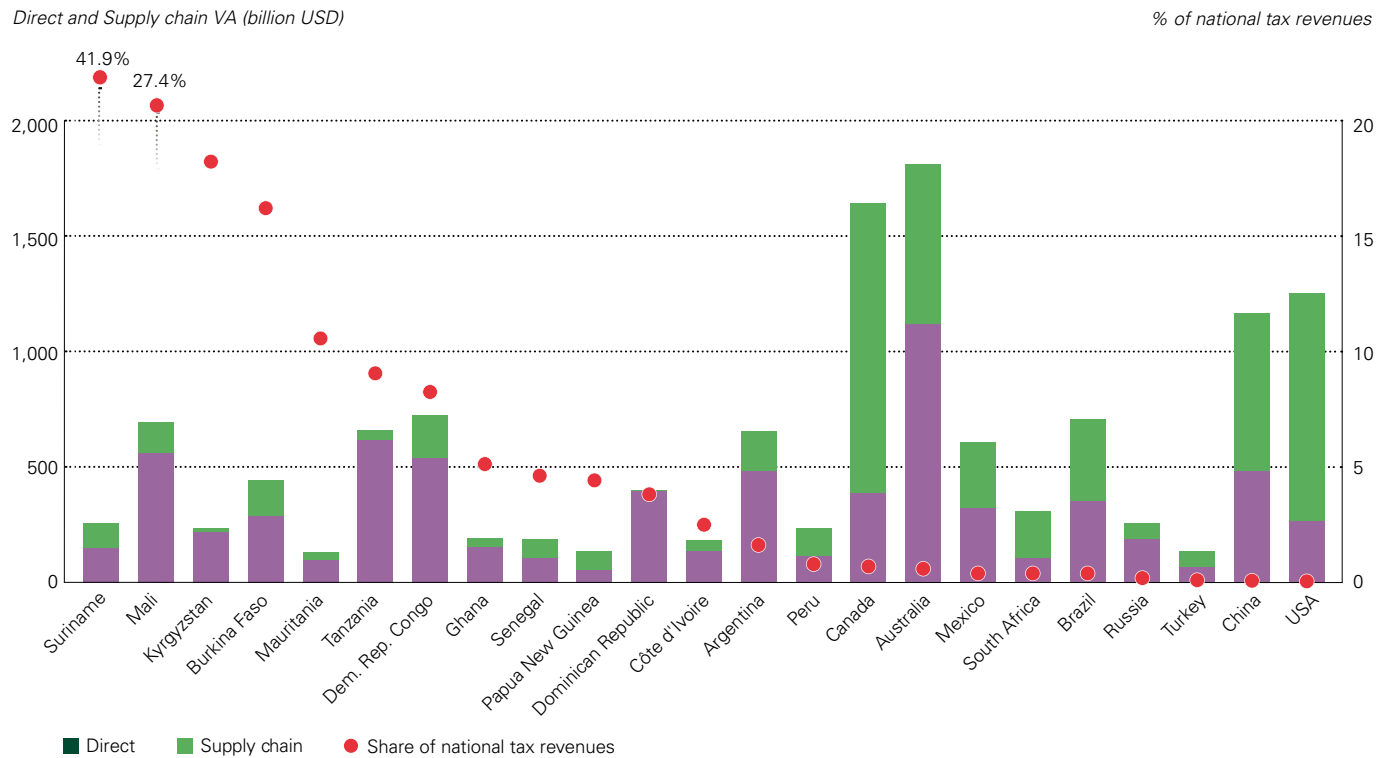


Chart 11: Taxes supported by the WGC members, and their contribution to national tax revenues (in %)²³

Direct and Supply chain VA (billion USD)



22 Only those countries with more than 1% of total production of WGC members are shown.

23 Only those countries with more than 1% of total production of WGC members are shown.

Supporting economic transformation

The lifespan of an individual mine is finite, although rarely less than 10 years.²⁴ The presence of an undeveloped gold mine therefore provides an opportunity to transform a natural resource into a source of social and economic development, both at the local level, which can raise the standard of living for the communities nearby, and the national level, for example through employment. Gold mining can help host countries transform their economies in three different but interrelated ways:

- Increasing the productivity of existing sectors and supporting the transition towards higher productivity sectors;
- Catalysing private and public investment;
- Improving the governance of resource revenues.

Increasing productivity of existing sectors and supporting the transition towards higher productivity sectors.

A simplified description of development is that low and middle-income countries transform economically by shifting the workforce from agriculture into the manufacturing and services sectors.²⁵ Gold mining companies rely extensively on local suppliers in both manufacturing and service sectors.

Of the total US\$31.5bn procurement of goods and services of WGC member companies, US\$26.2bn (83%) is sourced locally in the host countries, of which 50% in manufacturing, business and transportation services.²⁶ Cost and quality requirements imposed by mining companies tend to improve the productivity of local firms. At the same time, there is an opportunity for new products and services to substitute for imports due to lower transport costs and tariffs. Many WGC members support this process by providing expertise and know-how to help accelerate the replacement of imports with local goods and services.

Case study: Ghana Mining Hub

The Ghana Chamber of Mines (GCM) has declared its intention to position Ghana as the hub of mining support services and is taking concrete steps to realise this ambition. West Africa is one of the world's fastest growing mining venture destinations and Ghana is well-positioned to be a key player in this as support services hub for the region.

The GCM is currently in the process of putting together a team to identify where Ghana has competitive advantages with regards to providing mining support services. They will then develop a plan of action to ensure Ghana is the regional hub for these services.

The GCM has spearheaded efforts to increase local manufacturing capacity and today Ghana's local manufacturing industry has more capacity to produce mining inputs in-country than any other nation on the continent except South Africa.

Crucially, making Ghana a support services hub for the West African mining industry will accelerate the process of mainstreaming the mining industry and bring many benefits to the country's wider economy. The GCM 2020 report states that it is their expectation that the final outcome will be one that can become a blueprint to support the government's agenda for national development (*Ghana Chamber of Mines Annual Report, 2020*).

²⁴ The life cycle of a mine is depicted in [Chart 6](#).

²⁵ Traditionally, this was seen as moving the labour force from agriculture towards labour-intensive manufacturing, where skills-building then allowed for a further transition towards services. Recent thinking is more unsure about the specific pathways, but still emphasises the importance of technological progress, which can be achieved in manufacturing as well as in services.

²⁶ Typical costs such as fuel- and power-related costs are often associated with imported procurement, and hence not reflected in the local procurement category.

Catalysing private and public investment

Capital is another key ingredient of economic development that gives governments the opportunity to invest in their countries. But almost without exception, lower-income countries do not generate enough income to invest sufficiently in infrastructure, such as roads or power networks, or areas like healthcare and education. Many of these countries rely on Overseas Development Assistance (ODA), which may come with conditions, or borrow from capital markets, often on unfavourable terms. Our research shows that in several countries, the economic contribution of gold mining is comparable to that of ODA (see **Chart 12**, which compares the GDP contributions of the gold mining supply chain with ODA).

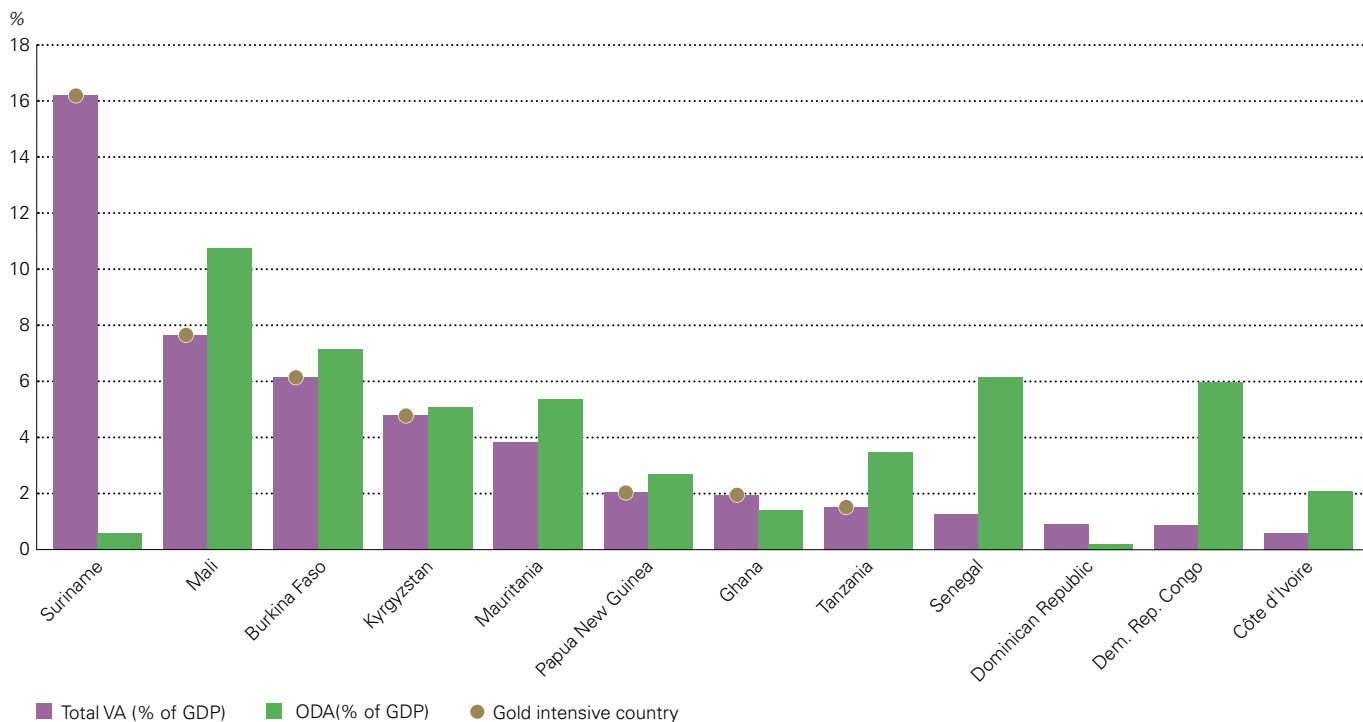
The extent to which countries translate their gold endowments into productive investments is not easy to analyse. But when comparing the combined public and private investment levels in gold-intensive countries with the other countries in this sample, it looks as if they do at least to some extent. While recognising that the number

of countries is relatively small, the average investment level over the past five years in gold-intensive countries is 29.4% of GDP.²⁷ This is 2.9 percentage points higher than mining-intensive countries and 5.3 percentage points higher than non-mining intensive countries. All being equal, higher investment typically translates into higher economic growth. While we cannot directly attribute this higher investment to the gold mining sector, it does run counter to the under-investment argument that is often made as part of the 'natural resource curse' theory, which states that resource-intensive countries invest less.

Improving the governance of natural resources revenues

For the above-mentioned tax revenues and investments to benefit national economies and their citizens, good governance of resources and revenues is required. Research has shown that most mining-intensive countries are closing the socio-economic performance gap with countries that do not rely on natural resources as a main source of income. However, the countries with better resource governance can make larger improvements.²⁸

Chart 12: GDP contribution of the WGC members and their gold mining supply chains compared to the contribution of Overseas Development Assistance



27 Investment is measured using the World Bank development indicator gross capital formation.

28 ICMM - Social Progress in Mining-Dependent Countries: Analysing the role of resource governance in delivering the UN Sustainable Development Goals (www.icmm.com/en-gb/research/social-performance/social-progress-2-2021).

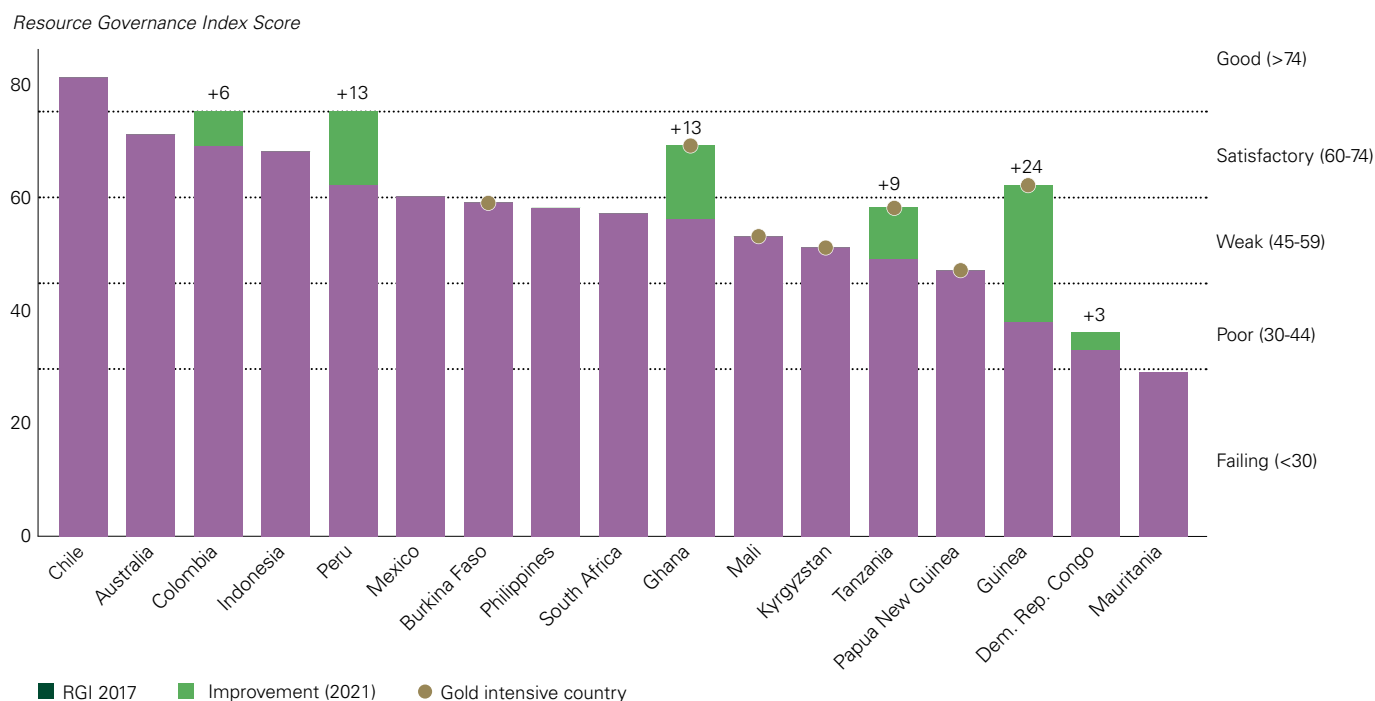
The Extractive Industries Transparency Initiative (EITI) implements the global standard to promote the open and accountable management of oil, gas and mineral resources. Of the 38 countries in the scope of this report, 27 have signed up to the EITI, either as implementing or supporting countries. This covers 78% of the total production by WGC members. If we exclude supporting countries that provide financial support for EITI but do not necessarily implement the EITI standard that number drops to 41% of total production. A number of supporting countries, however, have their own domestic revenue transparency regulations, such as the Extractive Sector Transparency Measures Act in Canada.

The quality of governance is improving in several countries as is shown in **Chart 13** where the 2017 Resource Governance Index (RGI)²⁹ scores are shown, together with the 2021 scores for the six countries for which they were available. For all these countries, the scores improved.

The most significant increase was achieved by Guinea which went from poor to satisfactory, although the score predates the impact of any changes associated with the political turmoil starting in September 2021. Ghana and Tanzania, two other gold-intensive countries, improved substantially. One must nevertheless bear in mind that the reality behind those aggregate scores is often nuanced and that improvements in one area can mask weaknesses in other ones.

Notwithstanding that, the improvements in governance are encouraging because they increase the likelihood that the 'window of opportunity' provided by the presence of gold mining translates into tangible and positive economic development and transformation in host countries.

Chart 13: Recent improvements in Resource Governance Index score



Source, NRG³⁰

²⁹ The Resource Governance Index is compiled by the Natural Resources Governance Institute is an independent policy institute in natural resource and revenue management. This chart only considers the RGI mining scores and not the RGI oil and gas scores. While the mining scores do not necessarily reflect gold mining, in Burkina Faso, Ghana, Kyrgyzstan, Mali and Tanzania the NRG³⁰ explicitly indicates that the gold sector is included. In Guinea and Papua New Guinea the focus is on bauxite and copper respectively.

³⁰ Countries without an RGI score for mining activities in 2017 are excluded. Senegal was scored for the first time in 2021 with a 75/100 score putting it in the "Good Governance" category (see case study below). In Mexico the 2021 score decreased very slightly from 60 to 59. Both these countries are not included in the graph

Case study: resource governance in Senegal

In 2021, the quality of resource governance in the mining sector of Senegal was independently assessed for the first time by the Natural Resource Governance Institute (NRGI) using their Resource Governance Index (RGI). The country score for Senegal was 75/100, placing it in the highest performance band. This score is determined by results from standards and practices in respect of the three components of the RGI: value realisation (where the sector in Senegal scored 70/100), revenue management (80/100) and enabling environment (75/100).

Senegal has significant geological potential, especially in gold, and three WGC member companies have a presence in the country. The Senegalese government has recognised this potential and opted to make the most of these resources to support development. To this end, they have been increasingly improving strategic, legal, institutional and fiscal frameworks in an effort to promote and support the mining industry. The achievement of this top score illustrates the country's strong mining sector governance and is indicative of the trend in many developing regions towards improved resource governance, leading in turn to better development outcomes.



Driefontein Environmental and Social Projects. Image courtesy of Sibanye-Stillwater.

Supporting Livelihoods

In this section, we discuss how the WGC member companies support livelihoods around four key themes: i) Employing people; ii) Increasing household incomes; iii) Fostering gender diversity and iv) Developing skills. The main conclusions are:

1. **For each of the 195,000 employees directly employed by WGC member companies, another 5.9 people work as on-site contractors or in the supply chains.** The total direct and indirect employment amounts to almost 1.4 million, while the re-spending of salaries supports another 692,000 induced jobs, bringing the total to more than 2 million jobs.
2. **Average wage levels of WGC member company employees are more than six times higher than people employed in their supply chain,** where salaries are more in line with the national average.
3. **National employees make up 95% of the workforce of WGC member companies.**
4. **An estimated 17.3% of the workforce of WGC member companies are women,** which is clearly unacceptably low, even if higher than the 5-10% average of the overall mining sector.³¹ Female representation at Board (24.6%) and Executive (17.6%) levels are also higher than the mining industry's overall average, but again not where they should be.
5. **WGC member companies spend on average US\$403 per employee on training per annum** in order to develop the workforce in terms of skills, productivity and safety performance.



Hiring a local workforce. Image courtesy of Agnico-Eagle Mines.

31 Penny Bamber, Vivian Couto, and Karina Fernandez-Stark, "Industry 4.0 in developing countries: The mine of the future and the role of women," World Bank, January 28, 2019, worldbank.org.

Employing people

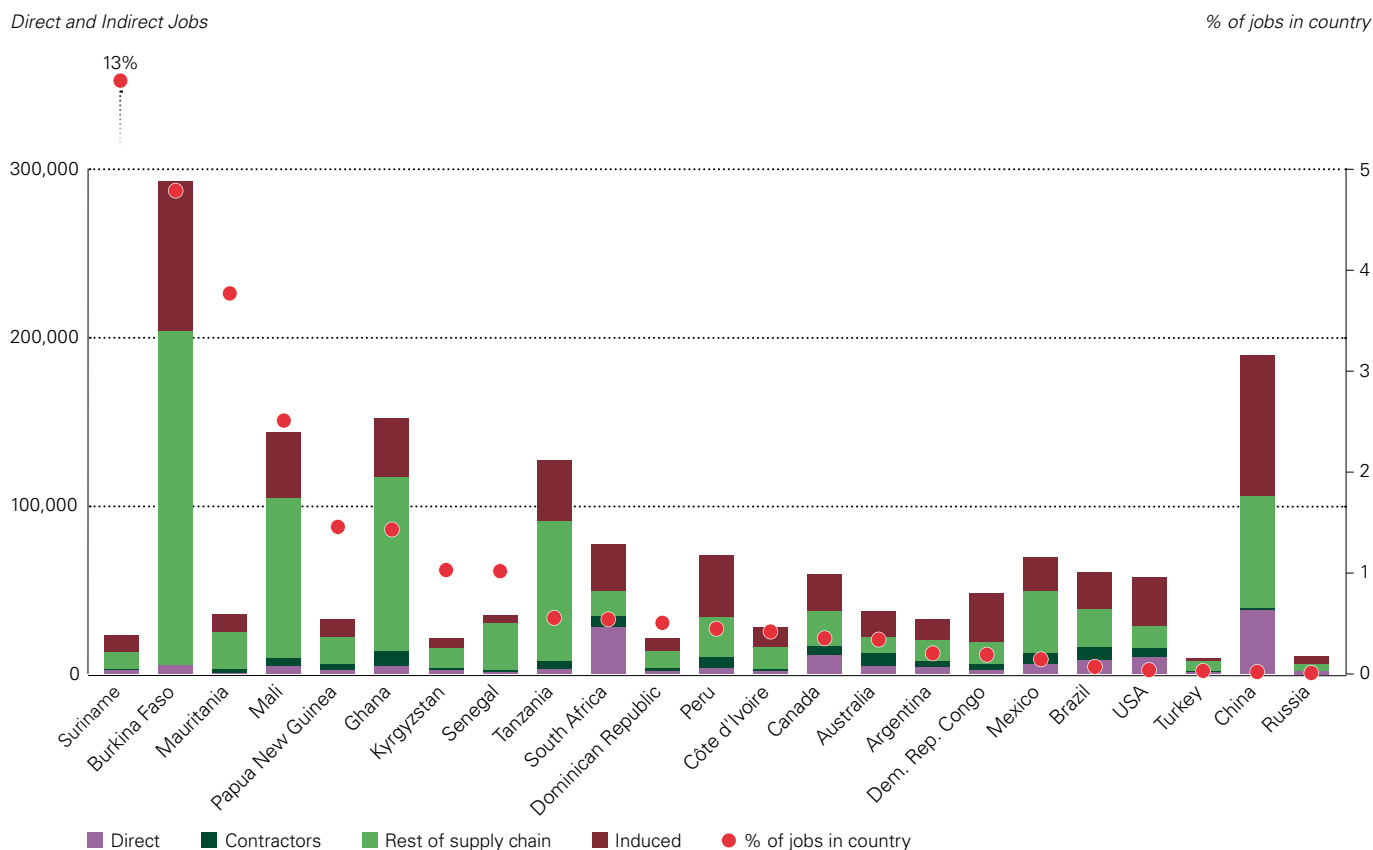
Just like the economic impact described in the previous chapter, the employment footprint of WGC member companies extends beyond the direct jobs they create, and includes contractors and jobs supported throughout the supply chain. In 2020, WGC member companies provided direct employment to 194,802 workers and 106,378 external contractors. Using the Input-Output model, we estimate that another 1,048,954 jobs were supported indirectly through 'local' procurement. This means that some 1,350,134 people are employed in the WGC members' gold mining supply chain, and that for every WGC member employee, another 5.9 indirect jobs are supported in the supply chain.³²

An important spill-over effect comes from the additional induced jobs created when the people employed in the gold supply chain re-spend their salaries in the local economy. Again using our I-O model, we estimate that an additional 691,794 jobs are created in this way.

Adding together all the supply chain and induced employment means that WGC member companies support 2,041,928 jobs globally,³³ which is almost as large as the workforce of the Republic of Ireland.

Chart 14 shows where these jobs are located geographically and what portion of the total in a country these jobs represent.

Chart 14: Total employment impact per country



³² $(106,378 + 1,048,954) / 194,802$

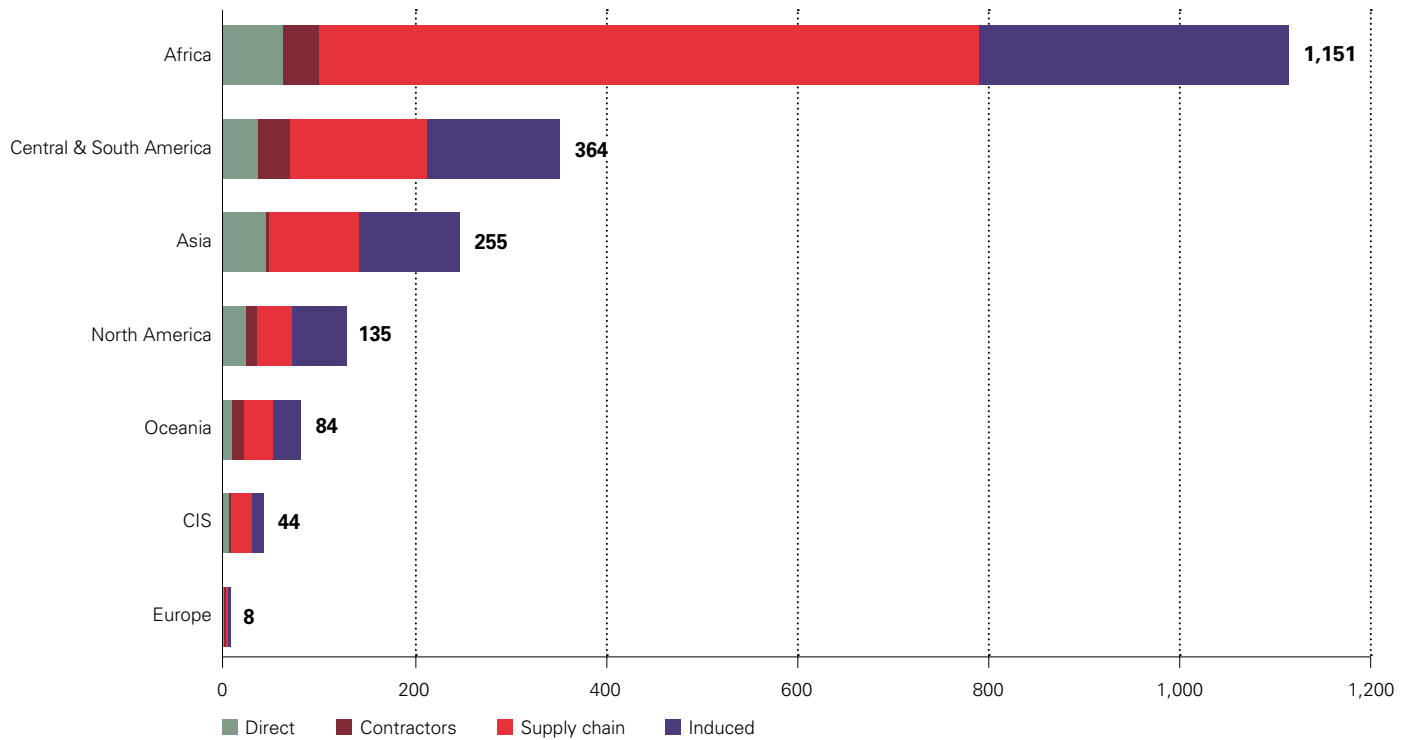
³³ This is 0.06% of the total labour force, which comprises 3.386 billion people according to ILO. Correcting for the 39% of gold production in the scope of this report, we estimate that the entire LSM supply chain provides employment for 0.15% of the world's workforce.

As **Chart 15** shows, more than half of all industrial gold mining supply chain-related employment is in Africa, where WGC members produce 26% of all gold (see **Chart 4**). In terms of employment multipliers, for every WGC member employee in Africa, there are nearly 17 jobs

supported elsewhere in the economy, either in the gold mining supply chain or through the re-spending of salaries. A more in-depth analysis of the average productivity of gold mining supply chain jobs in different countries can be found in **Chart 28** in **Annex 5**.

Chart 15: Total employment impact per region

Direct and indirect jobs (1,000 jobs)



Increasing household incomes

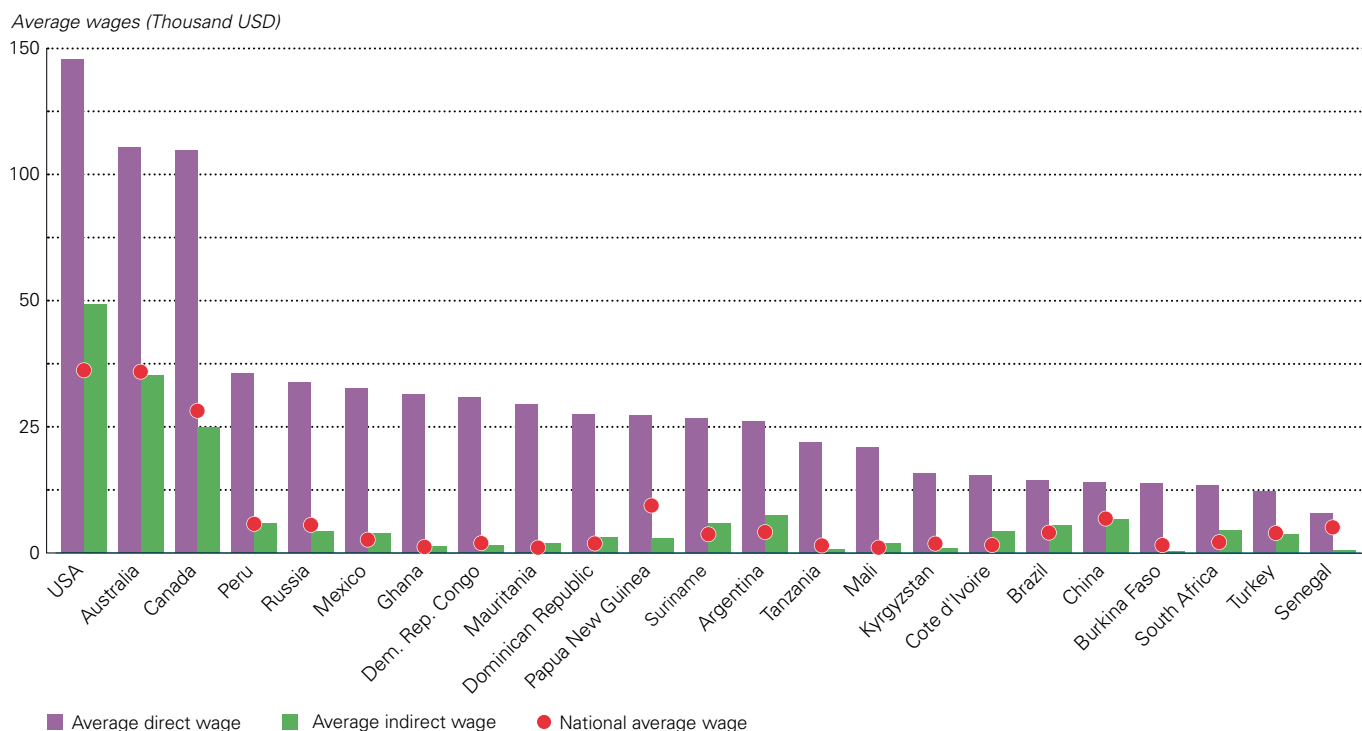
The previous section brought out the large productivity differences between countries and sectors. These reflect, for example, a variety of variables in the cost base, including labour costs and the extent of mechanisation/automation. **Chart 16** shows that employees at WGC member companies in higher-income countries are, not surprisingly, better paid than those in lower-income countries; but the difference is much smaller than one might expect. In all countries, WGC member company employees earn considerably more than the national average, ranging from slightly over twice as much in Australia to 28 times as much in Mauritania.

The earnings of employees in the gold mining supply chain often support many dependants, especially in less developed economies. This is especially true in remote areas, where alternative economic activities are scarce or less developed. Gold mining therefore plays a role in alleviating poverty by providing financial stability for the host communities in low-income regions.

That said, in certain circumstances the higher wages due to the presence of a mine can lead to price inflation for housing, food and essential services in the mine's vicinity, leaving workers and households who are not part of the supply chain with lower purchasing power.

Local recruitment and training programmes have been a critical part of the WGC member companies' drive to improve the percentage of nationals working at their operations. Many member companies have their own internal training and scholarship programmes and/or work with external educational organisations, such as universities, vocational schools and training institutions. Across WGC member companies' operations, 95% of employees are nationals and 5% expatriates.³⁴ Although expatriates probably constitute a larger percentage of the workforce in lower-income countries, and typically earn higher salaries, the bulk of direct wages paid are to local employees.

Chart 16: Average direct and indirect wages in the gold mining supply chain compared to the average national wage



34 Source: WGC member company data.

Striving for gender equality

The mining industry has historically been dominated by men, with women estimated to represent some 5-10% of the global mining workforce. Although the integration of women has been a challenge in the mining industry, over recent years gold mining companies have made significant improvements. In part, this reflects the growing societal interest in better diversity and inclusion practices, regulatory requirements and mounting investor expectations. The gold mining sector also acknowledges the need to remove barriers that prevent women benefiting from direct and indirect job opportunities and equal treatment when it comes to career advancement and training.

Companies increasingly recognise the business case for gender diversity in their mining operations. Research indicates that greater female representation at board level and in senior management roles can not only lead to improved business performance but also better risk-management.^{35/36} For example, one leading mining company found that more diverse teams outperform less diverse teams on safety management (measured by total recordable injury frequency rate), because they are more willing to speak up and follow safe working practices. They were also more likely to meet their production plans.³⁷ Crucially, diverse work and management teams are less likely to be susceptible to 'group think' when, for example, identifying and implementing risk management strategies.

The ambition to improve gender equality is illustrated in the Responsible Gold Mining Principles, which emphasise the importance of creating more inclusive working environments for women and in communities, ensuring equal access to opportunities supported by the gold mining activities. Principle 6.5 (Diversity) requires companies to promote diversity at all levels, including the representation and inclusion of historically underrepresented groups. Principle 6.6 (Women in Mining) requires companies to identify and remove barriers to women entering and remaining in the mining workforce, and to support women in the communities surrounding mining operations.

By combining WGC member companies data with ILO data on female employment in the mining sector per country, we estimate that women accounted for 17.3% of direct gold mining employees in 2020, which is better than the mining industry average of 5-10%, and an improvement on the estimated 10% for WGC member companies in 2013.³⁸ As illustrated in **Chart 17**, there is significant variation between countries, suggesting that legacy issues might still be taking a toll on women's access to employment opportunities in the gold mining sector. For example, Ghana and Colombia until relatively recently had laws in place that restricted female employment in mining.³⁹

Gender diversity in the gold mining sector is not only about the overall numbers but also seniority and equal opportunities for career development. The sector acknowledges the business imperative to promote and support women within their organisations and a positive momentum has been created.

35 www.wsj.com/articles/companies-with-diverse-executive-teams-posted-bigger-profit-margins-study-shows-1516322484

36 www.imf.org/external/pubs/ft/fandd/2019/03/pdf/fd0319.pdf, p.6

37 www.bhp.com/media-and-insights/prospects/2016/12/the-commercial-case-for-inclusion-and-diversity/; https://unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/Women_in_Mining_Webinar/Women_in_Mining_Presentation.pdf

38 WGC, Socio-Economic Impact of Mining Gold, p. 25 www.gold.org/goldhub/research/socio-economic-impact-mining-gold

39 <https://resourcegovernance.org/blog/women-mining-history-legal-invisibility-and-exclusion>

Case study: Supporting women in the workforce and in the community

WGC member companies are providing a more gender-sensitive and inclusive working environment inside their companies in order to attract and retain female talent at all levels. But many WGC members have also taken on gender-related issues that exist beyond the mine's gates.

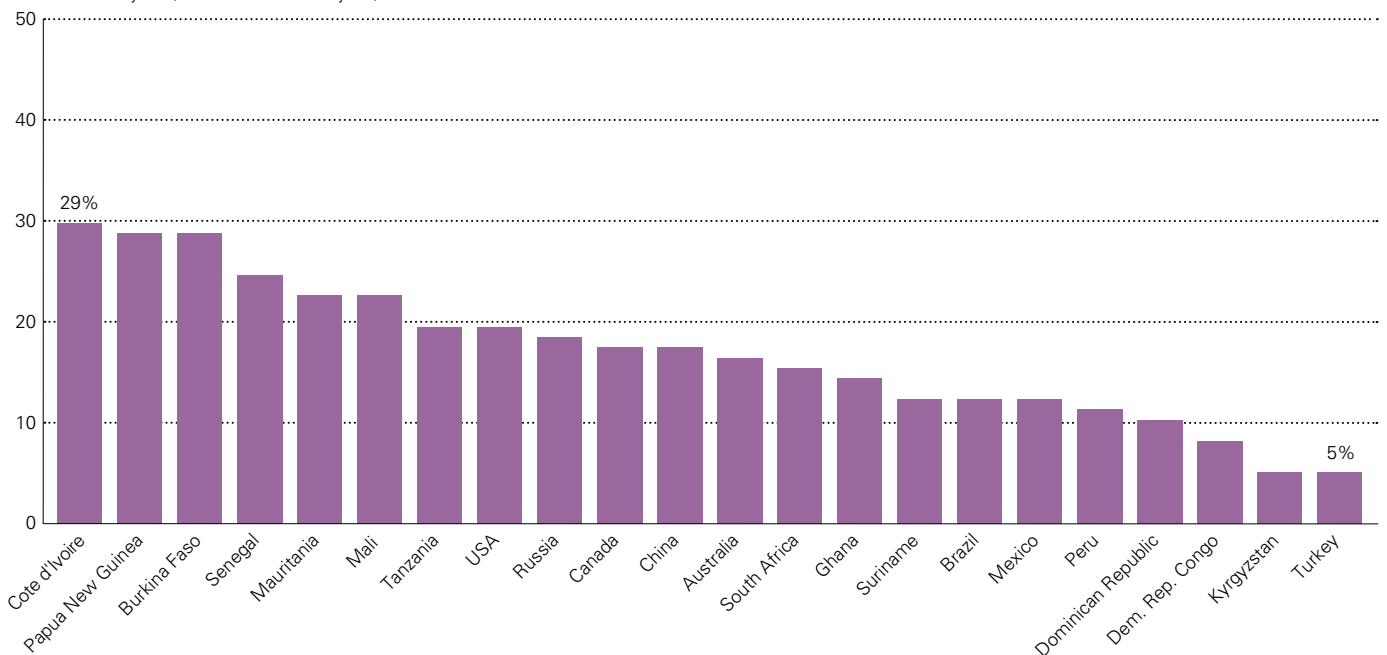
Endeavour runs women-in-mining programmes that help women succeed in jobs not traditionally seen as welcoming for women, such as mine truck driver roles. The company also chairs the HeForShe Mines Côte d'Ivoire Association, which was launched in December 2020 as a global initiative by UN Women and the UN Entity for Gender Equality and the Empowerment of Women. The Association was created to ensure the involvement of male allies in the struggle against gender inequality, to develop the principles of equity and to create favourable conditions for the advancement of women.

There are many other examples of how companies are helping women in communities. Kinross, for instance, supported the establishment of women's cooperatives, and provided direct and indirect employment for women at its Tasiast mine in Mauritania. In addition, it provided ongoing skills training and measures to advance the economic inclusion of women, including through small business training and the funding of micro-projects. So, for example, in 2020 the cooperative supplied thousands of face masks to the mine and local communities.

Many WGC members also set specific gender targets, which are often linked to executive pay, to improve diversity in their workforce. For instance, Golden Star, where women currently make up 7% of the workforce, has set a target of 20% women employees by 2025.

Chart 17: Estimated share of direct female employment supported by WGC members^{40/41}

Direct female jobs (as % of total direct jobs)

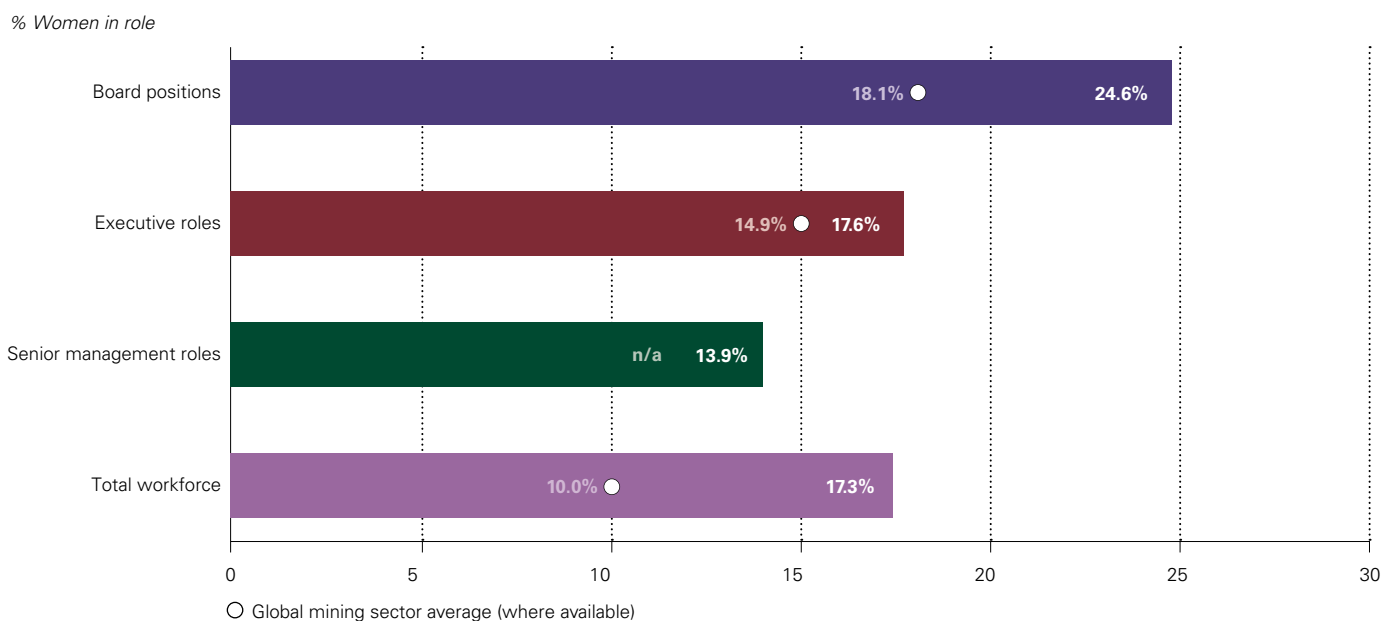


40 Based on the share of jobs for women in the mining sector, from ILO modelled estimates 2019.

41 Argentina, with a reported 60% representation of women in the mining sector (ILO), was removed due to anticipated data inconsistencies.

As illustrated in **Chart 18**, WGC members female representation in board and executive roles was 24.6% and 17.6% respectively in 2020. This is slightly higher than the mining industry average of 14.9% for the executive positions and 18.1% for board positions.⁴² The graph also shows that gold mining companies have the most progress to make in increasing the percentage of women who fill senior management roles.

Chart 18: Proportion of women in leadership positions, compared to global share of women in these roles in the broader mining sector⁴³



42 www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/despite-diversification-efforts-fewer-than-1-in-5-mining-leaders-are-women-59101897

43 Data on global mining sector average for senior management roles is not available.

Developing skills

Gold mining companies typically play an important role in developing the skills of their employees and contractors, from internships, on-the-job and vocational training to leadership programmes and engagement with local universities. They can also incentivise and support local suppliers to train their personnel to meet the required quality standards, resulting in overall quality improvement of services in the local economy.

In poorer regions of less developed and developed countries alike, where the number of skilled workers is low and significant skill gaps exist, gold mining companies can catalyse change by enabling people to expand their knowledge and develop new competencies. Many of the processes and technologies deployed at the mine sites are also used in other sectors. As such, management and technical skills and knowledge acquired during employment at a mine can be relevant for and transferable to other economic sectors. This in turn increases the ability of workers to find employment in similar capacities at other companies or sectors, should work at a mine no longer be available.

Skills development also helps career advancement and has a positive impact on employees' earnings. In 2020, the WGC member companies that provided data on training invested US\$60.9mn in skills development,⁴⁴ equivalent to a training budget of US\$403 for each of the 151,160 employees of those companies.⁴⁵ Extrapolated to the entire WGC workforce, the skills development investments would amount to roughly US\$78.5mn.

From the perspective of gold mining companies, investment in skills building in their workforces is vital for their long-term business success. First and foremost, it helps ensure that safety standards are followed and work is carried out efficiently. It is also increasingly seen as a strategy to mitigate risks of labour shortages. In some regions, the industry already faces difficulties finding the required skilled employees. This trend is likely to continue due to increasing automation, which is likely to lead to a smaller number of hard-to-fill skilled jobs replacing more abundant low-skilled ones.



An adult education programme to support the UN SDGs. Ity Mine, Cote D'Ivoire. Image courtesy of Endeavour Mining.

44 16 of the 31 WGC members provided data on employee training spent on training. These companies employ some 151,000 of the total 194,800 direct employees.

45 This figure was estimated based on the US\$60.9mn expenses and on direct job figures for the countries for which training expenses data was available (16 companies out of 31).

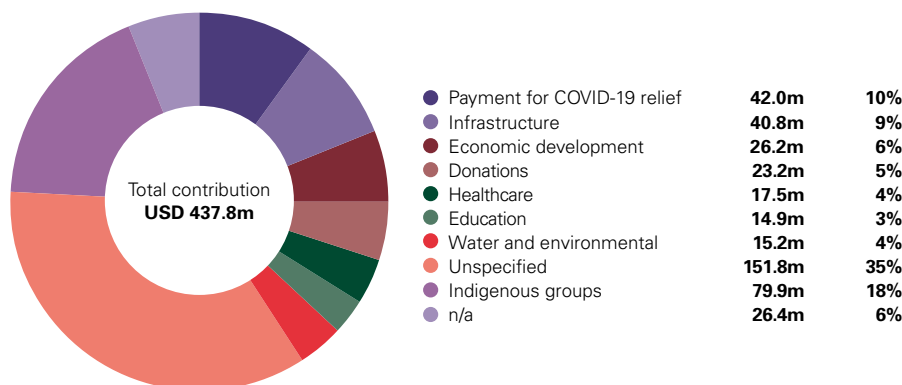
Investing in communities and contributing to the UN SDGs

Building strong relations with local communities

Most gold miners have a clear aspiration to leave the communities around their mines with a positive developmental legacy. Mining companies often become community partners, and provide infrastructure and support the delivery of public services. Listening to and acting on the concerns and expectations of local communities, engaging stakeholders regularly, and sharing benefits created by the mine are all key to establishing and maintaining a social license to operate. If the social and environmental costs of mining operations outweigh the benefits, it can cause social tensions or even conflicts between communities and mining companies. Lack of social acceptance of a mining project is therefore a significant business risk that can jeopardise the ability to realise value from an operation through delays and unplanned costs. Nurturing strong relationships with local communities is therefore an operational and business imperative for mining companies.

The requirements related to community relations are extensive in the **Responsible Gold Mining Principles (RGMPs)**. Specifically, umbrella Principle 7 – Working with Communities covers issues such as community consultation and engagement; provision of employment, training and procurement opportunities; rights of Indigenous Peoples; and the mitigation of adverse impacts on local communities. Across the entire mining sector, the approaches of gold companies to community relations management are among the strongest, according to The Community Wellbeing Index developed by the Responsible Mining Foundation.⁴⁶ Compared to other sectors, mining companies have developed considerable expertise in community engagement because, unlike most other industries, they do not have the option of relocating their operations if a good working relationship with host communities is not established and maintained.

Chart 19: Split of community spending per category in 2020 (USD)



⁴⁶ <https://2020.responsibleminingindex.org/en/results/thematic/318>

Investing in community development

Investments in community well-being, and improving public access to infrastructure and social services, as well as the promotion of healthcare and education, can catalyse regional growth and increase the prosperity of communities. In 2020, WGC member companies spent US\$438mn on payments to communities comprised of US\$359mn on community development projects and US\$79mn in payments to Indigenous groups. This is equivalent to some 5.8% of aggregate post-tax 'residual' of the member companies as per **Chart 8**.⁴⁷ While these number don't compare directly to companies in other industries that focus on philanthropic causes or CSR, one comparator we do note is the 1.8% CSR spending of aggregate after-tax profits of Fortune 500 companies in 2019.⁴⁸

Chart 19 provides an overview of the areas in which WGC members contributed financially to local community groups and Indigenous Peoples. Payments to Indigenous communities have been included here, even though they are often based on negotiated agreements and involve payments for developing resources on Indigenous lands. This type of financial transfer is often a part of a larger impact-benefit agreement that also stipulates other company obligations in areas such as environmental protection, community investment, and local hiring and buying. This amount represents the largest category of payment by WGC member companies and totals more than US\$79mn. A large portion of these payments are made to Indigenous communities in Canada and Australia.

Payments that support COVID-19 relief efforts were the second largest community spending area in 2020. Amidst the outbreak of the covid pandemic, gold mining companies have taken important steps to protect the health and well-being of their employees, contractors and local communities. Many companies with operations in developing economies have also provided humanitarian assistance to communities that were most in need. This included donations of funds and provision of medical equipment, supporting public healthcare institutions in their COVID-19 response, providing access to mine-site medical facilities, and even donating hospitals.⁴⁹ As per our 2020 data, WGC member companies spent over \$42m on Covid related community support measures, although we know from company pledges that the planned spend on Covid is much higher.

The gold mining industry also contributes to infrastructure improvements in areas surrounding their mines. Regardless of their size, gold mines require access to roads, water supplies, sanitation systems and electricity. Increasingly, these are constructed to also benefit local communities, rather than restricting use to mining companies. As shown in **Chart 19**, infrastructure projects were also among the largest community investments, with a total of US\$41mn in 2020. Access to healthcare and educational services can also positively benefit from mine development, especially in remote areas of low-income countries.⁵⁰ Some US\$32.5mn of the community spending of mining companies went to these services in 2020.

Case Study: Investing in the economic development of communities

Barrick Gold believes that creating jobs and contributing to alternative livelihoods is core to, and a fundamental responsibility of, any modern mining company. With that in mind, they strive to actively support local entrepreneurship in host communities and track the impacts of their investments as a way to measure their success as a business.

In Tanzania, Barrick supports a youth collective poultry business that is now thriving and selling hundreds of eggs each day to the mine and local communities. This provides vital additional income and jobs to young people, while contributing to the food security of the local community.

In 2020 in Nevada, USA, the I-80 Fund was launched by Barrick to provide low-interest loans to small businesses to help them keep afloat during the Covid-19 pandemic. Money repaid to the fund is reinvested in local community investment programmes to further the benefits.

Barrick also works with a local catering company in Argentina near the Veladero mine to promote and increase agricultural production, again improving food security and providing additional income to local farmers.

47 Net of US\$79mn spending on Indigenous Peoples, the remaining US\$359mn community spend is 5.8% of the estimated aggregate 6.2 billion after-tax profits USD (see **Chart 8**).

48 Berkeley Economic Review, 11 March 2020.

49 www.gold.org/about-gold/gold-supply/responsible-gold/blog/2020/05/gold-companies-support-governments-and

50 <https://pubs.iied.org/sites/default/files/pdfs/migrate/G00901.pdf>

The presence of a mine presents an opportunity for communities to invest and transform, with the aim of being better off when mining operations cease. The potential importance of these investments is greater in remote, impoverished areas that often lack capacity and resources from government institutions. For this community spending to have a lasting impact, close collaboration between the mining companies, host governments and community leaders is needed. There will always be tension between spending on the relief of immediate needs and the necessity for longer-term investment, but gold mining companies increasingly work side-by-side with local and regional governments when prioritising, planning and implementing socio-economic development initiatives. These partnerships will drive further progress.

Gold mining's contribution to the UN SDGs

People who have been involved in gold mining, or even visited a gold mine site, are often struck by how strong the links are to the local community and, particularly in developing countries, the extent to which a mine is able to contribute to social and economic development in the local and national economy. The industry is behind hundreds, if not thousands, of individual development projects – some small, some large – which altogether add up to a sizable contribution to the realization of the UN SDGs. Whether it is a project supporting internet connectivity in a small town, enhancing physical infrastructure such as roads or power supplies, helping protect and enhance potable water supplies, enhancing biodiversity to offset other environmental impacts or supporting local business expand their operations, the gold mining sector is

increasingly a proactive and visible partner in a country's development journey. Many of these contributions will have lasting impact on the host economies, even after mining ceases, especially where many of the skills can be deployed in other sectors.

Research prepared jointly by the UN Development Programme, the World Economic Forum, the Columbia Center on Sustainable Investments and the Sustainable Development Solutions Network outlines how mining contributes to the achievement of the SDGs.⁵¹ In 2020, the WGC published its own report *Gold Mining's Contribution to the UN Sustainable Development Goals*,⁵² which looked at the contribution of the industry across almost all the SDGs.

Annex 4 provides a detailed list of SDG targets and indicators covered in this report. Particularly noteworthy are the contributions that the industry makes to SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth) and SDG 17 (Partnerships for the Goals). Other examples, less well known but nonetheless important, include efforts to improve access to water and sanitation (SDG 6), enhance biodiversity (SD15) and importantly tackle climate change (SDG 13). The industry efforts to reduce GHG emissions, in support of SDG 13, is the subject of further discussion in the next chapter.

The next chapter also expands specifically on what the mining industry is doing to improve performance and operate responsibly, including how they are proactively mitigating the negative environmental and social impacts associated with gold mining which, if not addressed, could adversely affect progress on the SDGs.

51 www.undp.org/publications/mapping-mining-sdgs-atlas

52 www.gold.org/about-gold/gold-supply/responsible-gold/gold-minings-contributions-sdgs

Responsible Mining

Enhancing ESG Standards in the gold mining sector

Though this report looks at the positive social impacts of gold mining, it is important to acknowledge the adverse impacts as well. These may include environmental impacts on land and water resources, biodiversity loss and greenhouse gas emissions. Unmitigated negative impacts can disproportionately fall on vulnerable groups, women and Indigenous Peoples. Furthermore, economic risks such as the mismanagement of resource revenues, economic rent seeking and limited linkages with other sectors in the economy can arise if governments do not have effective natural resource governance and accountability structures in place. Whilst it is important to acknowledge these and past failures, the sector has made significant advances in recent years. Deliberate steps have been taken to manage the environmental, social and human rights impacts, improving the safety and inclusiveness of the work environment, increasing energy efficiency, and providing transparency on financial flows.

The release of the Responsible Gold Mining Principles (RGMPs) in 2019 was a milestone in formalising the industry’s commitment to integrate sustainability considerations into everyday operations. The framework was developed under the aegis of the WGC, with robust input from various stakeholders through an extensive consultation process, including civil society, investors, governments and businesses within the gold value chain. The 51 RGMPs cover the material environmental, social and governance (ESG) issues relevant to the gold mining industry, and set out clear expectations as to what constitutes responsible gold mining. The RGMPs recognise and include existing ESG standards and instruments, such as the UN Guiding Principles on Business and Human Rights, the Voluntary Principles on Security and Human Rights, the WGC Conflict-free Gold Standard, and the Extractive Industries Transparency Initiative (EITI). An overview of the 10 headline topic areas covered by the RGMPs is shown in **Chart 20**.

Chart 20: Overview of Responsible Gold Mining Principles



Source: World Gold Council

The RGMPs were launched in late 2019 with a three-year implementation timeline. At the time of launch, many WGC member companies already had strong ESG systems in place, although perhaps in a less structured manner. As such, the RGMPs helped create an organising framework to build on existing good practices, and incorporate new aspirations and stakeholder expectations. Full compliance with the RGMPs, including a requirement for independent assurance and public disclosure through a RGMP report, is mandatory for all WGC members. Implementation however is not restricted to WGC members and several non-members have also adopted this framework.

Due to the three-year implementation period, no aggregate insights and data are yet available for inclusion in this report.

As the global expectations around ESG continue to increase, driven by societal challenges such as climate change, inequality and the COVID-19 pandemic, sustained efforts are needed to bridge existing gaps and continually improve operational performance.

Mitigating greenhouse gas emissions

The economic impact of WGC members described in Section 4.1 comes together with greenhouse gas emissions. Whereas the occurrence of adverse effects, such as water contamination, depend on the (in)adequacy of processes and not on mining production volume, unless production technologies change, greenhouse gas emissions will continue to go up in line with the use of fossil fuel-based energy used to drive increasing production. Because of this intricate link between economic and climate impact, it is appropriate to analyse them side by side.

The WGC has released four reports on climate change in recent years: Gold and climate change: an introduction;⁵³ Gold and climate change: current and future impacts;⁵⁴ Gold and climate change: The energy transition;⁵⁵ and Gold and climate change: Decarbonising investment portfolios.⁵⁶ These reports show that, while the gold mining industry is inherently energy intensive, there are clear opportunities and concrete plans to reduce GHG emissions and align with the Paris agreement goals. In other words, there is a clear and realistic pathway for gold miners to reach net-zero by 2050.

The cumulative GHG emissions of WGC member companies can be estimated using the GHG intensities as determined for the entire gold mining sector in the WGC reports described above.⁵⁷ Although these average intensities mask the substantial differences between countries, they suffice for estimating the total GHG emissions in the scope of this report.

53 www.gold.org/goldhub/research/gold-and-climate-change-introduction

54 www.gold.org/goldhub/research/gold-and-climate-change-current-and-future-impacts

55 www.gold.org/goldhub/research/gold-and-climate-change-the-energy-transition

56 www.gold.org/goldhub/research/gold-and-climate-change-decarbonising-investment-portfolios

57 www.gold.org/goldhub/research/gold-and-climate-change-current-and-future-impacts

Table 1: Greenhouse gas emissions in tonne CO₂ equivalent of all WGC members' production

Scope	Tonne CO ₂ e per tonne gold	Tonne CO ₂ e per troy ounce gold	Tonne CO ₂ e emissions
Scope 1	13,197	0.41	14,153,352
Scope 2	15,931	0.50	17,085,478
Scope 3 (upstream) ⁵⁸	7,287	0.23	7,815,070
Total	36,415	1.13	39,053,900

Source: World Gold Council

Table 1 summarises the GHG intensities for Greenhouse Protocol Scope 1 (direct emissions), Scope 2 (purchased electricity) and Scope 3 (upstream supply chain).

For each ounce of gold produced, slightly more than one tonne of GHG is emitted. With the total production of WGC members in the scope of this report being 34.5 million ounces, the total greenhouse gas emissions are 39.0 million tonnes CO₂ equivalent. 36% of these emissions are in Scope 1, 44% in Scope 2 and 20% in Scope 3.

To put the GHG emissions into financial perspective, the UN Global Compact has called for businesses to adopt a price of US\$100 per tonne of CO₂e.⁵⁹ The average revenue per ounce of gold in 2020 was about US\$1,743. This implies that the monetised cost of GHG emissions is more than 6% of revenues.⁶⁰ This emphasises the importance of the decarbonisation of the gold mining supply chain from a company financial perspective.

From a broader socio-economic perspective, it is instructive to compare the emissions of the global gold mining supply chain to its global GDP contribution. This is an important ratio because it is captured as SDG indicator 9.4.1: CO₂ emissions per unit of GDP. The Scope 1, 2 and 3 (upstream) emissions in **Table 1** capture all GHG emissions of WGC member companies and their entire supply chains. The analysis of the GDP contribution of gold mining also covers the entire gold mining supply chain and the results derived can therefore be compared directly to GHG emissions stated here. The total GDP contribution of US\$37.9bn (see Section 4.1), in combination with the 39.0 million t CO₂e emissions, means that for each US dollar of GDP contribution, 1.03 kg CO₂e are emitted. It is difficult to directly compare this with other sectors or value chains because of the inherent differences in the activities. Nevertheless, as a reference, the 2018 greenhouse gas intensity of the entire world economy was 0.39 kg for each dollar of GDP.⁶¹

58 The Scope 3 downstream emissions of 375 tonne CO₂ per tonne gold are 5% of the upstream emissions, or 1% of the total emissions. Scope 3 emissions are the most difficult to quantify. The Scope 3 emissions stated here include an allowance for transmission and distribution of the electricity consumption included in Scope 2.

59 As per 4 October 2021, the price per tonne of CO₂ in the EU ETS is €63 (US\$73) and the UK ETS price is £74 (US\$99), although this is not a current cost for gold companies. The price for CO₂ in developing economies is likely to vary substantially from the EU ETS prices. For example, recent discussions around CO₂ prices in China and India have focused on a lower price level.

60 $1.13 \text{ tonne CO}_2\text{e per ounce} * \text{US}\$100 \text{ per tonne CO}_2\text{e} / \text{US}\$1,750 \text{ per ounce} = 6\%$.

61 The World Bank Development Indicators report a value of 0.41 kg of CO₂ per US\$1 of GDP measured in constant 2010 USD in 2018. The World GDP deflator for the 2010-2018 period is 1.04, hence $0.41 / 1.04 = 0.39 \text{ kg}$.

The WGC recently investigated the energy transition pathways of the gold producers and their supply chains. The main conclusion was that, based on current plans, emissions are estimated to fall by 35% in 2030, with the potential for an additional 9%. This improvement can be achieved through decarbonisation of the grid-power sources (Scope 2 in **Chart 21**) and by gold companies substituting fossil fuel-based power self-generation with cleaner grid power and renewable energy generation. Decreasing production from high-emission mines will also play a role. Realising the full 44% reduction would bring

the GHG emissions per unit of GDP to 0.58 kg per dollar. While still higher than the economy overall, it would align the industry with the Paris 1.5C° targets.

It is important to note that substantially all gold greenhouse gas emissions come from the mining stage. If one also includes the greenhouse gas emissions in downstream processing and value addition, for example in jewellery, this would make the overall greenhouse gas intensity through the entire value chain lower still.

Conclusion

Gold mining takes place all over the world, often in remote locations. If conducted responsibly, it can make a significant contribution to social and economic development, at both the local and national level. This requires gold mining companies to develop and invest in local employees and businesses, support host communities and work with governments and civil society to improve the governance of natural resources.

Our analysis helps address some of the most commonly held misperceptions about the industry, including that gold miners don't spend their money within their host countries. On the contrary, our data show that for each dollar of gold revenue, at least 63 cents remain in the host countries, where it accrues as income for employees, businesses and governments. Just as important, for each employee of a gold company there are almost six other jobs created elsewhere in the supply chain, and close to four more jobs in the broader economy. In total, WGC member companies supported over 2 million jobs globally in 2020.

However, average figures mask large differences between countries. In developed countries, the economic value of the gold mining supply chain comes from relatively few jobs, each one of which creates substantial value added. In contrast, in less developed countries, with lower labour productivity, the gold mining supply chain supports many jobs that create relatively less value added. Notably, the labour productivity of WGC member companies is high everywhere – both in developed and developing countries.

Invariably, gold mining jobs are well paid, often many times the national average. Companies also spend a considerable amount of time training their employees to ensure high standards of safety and efficient operations, and with most jobs being recruited within host countries (around 95% compared to 5% expatriates), these skills can often be transferred elsewhere in the economy, creating positive knock-on effects. Although the mining sector remains dominated by men, women are becoming better represented in the workforce, and at board and executive levels. Nevertheless, companies could do more to promote women through middle management and technical roles up into senior management.

Whilst the lifespan of a mine is finite and host countries and communities should regard the operation as a “window of opportunity” for development, many of the benefits accrued during the lifecycle of the mine remain afterwards. These can include infrastructure such as power and water supply, a skilled local workforce and a more active business community. Responsible mining companies now recognise that they have a duty to design operations for responsible closure and work with stakeholders to plan for minimising the social dislocation caused by eventual closure.

It is also encouraging to observe that the quality of resource and revenue management in several gold-intensive countries is improving. The following three factors combined - contribution to government income, catalysing investment and improving governance - bode well for countries hoping to transform their economies for the benefit of their populations, spurred by the presence of gold mining.

This report set out to quantify how gold mining creates and supports national and local economies, as well as livelihoods and employment. Many of the findings allow the quantification of the aggregate contribution of WGC member companies to the UN SDGs. A single year provides only a snapshot of gold mining's contribution so more work is required to measure this over a longer period. This would make it possible to better capture the contribution and overall impacts over the entire business cycle. Such an undertaking may require a further standardisation of the data collection process for WGC members. Similarly, the scope of the report could also be broadened to include other adverse impacts, where possible in a quantitative manner. The information that WGC member companies will report, in compliance with the Responsible Gold Mining Principles, may provide a good starting point for this.

Annex 1: Methods and Economic Model

Overview

This report quantifies the socio-economic contributions of the gold mining industry. Socio-economic impact can be measured with different metrics, but we mainly focus on two of the most important ones:

1 Value added (equivalent to GDP)

- Taxes
- Salaries
- Profits

2 Employment (jobs)

In host countries, mining companies pay taxes to governments (including collecting taxes relating to the earnings of their employees) and salaries and benefits to employees. They also support economic activity in the local supply chain through procurement from local businesses. The activities of these businesses again generate tax revenues, employment, salaries and profits for business owners, as well as further economic activity through procurement from other local businesses. In addition, everybody employed in the supply chain spends part of their salaries on goods and services such as food, housing, healthcare, etc. Hence, local procurement from mining companies has a far-reaching impact on national economies, creating value added and employment opportunities at different stages of the gold mining supply chain.

It is therefore convenient to distinguish impact across three stages:

- Direct impacts: effects directly related to expenditures of gold mining companies. This includes salary and benefits, tax payments and profits generated that remain in the local economy, as well as direct employment at the mine site.
- Indirect impacts: effects arising at suppliers of goods and services, as well as their respective suppliers, and so on, in terms of incomes and jobs generated.
- Induced impacts: the employment effects associated with the re-spending of salaries of people involved in the entire gold mining supply chain.

Model description

Input-Output (I-O) modelling is the method used to quantify the socio-economic impact of gold mining operations.⁶² The method combines financial data from WGC members with macro-economic and employment statistics. The I-O model allows us to trace the local procurement expenditures by WGC members throughout the national economies in which they operate. This allows quantification of value added and employment supported by WGC members and their local supply chains.

The key ingredient of the I-O modelling approach is the Social Accounting Matrix (SAM). The SAM is a blueprint of the national economy and quantifies financial flows between economic sectors.⁶³ It is a statistical and static representation of the economic and social structure of the local economy.⁶⁴ As shown in **Chart 21**, in the SAM the number of columns and rows are equal because all sectors or economic actors (industry sectors, households, state and the foreign sector) are both buyers and sellers. Columns represent buyers (expenditures) and rows represent sellers (receipts). Of the four quadrants in the SAM, three are relevant here. Final consumption induces production, which leads to financial transfers between the various sectors, which subsequently generate incomes for households, state (taxes) and profits (dividends and savings).

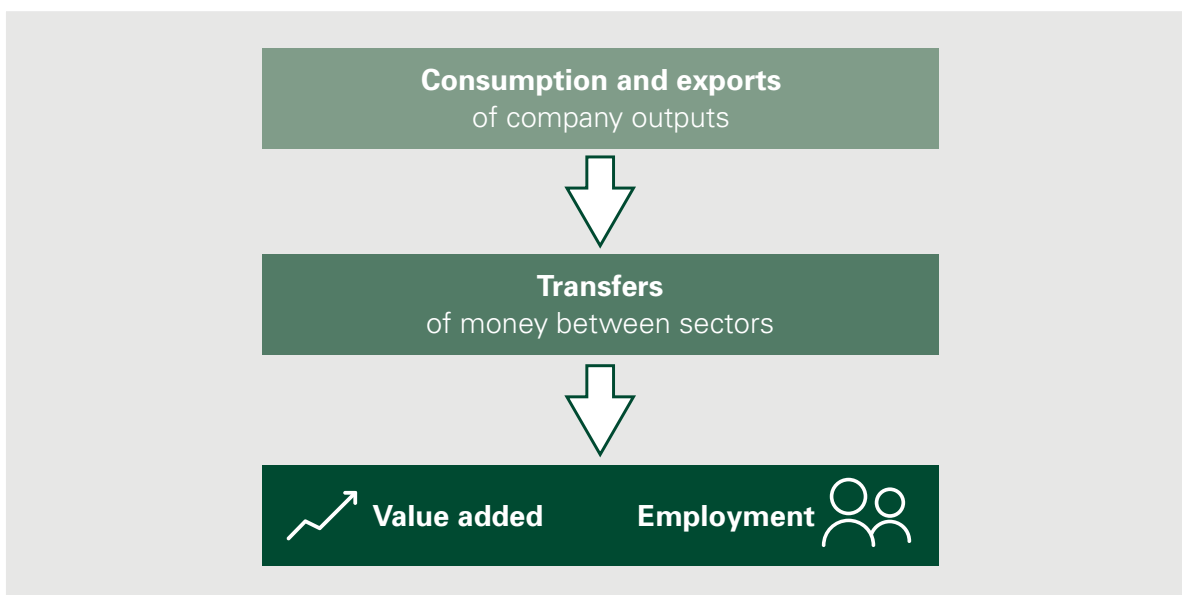
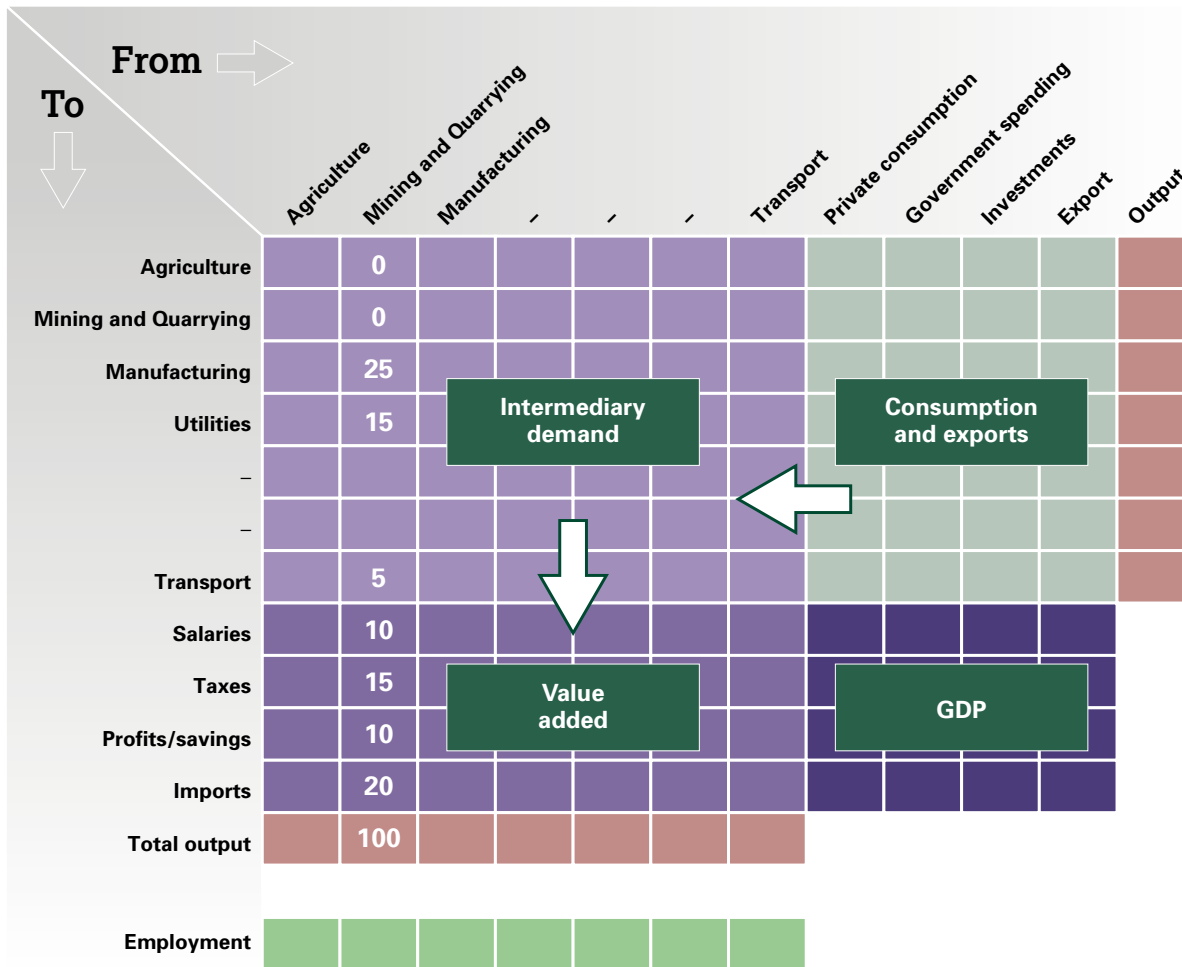
Driven by gold exports (in the mining row), the total expenditure of WGC members to other sectors in the country can be derived from the corresponding column. In each 'round' of spending, value added (salaries, taxes and profits) are generated and money leaks out of the economy to imports.

62 Developed by Wassily Leontief, for which he received the 1973 Nobel Prize for Economics.

63 For each country, a specific SAM is available. In a few cases, a country-specific SAM was not available. In such cases, we used the available SAM from the smallest aggregate region (e.g. for the Dem. Rep. Congo, the SAM for South Central Africa was used). SAMs are available from the GTAP (Global Trade Analysis Project; <http://www.gtap.agecon.purdue.edu>) database.

64 SAMs are valid for a specific year. Economies are subject to change and SAMs must be updated periodically.

Chart 21: Social Accounting Matrix



Economic data and assumptions

The scope of the analysis in the current report is 2020. Besides the 2020 financial data from WGC members, the main data sources are the Global Trade and Analysis Project (GTAP), the World Bank Group (WBG) and the International Labor Organization (ILO). **Chart 22** lists all relevant data sources. The current report uses the most recent data available.⁶⁵

Output vs value added

Output and value added are frequently-used indicators to quantify the size of economies, but are intrinsically different. Output is the value of an industry's production: the sum of an industry's value added plus intermediate inputs. Value added is a subset of output and is a useful measure of incomes created: the salaries, taxes and profits earned due to economic activities.

Consider a gold mining company that procures goods and services from its suppliers, and uses those goods and services to produce gold which has a greater value (output) than the sum of the goods and services bought (intermediate inputs). That increase in value is the value that the gold mining company adds. This added value is then used to pay salaries and taxes and ideally some profit remains.

In this report, we quantify the value added of the WGC's member companies and their supply chains. This differs from the often-reported Direct Economic Value Generated and Distributed as per GRI Standards disclosure 201-1, which is an output approach (see text box GRI reporting on financial flows). The advantage of the value added approach is that it looks at the actual incomes received by workers, governments and business owners.

GRI reporting of financial flows

Many gold mining companies report according to the GRI standard. The GRI disclosure on Direct Economic Value Generated and Distributed (201-1) distinguishes: revenues, operating costs, employee wages and benefits, payments to providers of capital, payments to government, and community investments. All these items are shown in **Chart 8**, in which the operating costs are divided between import and local (i.e. within country) sourcing. In the chart, wages and taxes constitute the direct value generated (conservatively assuming that the surplus accrues to foreign shareholders). Payments to suppliers is an output measure and not a value added measure.

In the economic modelling approach taken in this report, we trace how local spending flows through the economy and translates into indirect value for workers, governments and businesses, or leaves the economy as imports made by companies in the supply chain of the gold mine. In this way, one can see who the ultimate beneficiaries are of the local procurement of gold mines, how much they benefit and in which sectors they are located.

For reasons of comparison with the output approach, the table below summarises the aggregate in country spending of WGC member companies.

In-country Spending category	Amount (USD million)	%
Local sourcing	26,203	61%
Wages	8,716	20%
Taxes	7,634	18%
Community spending	438	1%
Total	42,990	100%

⁶⁵ All SAMs come from 2014, updated with macro-economic statistics. This is the most recent data available. The structure of an economy changes very little over short time periods, which is why results are still valid using SAMs from recent years.

This report differentiates between value added created and supported. The WGC members directly create value by paying salaries to their own employees, paying taxes and earning a profit. However, the indirect value added that is generated by procuring goods and services from local suppliers is supported. It is an important distinction, as some of the value added that is generated in the gold mining supply chain might have occurred anyway, even without the presence of the mining.

Assumptions

The main assumption in the model described above is that input-output analysis implicitly assumes that an increase in demand can be met by an increase of production at constant prices in all affected sectors of the economy. However, there are sectors that will not 'feel' the effect of an increased demand, and therefore will not experience an increase of production. Alternatively, there can also be sectors that are unable to increase production at constant prices because of shortages of, for example, labour, raw materials or production capacity. This assumption is especially relevant when the economic impact of newly-built mines is analysed. Another important assumption is that money flows of suppliers are equal to the averages of the sectors they are in.

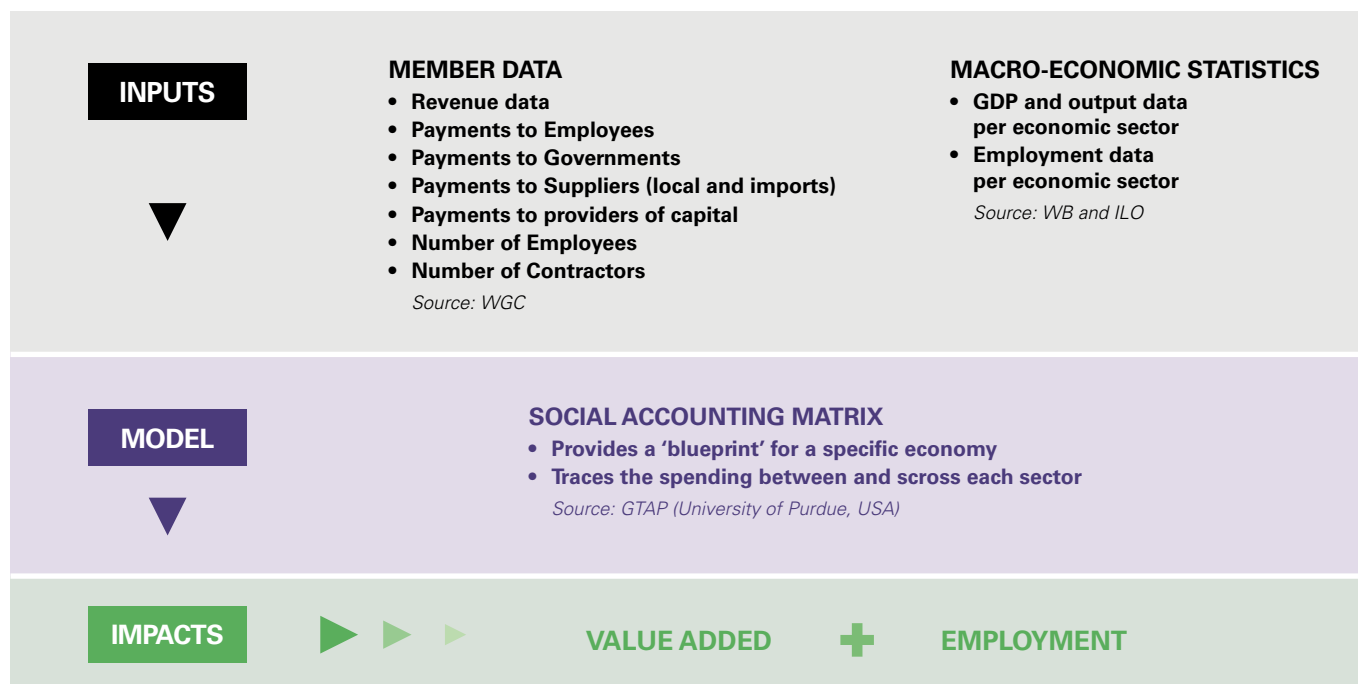
Procurement estimation per sector

The model uses average expenditure patterns from the relevant GTAP mining sector to trace economic transactions throughout the economy because no detailed breakdown of expenses by economic sector was available.

Employment estimates

2020 direct employment figures were provided by WGC member companies. The indirect employment is estimated using an employment intensity (i.e. employment per unit output). We retrieved employment data per sector from ILO, and economic output data from GTAP and the WBDI database.

Chart 22: The methodology combines member data with macro-economic statistics to estimate the impact results



Annex 2: Data Collection and Analysis

Data collection

The data collection process took place between 30 June and 14 September 2021. Information on 31 WGC members was collected, with insights on 41 countries, of which 38 are gold-producing countries and the focus of this report. A template was shared and two sets of data collected:

- 1 core data and
- 2 supplementary data.

The two tables below represent these data sets.

Table 2: Core data from WGC members

Data Points	Disaggregated by
Gold output (ounces)	Producing operations
Revenue from Gold Sales (USD m)	
Total Mineral Revenue (USD m)	
Number of Employees	Producing and Non-producing operations
Number of Contractors	
Payments to Employees (in-country employees)	In-country and Out-of-country expenditures, Producing and Non-producing operations
Payments to Suppliers	
Payments to Governments: Royalties and land-use payments	
Payments to Governments: Income and other corporate tax	
Payments to Governments: Employment taxes	
Payments to Governments: Other	
Payments to Communities and Community Investments	
Payments to Providers of Capital	

Table 3: Supplementary data requested from WGC members

Data Points	Disaggregated by
Role	
Executive leadership	Male/Female
Seior management	
Middle/junior management/technical	
Operators/administrators	
Total employees	
Total contactors	
Board of Directors	
Employment	
Total employees	National/Expatriate
Total contactors	
Community Spendings	
Health	Per Country
Education	
Water and environmental	
Economic development	
Infrastructure	
Donations and other partnership	
Payments for COVID-19 relief	
Payments to indigenous groups	
Other	
Training Details	
Average hours of training per employee on 2020 (GRI 404-1)	Overall
Total expenditure on training in 2020	
Number of employees trained	
Number of community members trained	

Data processing

Once the data collection process was completed, final adjustments were made to process the data.

Some member companies were not able to complete the supplementary data tables. For example, they did not have a breakdown of their employee roles in the format requested or did not have data on training. In most cases, only the data provided by members was used. The exception was for training expenditure, where we estimated training expense per employee by extrapolating from the 16 member companies that submitted this data and applying it across the entire workforce of the WGC members.

Where there were inconsistencies between the payments to communities in the core data and total community spend in the supplementary data, in most cases we used the supplementary data (which was usually lower) unless there was a logical reason to use the core data total. These adjustments were not material to the overall numbers.

Annex 3: Defining Gold-Intensive Countries

In this Annex we identify the extent to which countries depend on the presence of gold mining and mining in general. This is relevant because a great resource dependency can raise concerns around the so-called 'natural resource curse'. This natural resource curse essentially states that a large resource sector can stifle the economic development of a country because it reduces the competitiveness of other sectors, and thereby economic diversification, and increases volatility.

Resource-richness or endowment refers to the natural availability of mineral, forest, coal, oil and natural gas reserves in a country. While there are large differences in the availability of such natural resources across countries, it is more relevant to the analysis in this report to distinguish countries based on the extent to which revenues from resources are important relative to the country's whole economy. To make such a distinction, the report follows the methodology from ICMM that identifies resource-dependent and mining-dependent countries.^{66/67} The result of this analysis is depicted in **Chart 4** and in **Chart 23** below.⁶⁸

To capture the economic importance of natural resources, the report looks at the generation of incomes from natural resources in the entire economy, and the value of exports of these resources relative to all exports from a country. Hence, a country is resource-intensive when:

- Total natural resource rents are at least 10% of total GDP or;
- The value of coal, metals and mineral exports is at least 20% of the country's total exports value.⁶⁹

Resource rents represent the revenues from natural resources minus the cost to extract or harvest them. Total natural resource rents are the sum of oil, natural gas,

coal, mineral and forest rents multiplied by the respective physical quantities. These are then reported as a share of GDP. The data was derived from the World Bank.⁷⁰ The share of coal, metals and mineral exports in total exports is available from ICMM. Using these rules, 20 out of the 38 countries in the report classify as resource-intensive.

Within the set of resource-intensive countries, a country is considered mining-intensive when: At least 33% of the value of total exports are from coal and minerals.⁷¹

Of the 20 resource-intensive countries, only 3 are not mining-intensive: Senegal, Russia and Colombia. Because of this, and because the report focusses on mining operations, resource-intensive and non-resource intensive countries are included under one category: non-mining-intensive.

The methodology used by ICMM does not distinguish gold-intensive countries from mining-intensive countries. Hence the approach used looks at the value of national raw gold exports as a share of the total value of exports from a country.⁷² The data used for this analysis comes from UN Comtrade. A threshold of 20% of the total export value of a country was used to distinguish gold-intensive from mining-intensive countries. Resulting in a set of nine gold-intensive countries. The countries are listed per category in **Table 4**.

Chart 23 illustrates the relative importance of mining and gold mining in these nine countries in terms of the contribution to exports and government revenues. In all nine gold-intensive countries⁷³ gold exports make up more than 20% of total exports. In countries such as China, Russia, USA and Canada, the bubbles appear small because their large gold exports are quite modest relative to the size of their economies and export volumes.

66 See www.icmm.com/en-gb/research/social-performance/social-progress-2-2021

67 The approach in this report deviates slightly from the methodology used by ICMM due to data availability constraints. We therefore also use a different definition that refers to resource-dependent countries as resource-intensive.

68 Averages between 2014 and 2018 are used because this eliminates the risk of distortions due to annual fluctuations, and because it spans the period since the last socio-economic impact report up until the most recent year with comparable data available.

69 The original definition used says that the value of exported natural resources is at least 20% of the total exports value in a country. However, the definition used by ICMM was not clear enough to replicate natural resource exports value, and the shares were not readily available for the countries in the scope of this report. Coal and mineral exports are therefore used as proxy.

70 <https://databank.worldbank.org/metadataglossary/adjusted-net-savings/series/NY.GDP.TOTL.RT.ZS>

71 The original definition says that at least 75% of the value of natural resource exports are metals and minerals. Due to the absence of this data, we used coal and mineral exports as a proxy. Since this data represents the share of coal and mineral exports in total exports, and not natural resource exports, we take a threshold of 33% to distinguish mining-intensive from resource-intensive countries. While this is not the same, it captures the same thinking.

72 In UN Comtrade data distinguishes many products based on the 6-digit Harmonized System. We use code 7108.12 to identify raw gold exports, which excludes, for example, semi-manufactured and monetary gold. Also see www.globalwitness.org/en/campaigns/natural-resource-governance/how-gold-trade-data-could-be-better-used-for-due-diligence/

73 Burkina Faso, Ghana, Guinea, Guyana, Kyrgyzstan, Mali, Papua New Guinea, Suriname and Tanzania.

Chart 23: Gold, mining and non-mining intensive countries

Average export contribution of minerals and coal (2014-2018, % of total exports)

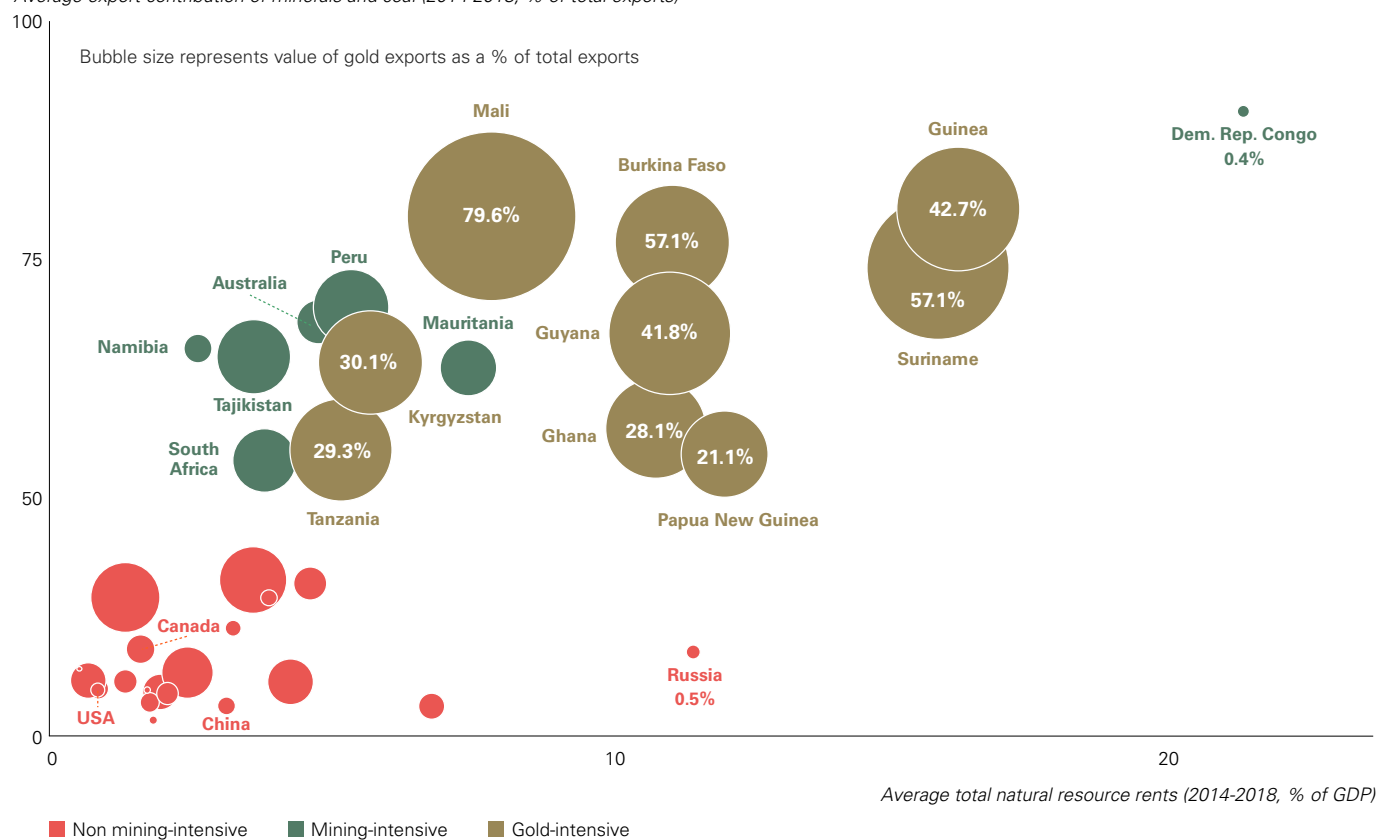


Table 4: 39 countries in the scope of the report by category



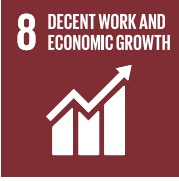
Non-mining-intensive		Mining-intensive	Gold-intensive
Argentina	Indonesia	Australia	Burkina Faso
Brazil	Mexico	Chile	Ghana
Canada	New Zealand	Dem. Republic of Congo	Guinea
China	Nicaragua	Mauritania	Guyana
Columbia	Philippines	Namibia	Kyrgyzstan
Côte D'Ivoire	Russia	Peru	Mali
Dominican Republic	Senegal	South Africa	Papua New Guinea
Ecuador	Serbia	Tajikistan	Suriname
Finland	Turkey		Tanzania
Greece	USA		
Honduras			





Annex 4: Summary of Results by UN Sustainable Development Goal (SDGs)

Summary table of quantitative findings for relevant SDG indicators

The gold mining supply chain has many connections with the Sustainable Development Goals. By virtue of the detailed country-level data provided by WGC member companies and the country-specific economic and

employment modelling, several specific SDG indicators can be quantified with a high level of confidence. The overall results are presented in the table below. We note that substantially all the indicators can be quantified for each of the countries included in this report.

Sustainable Development Goal	Relevant indicators	Contribution of WGC members and their supply chains
	1.a.2 Proportion of total government spending on essential services (education, health and social protection)	US\$13.7bn of taxes were paid by WGC members and their supply chains. Although this doesn't speak to how governments spend the tax revenue, it is safe to assume that in most cases these payments enable them to spend a higher proportion on essential public services. This is a way people from non-mining regions of the country can also benefit from mining.
	5.1.1 Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex	Although not a legal framework, the RGMPs emphasise the importance of creating a more inclusive working environment, including through equal opportunities for women. Progressive practices which promote gender equality at one company can often spill over to other parts of the economy through employees, suppliers and other partners, and by changing norms and expectations.
	5.5.2 Proportion of women in managerial positions	Across all WGC members, female representation on boards is 24.6%, in executive roles 17.6% and in senior management roles 13.9%. The total workforce employed by WGC members is 17.3% women. These figures are all higher than total mining averages (although no data is available for global mining averages for senior management positions). Compared with 2013, the percentage of women in the WGC labour force has increased from 10% to 17.3%, though there are still large differences across countries.
	8.2.1 Annual growth rate of real GDP per employed person	The gold mining industry supports roughly 1.35 million jobs and US\$37.9bn value added directly and throughout the supply chain (excluding induced jobs). For each country, the average value added contribution per job exceeds that of the average GDP per employed person, with a factor ranging from 1.3 (USA) to 11.7 (Democratic Rep. of Congo). Most of this contribution can be attributed to the highly-productive mining activities of WGC members.
	8.3.1 Proportion of informal employment in total employment, by sector and sex	Across WGC members' entire supply chain, including their own operations, 53% of the total workforce was employed formally. This amounts to 709,278 jobs, including 106,378 contractors.
	8.5.1 Average hourly earnings of employees, by sex, age, occupation and persons with disabilities	Jobs directly generated by WGC members have higher yearly earnings than the average yearly salary in all countries. As shown in Chart 16 , annual salary earnings are between 2 (Australia) and 28 (Mauritania) times higher than the national average. However, jobs supported in the supply chain seem to lag behind those created directly by WGC members, reflecting the lower productivity of economies in which gold mining takes place and possibly, in smaller companies, a lower level of organised unionisation for collective bargaining.

Sustainable Development Goal	Relevant indicators	Contribution of WGC members and their supply chains
	9.2.1 Manufacturing value added as a proportion of GDP and per capita	For all WGC members combined, more than a third of gold revenues is used to procure goods and services locally, providing opportunities for capacity building and skills development in the local economy. Throughout local supply chains, WGC members support manufacturing value added amounting to roughly US\$4.4bn, or 11.5% of total value added supported by WGC members.
	9.2.2 Manufacturing employment as a proportion of total employment	The manufacturing employment as a percentage of all jobs in the WGC members gold mining supply chain is 17.8%.
	9.4.1 CO ₂ emission per unit of value added	The economic activity supported through supply chains is also related to the emission of greenhouse gases. For each USD of value added supported, businesses in the local gold mining supply chain emit 0.94 kg. This is more than twice as much as the 2018 average world value of 0.39 kg per unit of value added.
	10.4.1 Labour share of GDP	US\$16.2bn, or 42.6% of the total US\$37.9bn value added contribution by WGC members, are represented by wages and benefits.
	16.6 Develop effective, accountable and transparent institutions at all levels	78% of total production volumes from WGC members comes from countries that are EITI implementing countries, either as supporting or implementing.
	17.1.1 Total government revenue as a proportion of GDP, by source	Of the US\$37.9bn in value added supported, US\$13.7bn, or 36.2% accrues to governments as tax contributions, both directly and throughout the supply chain.
	17.3.1 Foreign direct investment, official development assistance and South-South cooperation as a proportion of gross national income	Total FDI as percentage of GDP for gold-intensive countries is larger than for non gold-intensive countries. No gold sector-specific FDI data per country was available.
	17.11.1 Developing countries' and least developed countries' share of global exports	Total gold export value of low- and lower-middle income countries amounts to US\$15.0bn, 25% of total WGC member gold production.

Annex 5: Supplemental breakdown of data

Chart 24: Value added supported per region, income classification and type of dependency (USD billion)

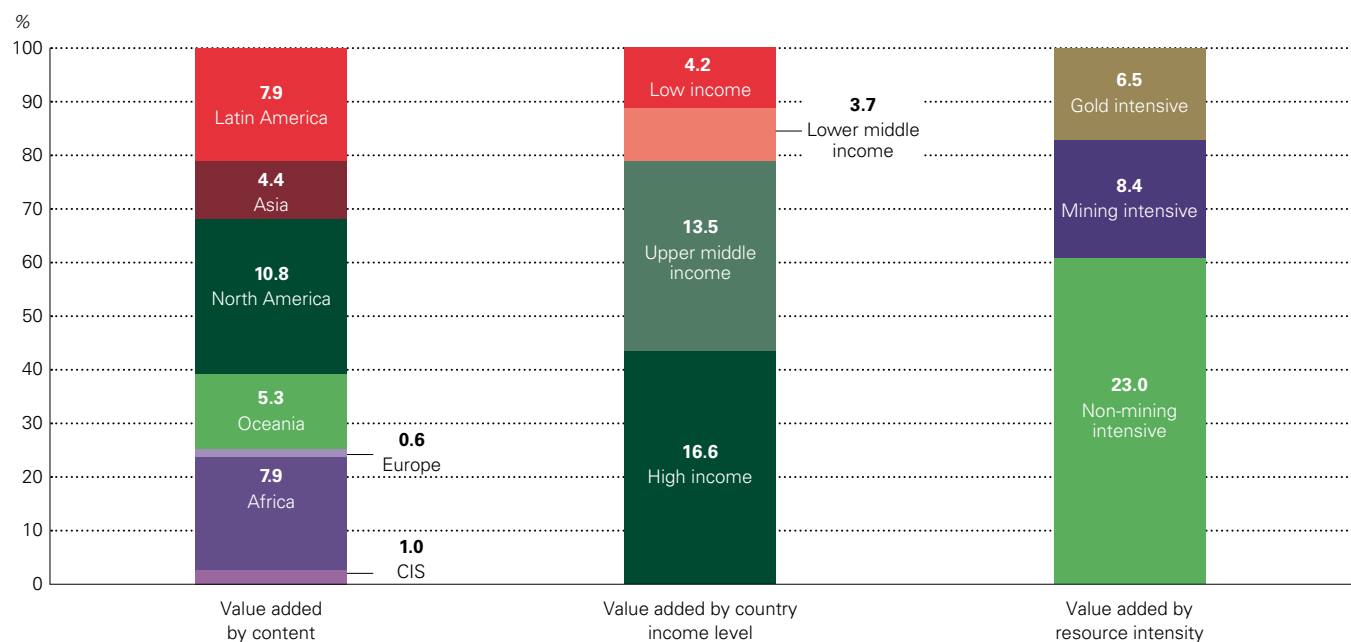


Chart 25: Taxes supported per type, country income level and resource intensity (USD billion)

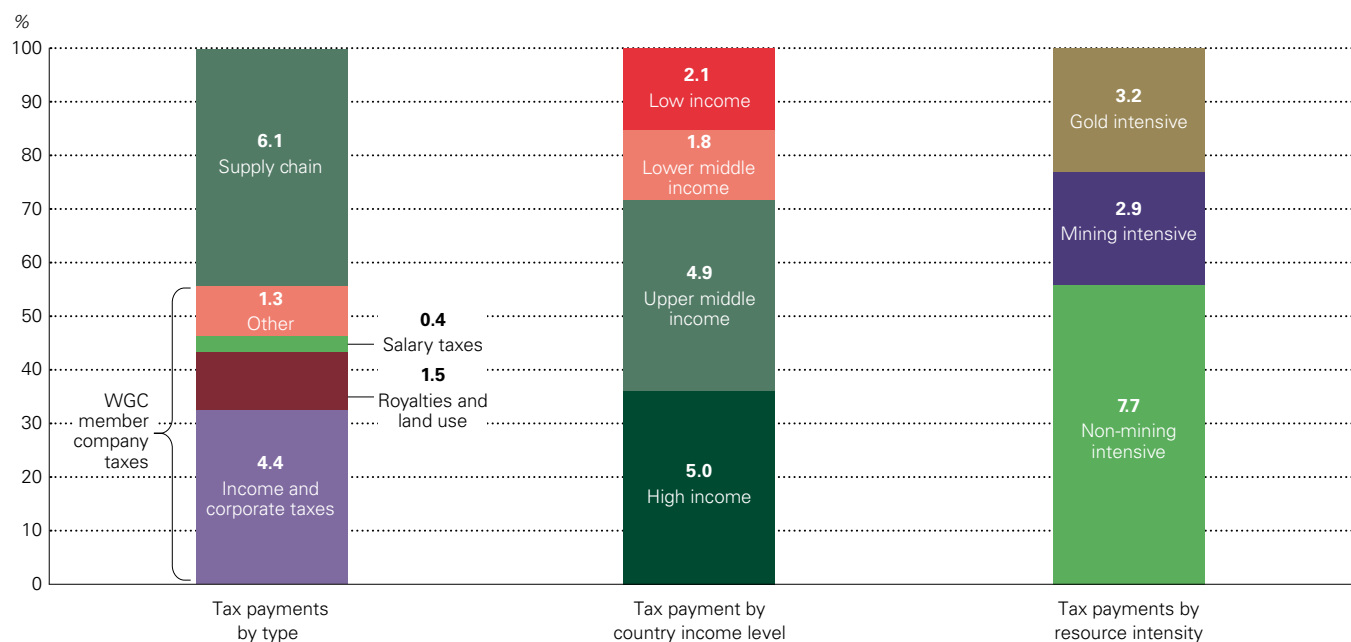
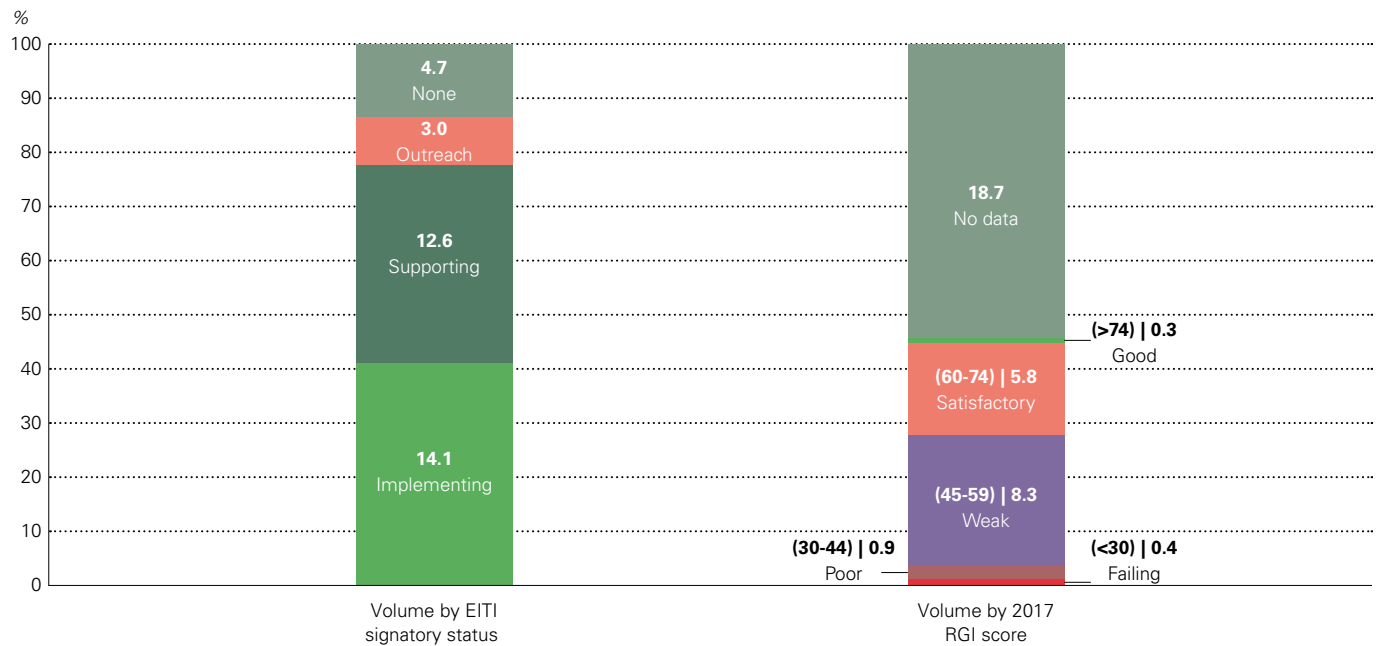


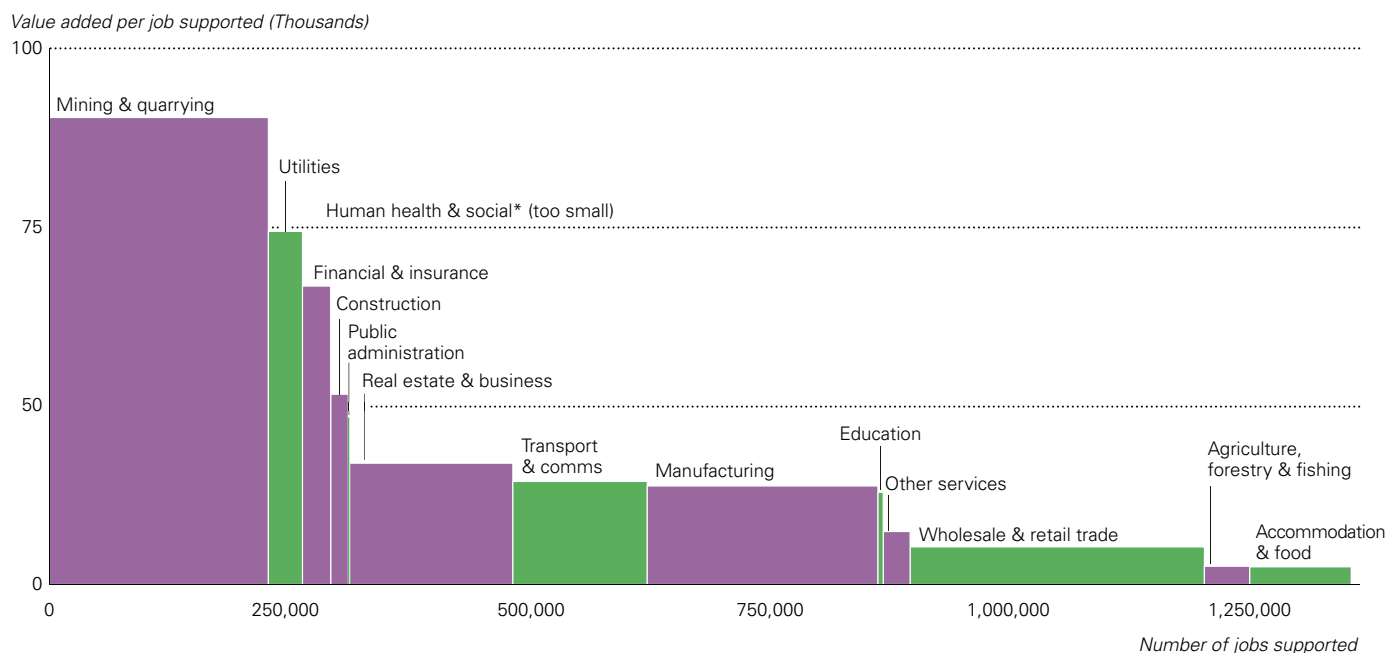
Chart 26: WGC member production volumes by EITI member type and 2017 RGI score (2020, million ounces)



One can get a good understanding of the breadth of the global mining supply chain from **Chart 27**, which depicts the value added per job and the number of jobs in the different sectors. The size of each sector rectangle indicates the total value added supported by gold mining in that sector. Unsurprisingly, the largest value added per job is in the capital-intensive mining sector, followed by utilities and financial services, sectors that even in low-income countries are entirely formal and more productive. It may come as a surprise that even a sector like agriculture is part of the gold mining supply chain, but many companies provide meals for their mining workforce, and that the ingredients for and cooking of these have to be sourced within countries.

There are also many community programmes that help provide support for local agricultural programmes, which in turn sell their goods to miners. Across all countries, the value added per mining employee is 4.5 times larger than in the rest of the supply chain. In general, the higher the value added per job, the higher the salaries. This is discussed in more detail in the section on Supporting Livelihoods.

Chart 27: Value added per job versus the number of jobs for different sectors⁷⁴



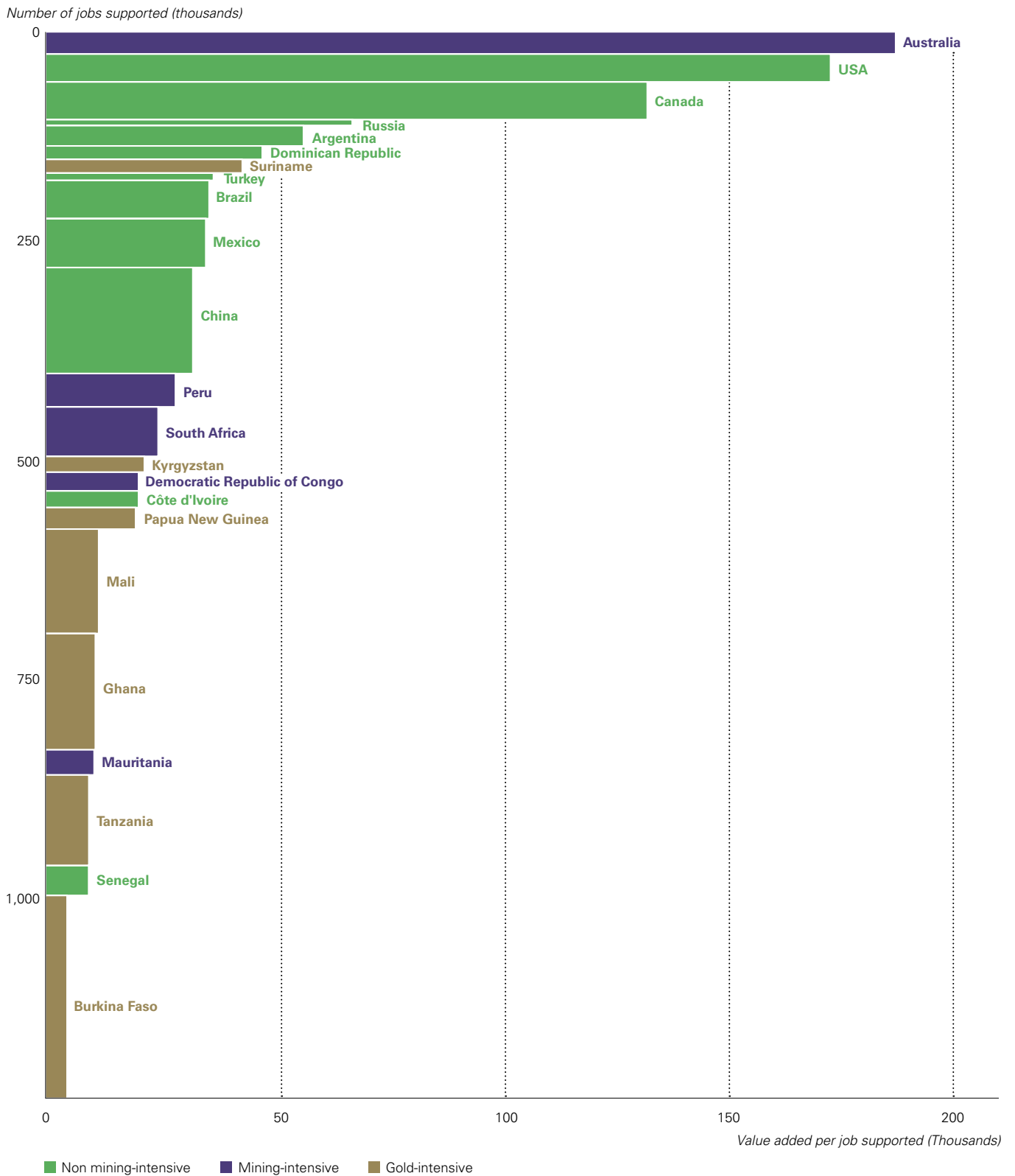
Much of the low value added employment in sectors towards the right-hand side is informal in nature (e.g. small-scale agriculture and trading). This reflects the economic profile of developing countries, where most people are self-employed, do not receive regular salaries and do not benefit from social protection. Indeed, the International Labor Organisation (ILO) estimates that 73% of employment in Sub-Saharan Africa is 'vulnerable'.⁷⁵

Nevertheless, these people, most of whom aren't aware that they are part of a gold supply chain, still profit from the benefits that trickle down to them. This can be seen clearly in **Chart 28**, which shows a very large number of jobs in developing countries, but with on average low value added per job, despite the fact that the jobs with WGC members have a large value added per job.

⁷⁴ Data comes from all 38 countries. Jobs supported only include direct and indirect jobs, and not induced jobs.

⁷⁵ Modelled ILO estimates of vulnerable employment are included in the World Development Indicators database of the World Bank.

Chart 28: Value added per job versus the number of jobs for different countries⁷⁶



⁷⁶ Only countries where WGC member production is larger than 1% of total WGC member production are shown here. Jobs supported only include direct and indirect jobs, and not induced jobs.

World Gold Council Member companies:

- 1 Agnico-Eagle Mines
- 2 Alamos Gold Inc.
- 3 AngloGold Ashanti
- 4 Aura
- 5 B2Gold
- 6 Barrick
- 7 Calibre Mining
- 8 Centerra Gold Inc.
- 9 China National Gold Group Corporation (China Gold)
- 10 Compania de Minas Buenaventura
- 11 Eldorado Gold
- 12 Endeavour Mining Corporation
- 13 Equinox Gold
- 14 Franco-Nevada Corporation
- 15 Golden Star Resources
- 16 Hummingbird Resources
- 17 IAMGOLD Corporation
- 18 Kinross Gold
- 19 Kirkland Lake Gold
- 20 Newcrest Mining Limited
- 21 Newmont
- 22 OceanaGold
- 23 Pretivm
- 24 Resolute
- 25 Royal Gold
- 26 Sandstorm Gold Royalties
- 27 Shandong Gold Group
- 28 Sibanye-Stillwater
29. Torex Gold Resources Inc.
- 30 Wheaton Precious Metals
- 31 Yamana Gold Inc.
- 32 Shandong Zhaojin Group
- 33 Zijin Mining Group Co.

Copyright and other rights

© 2021 World Gold Council. All rights reserved. World Gold Council and the Circle device are trademarks of the World Gold Council or its affiliates.

All references to LBMA Gold Price are used with the permission of ICE Benchmark Administration Limited and have been provided for informational purposes only. ICE Benchmark Administration Limited accepts no liability or responsibility for the accuracy of the prices or the underlying product to which the prices may be referenced. Other third-party content is the intellectual property of the respective third party and all rights are reserved to them.

Reproduction or redistribution of any of this information is expressly prohibited without the prior written consent of World Gold Council or the appropriate copyright owners, except as specifically provided below.

The use of the statistics in this information is permitted for the purposes of review and commentary (including media commentary) in line with fair industry practice, subject to the following two pre-conditions: (i) only limited extracts of data or analysis be used; and (ii) any and all use of these statistics is accompanied by a citation to World Gold Council and, where appropriate, to Metals Focus, Refinitiv GFMS or other identified third-party source, as their source.

World Gold Council does not guarantee the accuracy or completeness of any information. World Gold Council does not accept responsibility for any losses or damages arising directly or indirectly from the use of this information.

This information is not a recommendation or an offer for the purchase or sale of gold, any gold-related products or services or any other products, services, securities or financial instruments (collectively, "Services"). Investors should discuss their individual circumstances with their appropriate investment professionals before making any decision regarding any Services or investments.

This information contains forward-looking statements, such as statements which use the words "believes", "expects", "may", or "suggests", or similar terminology, which are based on current expectations and are subject to change. Forward-looking statements involve a number of risks and uncertainties. There can be no assurance that any forward-looking statements will be achieved. We assume no responsibility for updating any forward-looking statements.



Printed on FSC certified paper which is manufactured entirely with wind energy and contains 100% post-consumer recycled fibre.

This paper is certified by Green Seal for FSC standards which promotes environmentally appropriate, socially beneficial and economically viable management of the world's forests.

World Gold Council
7th Floor, 15 Fetter Lane
London EC4A 1BW
United Kingdom

T +44 20 7826 4700

F +44 20 7826 4799

W www.gold.org