SOCIO-ECONOMIC CONTRIBUTIONS OF SIBANYE-STILLWATER GLOBAL OPERATIONS

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1. Socio-Economic Contributions of Sibanye-Stillwater Global Operations

Minerals have been a foundation of civilization for millennia. And more recent times have seen the reliance on mechanized, high volume, mining of minerals of all kinds grow. A modern economy cannot exist without the products and materials extracted from the earth, and success in surmounting the challenges we will face in coming years depends critically on our continued success in obtaining the elements, ores, and compounds that will support growth.

Putting a value on the products of mining is a daunting task. The steel in buildings, cars, and ships, the cement and stone that paves roads, the many compounds that are basic to everything from pharmaceuticals to electronic components – can one really say what they are worth? It is sufficient to say that a world without mining and minerals would be vastly poorer than what exists today.

This study looks at a different dimension of the value of mining. That is the wealth creation that is fueled by the investors, companies, and workers who carry it out. The process of unlocking the value of minerals that are buried in the earth, to produce concentrated, refined, and more purified elements and compounds that command value on global markets, is a pillar of support for families, businesses, governments and communities. An economy where mining takes place enjoys the benefits of that activity, which, as we demonstrate in this study, are considerable.

This study will focus on one mining and metals processing company – Sibanye-Stillwater, a publicly traded, South African-based firm with 82,788 employees and a $3.1 billion (USD) market cap. We seek to understand how the company's operations add to prosperity and economic opportunity in the places and the communities where it does business.

This understanding is important, because in most places the extraction, refining, processing and recycling of minerals and metals takes place where the resources are located, typically far from population centers. As a result, there is less familiarity with how these activities are conducted, and how their operations can affect livelihoods more broadly across the economy. In the case of Sibanye-Stillwater, as we demonstrate, the benefits of mining and mining-related activities are significant, and travel far beyond the facilities themselves.

Sibanye-Stillwater Global Operations

Sibanye-Stillwater is a young company built on long-standing traditions. It began in 2013 as a South African gold mining company that took the name Sibanye Gold Limited when a subsidiary of Gold Fields Limited, a Johannesburg-based global gold mining company, was spun off in that year. Since that time, the company has grown and diversified into a mining and metals processing company through a series of acquisitions, changing its name in 2017 when it merged with the US-based Stillwater Mining Company.

By 2023 the company had a portfolio of operations, projects, and investments in five continents, becoming the world's largest primary producer of platinum and rhodium, one of the largest producers of palladium, and the leading recycler of platinum group metals (PGM) from spent catalytic converters. Sibanye-Stillwater's recent investments in the production and exploration of lithium, nickel, and other so-called green metals used in the manufacture of batteries, is a new development that is expected to fuel future growth.

The full range of the company's activities is best appreciated from its website (sibanyestillwater.com) and the extensive reports that can be found there. In this study we analyzed the socio-economic contribution of five specific operations that comprise the bulk of its ongoing activities. These are:

- Australian operations. Sibanye-Stillwater acquired the New Century Resources in Queensland near the Gulf of Carpentaria, where it operates a zinc tailings retreatment facility using tailings from the adjacent Century zinc mine, which closed in 2015.

- South African PGM operations. The company has (i) an extensive group of underground and surface mining operations and concentrators located in Kroondal, Rustenburg and Marikana in North West Province, (ii) the Platinum Mile retreatment facility recovering PGMs and chrome adjacent to the Rustenburg operation, and (iii) three exploration projects at varying stages of development on the Bushveld Complex in the Limpopo Province.

- South African gold operations. Sibanye-Stillwater operates three underground mining and surface treatment facilities at Beatrix, Driefontein and Kloof, the Cooke Gold plant that comprises the Randfontein Surface Operation that mines and re-treats historic tailings, as well as other re-treatment, refining, and exploration activities.

- EU operations. These consist of the company's Sandouville nickel reprocessing facility in France as well as plans for the construction of an adjacent facility to produce refined nickel compounds to serve the battery industry, and participation in the Finnish Keliber Lithium project aimed at building a facility to produce high-purity lithium ore.

- US operations. Operating in the richest known deposit of PGM metals in the world, the company's East Boulder and Stillwater (East and West) Mines in Montana produce palladium, platinum and rhodium, and the adjacent Columbus metallurgical complex produces reprocessed PGM metals from spent catalytic converters.

As important as all of these production activities for workers, businesses, investors, and governments in the economies in which the company has a presence, they fall considerably short of describing everything that Sibanye-Stillwater does to improve the social and physical infrastructure in the places the company calls home. The company's strong commitment to supporting the needs and responding to the concerns of the communities where it operates translates into significant resources devoted to economic and social needs.

The analysis here is based on activities which have already taken place, using operating data that are reflected in the company's financial statements. There are some important activities in other geographic areas that are not included in this study, including the PGM operations in Zimbabwe, and projects underway in North America, South America, and western Australia.

It is clear that the operations of Sibanye-Stillwater are global in nature, yet their socio-economic contributions are felt nationally, especially in the portions of the respective countries where the operations take place. Thus, this analysis proceeds by considering each of these five major categories of Sibanye-Stillwater mining and metal processing activities. This section of the report summarizes our findings for all the operations as a whole.

Research Approach

In each of the country-specific analyses, we ask a simple question: what would the national economy look like if Sibanye-Stillwater operations were not present? As a major employer, producer, and taxpayer we could reasonably expect that the reduction in economic activity that would occur in the absence of mining and metal processing activities would be significant.

Yet as sizable as the company's own spending, production, employment and tax contributions are, an economy that no longer had Sibanye-Stillwater would suffer declines much larger. This is because the company's own spending on its labor force, vendors and suppliers, and governments is income to those who receive it. And that income supports further spending across the entire economy. These "knock on" effects from the company's presence make its ultimate economic footprint significantly larger than its own spending flows would suggest.

For purposes of each analysis, we construct a hypothetical "no Sibanye-Stillwater" economy in which the spending of the company on its operations is subtracted, and the economy comes to a new, lower resting point, or equilibrium. A comparison of this hypothetical economy to the actual economy yields an estimate of Sibanye-Stillwater's socio-economic contributions.

A "no-Sibanye-Stillwater" national economy would be missing at least three key economic benefits in comparison to the actual economy of today:

- The jobs, income, spending, and production of the mines and processing facilities themselves.

- The spending of those who receive the mining-related spending as income, spurring further spending, production, and employment.

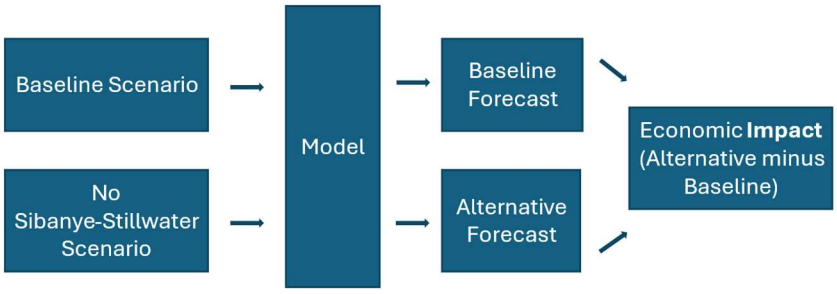
- The value to the economy and to society of the products of PGM mining and processing.

The approach of this study to the assessment of the socio-economic contribution of Sibanye-Stillwater's operations considers the first two dimensions of its benefits listed above in greater detail. The operating data for the PGM operations of Sibanye-Stillwater in each country obtained from published reports and from the company gave a complete accounting of its own production, spending, employment and tax payments. An economic model of the national economy, designed and calibrated specifically for this use, was utilized to discover how the economic flows originating from the company's operations – including it support for supporting communities through investments in schools and other social infrastructure -- propagate into the general economy, supporting more jobs, spending, and incomes in industries with no direct connection to the activities.

It is the third dimension of economic benefit that refers more specifically to the product of mining and processing – the refined ore products that are shipped to customers and integrated into countless products. In the case of PGM metals, gold, nickel, lithium and other minerals, the list of these products is long and varied. It includes everything from the tiny electronic components in our cell phones, the plastics and petrochemicals that are ubiquitous in every kind of product, to environmental equipment that improves the air we breathe.

In a "no-Sibanye-Stillwater" world, these products would not exist and those benefits would be lost. Carefully assessing and quantifying their value is beyond what this study can accomplish – we do not consider product-related benefits as part of the socio-economic contributions estimated in this report. Yet were they to be added there is little doubt that the estimated contributions presented here would be significantly higher.

Figure 1: Policy Analysis with IMPLAN



Since a "no Sibanye-Stillwater" economy cannot be directly observed, it must be constructed with the use of an economic model that can account for the production and spending interrelationships in the national economy. Thus, the research flow involves three basic steps (Figure 1):

- Obtain sufficiently detailed operating information on Sibanye-Stillwater spending on wages and benefits, vendors, capital projects, raw materials, social spending, taxes and other obligations;

- Present this information to an economic model that traces how the loss of this spending cycles through the rest of the economy to produce a "no Sibanye-Stillwater" scenario; and

- Calculate the difference in economic activity measures between this hypothetical economy and the actual economy to assess the company's socio-economic contributions.

The model used in this study is the well regarded IMPLAN policy analysis model that has been utilized in hundreds of published studies. IMPLAN is a platform for conducting economic analysis that represents the South African economy with an input-output (I-O) framework that disaggregates the full economy into 43 separate industries, and estimates their production inter-relationships using extensive datasets on their transactions. All of the I-O tables come from the Organization for Economic Co-operation and Development (OECD) and include distinct transactions between industries, industry output, industry value-added, and final demand. All monetary values in the data are represented in U.S. dollars (USD).

Global Socio-Economic Contributions

The basic finding of this analysis is that the mining, refining, processing, and recycling of minerals and metals by Sibanye-Stillwater is hugely consequential for the economies of the areas in which it operates. That conclusion is amply supported by the country-specific results contained in this report. And they are true when added up to produce global economic contributions as well.

Employment Impacts

When added up across all countries included in this analysis, we estimate that Sibanye-Stillwater is ultimately responsible for the existence of almost 146,000 jobs globally. That figure includes the company's own 82,788 employees, yet it also includes many jobs in other parts of the economy, as shown in Table 1.

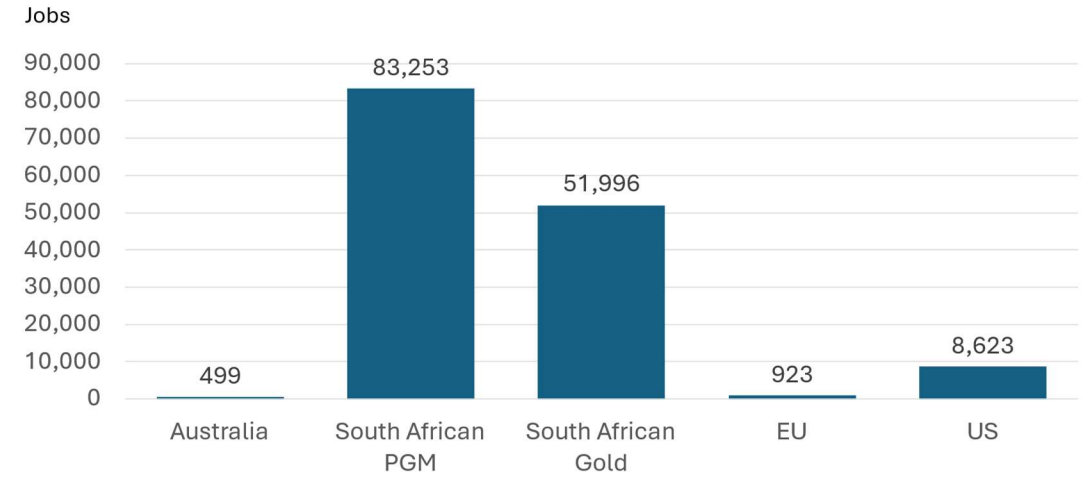
Table 1: Employment Impacts, Jobs

Industry	Impact
Accommodation and Food	3,892
Construction	2,653
Finance and Real Estate	3,832
Government	9,078
Information	1,010
Manufacturing	6,624
Mining	77,668
Professional and Technical Services	2,025
Other Services	1,189
Transportation	3,874
Wholesale/Retail	9,810
Other	23,641
Total	**145,295**

Each country's economy is different, and the nature of Sibanye-Stillwater's operations is quite different as well. But the broad mechanism that induces job growth across the economy is the same – the spending relationships that exist between industries, as well as the patterns of consumer demand for goods and services. Jobs in industries like accommodations and food, transportation, and wholesale/retail come about because of the demand created by the spending that is ultimately fueled by Sibanye-Stillwater operations.

The relative employment intensity of the South African PGM and Gold operations, and the strong induced demand for services, helps produce the largest employment impacts of any of the operations analyzed in this study, as shown in Figure 2.

Figure 2: Employment Impacts of Sibanye-Stillwater Operations by Region, 2023



Source: BBER Analysis

Compensation Impacts

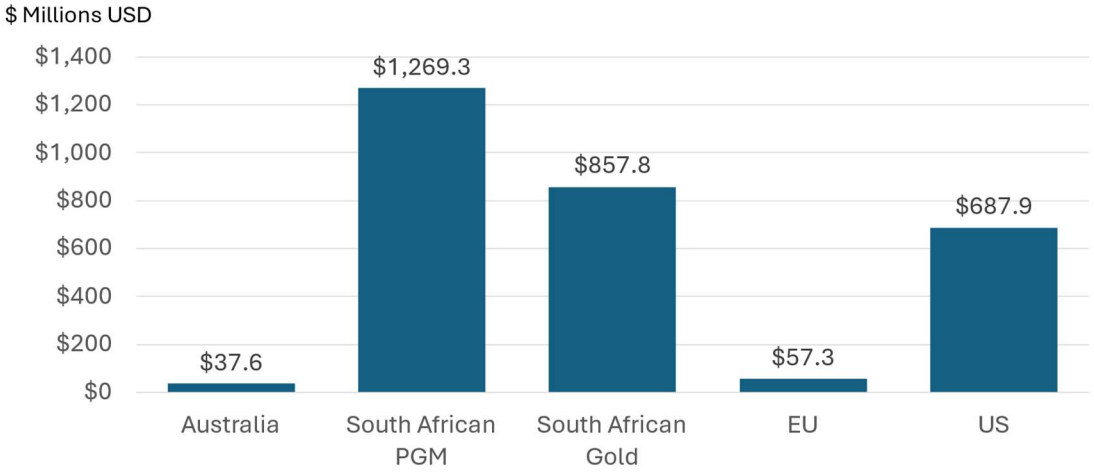
The wages and benefits that workers receive directly or indirectly because of the Sibanye-Stillwater operations in their respective economies is one of the most important reasons why the presence of company operations propagates across a wide range of industries. The significant impacts on employee compensation in the countries with Sibanye-Stillwater operations, as shown in Table 2, reflects the same propagation of impacts across the entire spectrum of industries that was evidenced in the employment impacts of Table 1.

Table 2: Compensation Impacts, $ Millions USD

Industry	Impact
Accommodation and Food	34.8
Construction	97.4
Finance and Real Estate	106.5
Government	243.5
Information	25.3
Manufacturing	150.9
Mining	1,686.7
Professional and Technical Services	293.4
Other Services	18.2
Transportation	64.3
Wholesale/Retail	48.6
Other	140.2
Total	**2,909.8**

Adding up across the countries and operations included in this analysis, we find that $2.9 billion of annual employee compensation exists because of the operations of Sibanye-Stillwater. The largest impact comes in the mining industry which is where much of the company's own payroll is classified. The spending power that is in part fueled by the wages portion of compensation supports the job gains shown in Table 1, which the compensations impacts are also a consequence of those gains.

Figure 3: Employee Compensation Impacts of Sibanye-Stillwater Operations by Region, $ Millions USD, 2023



Source: BBER Analysis

The distribution of compensation impacts across countries again reflects the relative size of the Sibanye-Stillwater operations shown in Figure 3. The high capital intensity and high pay of jobs

in the US region, however, result in a higher share of global compensation impacts coming from that region.

It is important to note that the sizable compensation impacts that occur in these countries because of the presence of Sibanye-Stillwater operations occur each year, adding to the economic security of tens of thousands of households.

Output Impacts

The ultimate support for these job and compensation increases comes from the increased sales of goods and services. Thus, when we look at the impacts across all of the countries on gross receipts of business and non-business organizations – defined as economic output – we see significant contributions.

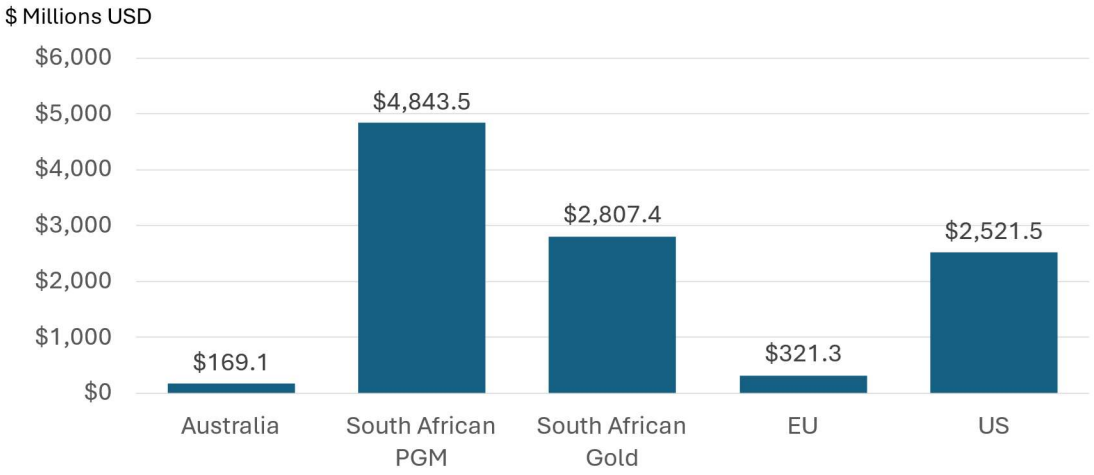
In total, across all of the markets, the presence of Sibanye-Stillwater operations is ultimately responsible for more the $10 billion in additional economic output. This is an economic outcome that is driven by the value of mining's own output, as shown in Table 3. More than two thirds of the total impacts come from gains in mining and manufacturing output. The latter industry contains some refineries, recycling, and stand-alone re-processing facilities.

Table 3: Output Impacts, $ Millions USD

Industry	Impact
Accommodation and Food	126
Construction	281
Finance and Real Estate	665
Government	462
Information	161
Manufacturing	1,710
Mining	5,628
Professional and Technical Services	370
Other Services	65
Transportation	224
Wholesale/Retail	252
Other	719
Total	**10,663**

The impacts shown in the table give some insights on how the impacts presented in this report come about. They originate with the value of what is produced at the Sibanye-Stillwater facilities – the minerals, metals, and compounds that go into final products of all kinds. This supports the spending of the company on labor, intermediate inputs, vendor goods and services, fueling jobs and income that supports knock on spending that builds impacts further.

Figure 4: Economic Output Impacts of Sibanye-Stillwater Operations by Region, $ Millions USD, 2023



Source: BBER Analysis

The output impacts are largest in the countries that have the largest scale production facilities, as is clear from Figure 4. This largely reflects the stage of development of each of these operations, which in the case of Australia and the EU countries is more future oriented than the longer established operations in South Africa and the United States.

Summary and Conclusion

This is a study of how the operations of a relatively young, rapidly evolving mining and metal refining company's operations create value and add to the economic prosperity of the countries in which it operates. The aggregate contributions of its major operations add to the economies of the four continents studied in this report are large by any measure. As the value of minerals, materials, and compounds mined from the earth continues to grow, there is every sign that these contributions are certain to continue.

About This Study

This study was conducted by the Bureau of Business and Economic Research (BBER) at the University of Montana, a university-based research center in the western United States. The BBER is a 75-year-old applied business research center with a mission to help people understand the economy in which they work and live. The author of this report is Patrick M. Barkey, Ph.D., Director of Research at the BBER. The study was conducted in the Fall of 2023.

We would like to thank Derek Sheehan from the BBER for his key role in conducting the analysis presented in this study. We also thank the team at Sibanye-Stillwater for their assistance in providing information and advice.

All analysis, writing, and conclusions of this report are the sole product of BBER, which is responsible for all errors and omissions.

2. Australian Operations

The Australian region of Sibanye-Stillwater consists of two ongoing activities: the Century zinc tailings treatment operations acquired from New Century Resources Limited in February 2023, and the exploration and analysis of the recently acquired Mt. Lyell copper mine in Tasmania. Both of these operations were active in 2023, although only the Century zinc tailings facility in Queensland was in production. Through their purchases, wages, tax payments, and sales, the Australian operations have created new economic flows that have made the economy larger. The first step in the estimation of those economic contributions is to more fully describe the scale and scope of their operations.

Century Zinc Tailings Operations

The re-processing of mine waste to produce zinc concentrate at the site of the old Century mine represents an important new life for what once ranked as one of the largest zinc mines in the world. During its 16 years of operation, from 2009 until 2015, the mine employed more than 1,000 people, shipped more than 13 million tons of zinc concentrate, and paid more than $247 million to Queensland in taxes, royalties, and rates. Under the auspices of a new entity, New Century Resources Limited, which acquired ownership of the mine in 2017, a vital economic asset to the community was retained with new investment and a new production process.

New Century Resources was acquired by Sibanye-Stillwater in 2022, with a handover of assets taking place in May 2023.

The Century zinc tailings operation is located at Lawn Hill, 250 kilometers northwest of Mount Isa in the Lower Gulf of Carpentaria, Queensland, Australia. In addition to the extraction, processing, and redepositing of tailings from mining operations stored in the tailings storage facility (TSF) onsite, there are two additional components to the operations: a 304-kilometer underground pipeline that transports the zinc concentrate from the facility, and a port operation at Karumba that transfers the product to ships anchored in the Gulf of Carpentaria and delivers it to markets.

Century is the largest zinc reprocessing operation in Australia and one of the 15th largest zinc producers in the world. It has a sizable economic footprint in the region. In 2023, it processed over 6,000 kilotons of zinc ore, ultimately producing 76 kt of zinc metal with gross revenue of $122 million ($USD). The facility employed 254 workers, including 24 contractors working onsite. Additionally, the company conducted $9 million ($USD) in capital expenditures on ore reserve development and other projects.

Mt Lyell Mine Evaluation and Development

The acquisition of the Mt Lyell underground copper mine, an inactive facility in Tasmania that was first opened in 1894, was completed by Sibanye-Stillwater in 2023. The company currently employs 23 workers in testing and evaluation of the facility for potential re-development.

An additional 13 workers in overall Australian operations bring the company's current employment total in all continental operations to 288 workers, including contractors.

Estimating the Economic Contributions of Sibanye-Stillwater Australian Operations

As a natural resources industry, mining activity takes place where the resource is located. Such locations are often distant from population centers, escaping the notice of those with little or no direct economic connection to the facilities. Yet as a high valued-added, capital-intensive production process, mining operations generate substantial, positive economic flows that materially impact the well-being of individuals, businesses, and governments in the communities and countries in which they operate. The purpose of this analysis is to highlight the scope and magnitude of the contributions to the Australian economy that occur because of the operations of Sibanye-Stillwater.

This objective can be accomplished by considering how the Australian economy would look if the facilities did not exist. This is a purely hypothetical question – no closure or shutdown scenario for the mining operations is contemplated or described. We consider a hypothetical, "no mining" economy in which the mining activities are no longer present – where the production, refining, transportation, and other activities are absent, and the revenues, jobs, wages, vendor spending, tax payments, and other economic flows are subtracted from what occurs today.

A comparison of the actual economy to the "no mining" economy constructed for this study reveals the economic contribution of Sibanye-Stillwater's Australian operations.

A key finding of this research is that the contributions of mining to the economy are substantially larger than the spending, employment, and business revenues of the mine itself. There are jobs, incomes, and government programs that owe their existence to the presence of mining operations even though there is no direct connection to mining. This is because the economic flows that mining generates are received by workers, businesses, and governments as income, and are partially re-spent in the broader economy, supporting other workers and businesses. This "second round" of spending creates new demand for everything from health care to retail trade, supporting those activities and spawning subsequent new rounds of spending through the same process.

The end result is a new, equilibrium level of economic activity in an economy that includes mining that is higher by more than the activity of the mine itself.

The key to assessing the economic contributions of the mining operations is the creation of the "no mining" scenario for the Australian economy that is the baseline for comparison. Since this

cannot be directly observed, it must be estimated with an economic model that accounts for the interactions within the economy. This study used the well-known IMPLAN model for the national economy that has been employed in hundreds of peer-reviewed studies. At the heart of the model is an input-output table that estimates the flows of resources between 46 different subsectors of the national economy. The parameters that govern these flows are estimated every three years by the Organization for Economic Cooperation and Development (OECD) individually for 76 countries around the world. The Australian model is used to examine how economic activity across the scope of the economy would change in a "no mining" scenario where the operations of Sibanye-Stillwater at New Century and Mt Lyell were not present.

Summary of Findings

A comparison of the actual economy to an economy where the mining operations of Sibanye-Stillwater did not exist reveals that, in aggregate, those operations ultimately support:

- 499 permanent, year-round jobs, spread across the entire spectrum of industries in the economy;
- $37.6 million (USD) in annual, recurring, employee compensation, representing a significant boost in the spending power of workers and their families;
- $169.1 million (USD) in national economic output, much of which is ultimately induced through the spending of Sibanye-Stillwater and its workers on goods and services produced throughout the economy, and
- $33.4 million (USD) in annual tax revenue due to growth in the tax base.

All of these economic contributions include: the economic activity of the mining operations themselves, the activity of non-Sibanye-Stillwater companies that have linkages with mining operations, and the induced economic activity caused as spending is received by businesses and governments as income supporting additional impacts.

It is important to note that these estimates of the jobs, compensation, and economic output in the national economy that are due to the presence of Sibanye-Stillwater mining operations in Queensland and Tasmania reflect the operational activity of the most recent complete calendar year (2023). They do not reflect the likely future of development of those facilities, which would add additional jobs and spending from both the capital investments as well as the jobs and incomes those investments would ultimately support.

It is useful to present these findings in greater detail to achieve a better understanding of how they came about.

Employment Impacts

The jobs in the Australian economy that owe their existence to the mining operations of Sibanye-Stillwater are well in excess of the number of jobs at the facilities themselves. As shown in Table 4, those additional jobs are found in a wide range of industry categories.

Table 4: Employment Impacts

Industry	Impact
Accommodation and Food	27
Construction	6
Finance and Real Estate	19
Government	39
Information	9
Manufacturing	20
Mining	289
Professional and Technical Services	13
Other Services	6
Transportation	10
Wholesale/Retail	36
Other	25
Total	**499**

While the preponderance of job impacts are from the mining operations themselves, significant numbers of jobs in unrelated sectors of the economy exist in the Australian economy today because of mining activity. These job impacts come about from three sources of spending.

The first is the vendor spending by Sibanye-Stillwater. In 2023 the company spent $1.6 million ($USD) for goods and services, approximately 42 percent of which was sourced within Australia. Additionally, Sibanye-Stillwater spent approximately $400,000 on training and on payments to meet its obligations related to the long-standing Gulf Community Agreement as part of its New Century operation. This spending supports additional jobs shown in other industries in the tables.

Secondly, the considerable compensation received by employees at the mining facilities is available for spending in the local and regional economy as well. The more than $27 million paid to workers translates into significant revenue for Australian companies that receive this new spending, supporting jobs, income, and knock-on impacts across the economy.

Finally, the taxes paid by the company and its workers are received as revenues to local and national governments, supporting public sector jobs and spending.

All of these mechanisms are evident from the job impacts by industry categories shown in Table 4. The diversity of economic activities with job impacts from mining activities is remarkable, including new jobs at restaurants, banks, manufacturers, and wholesale and retail businesses. This analysis demonstrates how the economic activity at the mining operations propagates across the entire economy.

Output Impacts

Another dimension of the economic contributions of mining to the Australian economy is how mining operations impact business revenues. If the Sibanye-Stillwater operations in Queensland and Tasmania were not present, those revenues would be smaller. The support that mining provides to the economic output of the major sectors of the economy is widespread, as shown in Table 5.

Table 5: Output Impacts, $USD Millions

Industry	Impact
Accommodation and Food	2.0
Construction	1.8
Finance and Real Estate	12.4
Government	3.9
Information	2.1
Manufacturing	6.5
Mining	122.5
Professional and Technical Services	2.2
Other Services	0.6
Transportation	2.3
Wholesale and Retail Trade	5.0
Other	7.7
Total	**169.1**

These output impacts broadly exhibit the same basic pattern as the job impacts of Figure 1, but there are important differences. These differences reflect the varying employment intensity of different sectors of the economy. As a capital-intensive, high value-added sector, mining's contribution of $122.5 million accounts for a larger proportion of the overall $169.1 million output impact, as shown in Table 5. At the other extreme, the relatively high employment intensity in industries such as retail and wholesale trade make their economic output impact shares somewhat smaller than their job impacts would suggest.

Nonetheless, the output impacts shown in Table 5 portray a different dimension of Sibanye-Stillwater's contribution to the Australian economy that results from its mining operations. In the absence of those operations, businesses in these industries would realize a significant decline in their revenues as well as their economic output.

Compensation Impacts

A successful economy is one that supports the livelihood and well-being of its population. The mining activities of Sibanye-Stillwater in Queensland and Tasmania make a meaningful contribution to that objective. In total, we estimate that $37.6 million in annual, recurring compensation is received by workers and their families in the national economy because of the presence of the company's operations.

As shown in Table 6, most of these compensation impacts are accounted for by the jobs at the mining facilities themselves. This is because of the nature of mining. It is a capital-intensive industry that has very high levels of productivity per worker and can pay salaries and benefits well above the economy-wide average. Yet the table shows that workers across the entire spectrum of the economy receive significant compensation from jobs that owe their existence to the presence of Sibanye-Stillwaters mining activities.

Table 6: Compensation Impacts, $USD Millions

Industry	Impact
Accommodation and Food	0.6
Construction	0.3
Finance and Real Estate	1.2
Government	2.3
Information	0.5
Manufacturing	1.0
Mining	27.1
Professional and Technical Services	0.8
Other Services	0.1
Transportation	0.5
Wholesale and Retail Trade	1.7
Other	1.4
Total	**37.6**

Workers in industries with little apparent connection to mining, such as banking, services, and retail trade, have livelihoods that nonetheless depend on those mining operations. The compensation outside of the direct wages and benefits paid to Sibanye-Stillwater workers increases the capacity of those households to spend on goods and services sourced locally that ultimately supports the prosperity of communities.

Tax Impacts

The larger economy that comes about because of the presence of Sibanye-Stillwater's zinc tailings processing operations creates a larger tax base that can contribute to the operations of government. Mining-related activities have a special role in the national tax base, and so the impacts of the company's operations on annual tax revenues are substantial, as shown in Table 7.

Table 7: Tax Impacts, $ USD Millions

Tax Category	Impact
Enterprises(Corporations)	13.7
Households	7.1
Other Taxes on Production less Subsidies	12.5
Total	**33.4**

The tax categories shown in the table are OECD classifications which contain a variety of national and regional taxes. Corporate profits tax are included in taxes on enterprises, which comprise the largest portion of the taxes paid to government that are due to the operations of Sibanye-Stillwater. The next largest category, Other Taxes on Production less Subsidies, include a variety of royalties and other mining production taxes.

The size of the tax impacts reflects not only the taxes paid directly by mining activities themselves, but also taxes paid throughout the economy that are induced and indirectly supported by the economic flows from mining activity.

Discussion and Summary

In an important sense, this study is a confirmation of what most companies in extraction industries are already keenly aware of: the production, refining, and transportation of mineral products is a hugely significant economic activity. What is not as well known, and which this study has demonstrated, is that the wealth derived from harnessing the value of minerals propagates to the rest of the economy as well. Businesses, workers, and governments enjoy more revenues, wages, and tax collections beyond those with a direct connection to the mining activity that is their ultimate source.

Those facts are best appreciated by considering how the economy would perform if mining did not take place. Removing the economic flows that originate from the mining and refining minerals shrinks the economic pie by more than the arithmetic subtraction of mining jobs, wages, and spending would suggest. Any interruption in spending that is due to mining activity also interrupts the income of those who receive it, reducing the spending that income helped to support. A full assessment of how these "knock-on" effects spread through the broader economy, as is conducted here, reveals the full contribution to the economy that mining directly and indirectly brings about.

In the case of mining, these contributions are larger than many other industries, for at least three reasons:

- The major input to mining production – the zinc tailings from the former Century mine in this case – is a made-in-Australia product. In contrast, business activities that rely more on inputs sourced from abroad direct more spending offshore, siphoning off some of the economic benefit.

- The highly capitalized nature of mining makes workers highly productive, supporting higher wages and benefits than many other sectors. This makes mining jobs more impactful in fueling the spending that supports jobs and investment elsewhere.

- Mining punches above its weight in terms of tax contributions to local, state, and national governments, mainly because of special taxes related to resource extraction. This provides more resources and support to public sector employment and other activities.

This study is based on actual operating information on Sibanye-Stillwater facilities in Australia for the year 2023. The information was provided by the company and is also available to the public in its annual reports published online.

Conclusion

The basic finding of this study is that the production, transportation, and exploration activities in Queensland and Tasmania conducted by Sibanye-Stillwater make significant contributions to economic prosperity in the country as a whole. This is based on an analysis of the company's two ongoing activities: the re-processing of mining waste to produce zinc concentrate at the old Century mine site in the Lower Gulf of Carpentaria in Queensland, as well as the smaller, feasibility analysis being conducted at the inactive Mt. Lyell copper mine in Tasmania.

Using information on actual operations in calendar year 2023, as well as a national economic model specifically calibrated and assembled for this purpose, a comparison was made between the actual Australian economy and a hypothetical, "no mining" economy in which the Sibanye-Stillwater facilities were not present.

Based on that comparison, we estimate that:

- 499 permanent, year-round jobs, spread across the entire spectrum of industries in the economy;
- $37.6 million ($USD) in annual, recurring, employee compensation, representing a significant boost in the spending power of workers and their families;
- $169.1 million ($USD) in national economic output, much of which is ultimately induced through the spending of Sibanye-Stillwater and its workers on goods and services produced throughout the economy, and
- $33.4 million each year in tax revenues paid to national and regional governments,

owe their existence to the mining activities conducted by Sibanye-Stillwater. These substantial economic contributions are well in excess of the jobs, compensation, output, and tax payments of the mine itself, and underscore how the wealth generated from mining benefits the economy as a whole.

3. South African Platinum Group Metals Operations

The business of mining, refining, and recycling Platinum Group Metals (PGM's), which include platinum, palladium, rhodium, ruthenium, osmium, and iridium, has experienced a new growth trajectory with modern methods of producing petrochemicals, plastics, and environmental emission control components. Long prized as both an investment vehicle and for use in the jewelry industry, these industrial uses were significantly impacted by the use of PGM's for catalytic converters in motor vehicles – it is estimated that the automobile industry accounts for 50 percent of worldwide PGM demand today. This has also spawned a significant recycling industry, which produced roughly 1.2 million ounces of platinum, 2.2 million ounces of palladium, and 7.7 zones of rhodium last year.

85 percent of known global PGM reserves are contained in the Bushveld Igneous Complex, a geologically unique formation in South Africa contained within the historic Transvaal province, straddling the North West, Gauteng, Limpopo, and Mpumalanga provinces. 50 percent of global platinum production and 30 percent of palladium production is sourced from this region.

The PGM operations of Sibanye Stillwater in South Africa encompass (i) an extensive group of underground and surface mining operations and concentrators located in Kroondal, Rustenburg and Marikana in North West Province, (ii) the Platinum Mile retreatment facility recovering PGMs and chrome adjacent to the Rustenburg operation, and (iii) three exploration projects at varying stages of development on the Bushveld Complex in the Limpopo Province. The company also operates facilities in neighboring Zimbabwe that are not included in this analysis.

Research Approach

An understanding of what Sibanye-Stillwater mining and processing operations in South Africa contribute to the health and vitality of the domestic economy can be accomplished by imagining how households, businesses, and government services would fare if those operations did not take place. This purely hypothetical exercise allows us to think about how mining and processing operations ultimately add to the economy, by considering how economic activity is ultimately affected by the jobs, spending, and production of the Sibanye-Stillwater PGM facilities.

A "no PGM" South African economy would be missing at least three key economic benefits in comparison to the actual economy of today:

- The jobs, income, spending, and production of the mines and processing facilities themselves.
- The spending of those who receive the mining-related spending as income, spurring further spending, production, and employment.
- The value to the economy and to society of the products of PGM mining and processing.

The approach of this study to the assessment of the socio-economic contribution of Sibanye-Stillwater's PGM operations in South Africa considers the first two dimensions of its benefits listed above in greater detail. The operating data for the PGM operations of Sibanye-Stillwater in South Africa obtained from published reports and from the company gave a complete accounting of its own production, spending, employment and tax payments. An economic model of the national economy, designed and calibrated specifically for this use, was utilized to discover how the economic flows originating from PGM mining and processing propagate into the general economy, supporting more jobs, spending, and incomes in industries with no direct connection to the activities.

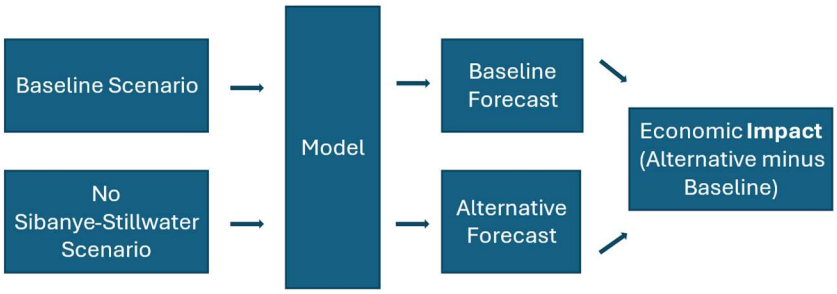
It is the third dimension of economic benefit that refers more specifically to the product of mining and processing – the refined ore products that are shipped to customers and integrated into countless products. In the case of PGM metals, the list of these products is long and varied. It includes everything from the tiny electronic components in our cell phones, the plastics and petrochemicals that are ubiquitous in every kind of product, to environmental equipment that improves the air we breathe.

In a "no PGM" world, these products would not exist and those benefits would be lost. Carefully assessing and quantifying their value is beyond what this study can accomplish – we do not consider product-related benefits as part of the socio-economic contributions estimated in this report. Yet were they to be added there is little doubt that the estimated contributions presented here would be significantly higher.

Policy Analysis with IMPLAN

The approach to assessing socio-economic contributions is based on a comparison of two futures for the South African economy, as depicted in Figure 5. The baseline scenario continues PGM mining and processing operations exactly as they were for the last complete calendar year (2023). A second future estimates how the national economy would perform if the Sibanye-Stillwater PGM operations did not exist. This is not a shutdown scenario – none of the actual steps that would be conducted in an actual closure are considered or represented in the analysis. Rather, it is a hypothetical scenario that simulated how the economy would have performed if the PGM operations never existed.

Figure 5: Policy Analysis with IMPLAN



Since an economy that does not include Sibanye-Stillwater PGM operations cannot be directly observed, it must be estimated with the use of an economic model. The purpose of the model is to consider the interactions between mining activities and the rest of the national economy. Those interactions are important because they embody how the considerable economic flows generated by mining and processing activities ultimately support the activities of separate, unrelated sectors of the economy.

The model used in this study is the well regarded IMPLAN policy analysis model that has been utilized in hundreds of published studies. IMPLAN is a platform for conducting economic analysis that represents the South African economy with an input-output (I-O) framework that disaggregates the full economy into 43 separate industries, and estimates their production inter-relationships using extensive datasets on their transactions. All of the I-O tables come from the Organization for Economic Co-operation and Development (OECD) and include distinct transactions between industries, industry output, industry value-added, and final demand. All monetary values in the data are represented in U.S. dollars (USD).

The Direct Contribution of Sibanye-Stillwater PGM Operations

The first step in conducting the analysis of the Sibanye-Stillwater PGM operations in South Africa is to gather information on the company's direct contributions – defined as the spending, wages, employment, production, and sales of the company itself. These contributions are clearly lost to the economy in a "no PGM" scenario. They also form the basis for estimating the further impacts those direct contributions have on other parts of the national economy.

Sibanye-Stillwater also has extensive mining and processing operations for its gold production and processing activities, which we analyze in a separate section of this report. In this section we restrict our attention to PGM operations. These PGM operations include:

- Marikana, consisting multiple mining shafts, eight concentrators, smelters, refineries, hospitals, medical centers, workshops, laboratories, accommodations quarters and water treatment plants;

- Rustenburg, comprising multiple mining shafts, four concentrators, hospitals, medical centers, workshops, laboratories, offices and other facilities as above;

- Platinum Mile, a tailings retreatment facility located immediately adjacent to the Rustenburg operation, which recovers PGMs and chrome;

- Kroondal, consisting of mining shafts, separation plants, concentrators, workshops, offices, water treatment and other facilities;

- The development activities at Akanani, Limpopo, and Blue Ridge developing new PGM resources.

The breadth and scale of these operations is reflected in the direct contributions of Sibanye-Stillwater PGM operations. Based on operating data for the year 2023, these amounted to:

- 47,405 jobs across all PGM facilities;

- $823 million (USD) in annual, recurring, employee compensation;

- $186 million (USD) paid in annual production-related taxes, and an additional $231 million paid in corporate profits taxes;

- $3.9 million in vendor spending.

The PGM operations of Sibanye-Stillwater PGM operations are the source of funding and support for a number of programs and projects conducted in their communities whose aim is to improve employment equity, local economic development, workforce skills, housing, public health and community infrastructure. This spending is part of the Social Labour Plans (SLP's) submitted by mining companies as part of their mining rights applications.

In 2023 there were 21 ongoing projects associated with the mines at Kroondal, Rustenburg, and Marikana. These included projects in agricultural development, education and skills development, environmental management, health care and social services, and public infrastructure. Current budgets call for $9.1 million USD in total spending on all funded projects, of which $1,5 million was spent in 2023.

Additionally, the company conducts a wide variety of Corporate Social Responsibility (CSR) activities that address broad community needs. There were a number of initiatives funded and supported by Sibanye-Stillwater PGM operations in 2023, addressing needs in early childhood development, youth development, social employment, support of vulnerable populations, wellness, environmental needs, housing, food security and employee volunteerism. CSR spending was $29 million in 2023.

A "no PGM" scenario for the national economy would see these substantial contributions lost. It would also mean that those businesses, households and governments who currently receive

this spending as income would lose the fuel for their own spending elsewhere in the economy. We now turn to an examination of these impacts.

The Socio-Economic Contributions of Sibanye-Stillwater PGM Operations

An economy that does not include Sibanye-Stillwater PGM operations is smaller by more than the activity of the facilities themselves. This is because those who receive the wages, vendor spending, tax payments and other economic flows as income re-spend a portion of what they receive in the broader economy, supporting other jobs and spending as a result. A "no PGM" economy ultimately comes to a new equilibrium, or resting point, that is smaller than the economy of today. A comparison of this hypothetical, "no PGM" economy to the actual economy reveals the economic contributions of PGM mining and processing.

This comparison shows that:

- 83,253 jobs across a wide spectrum of industries;
- $1.26 billion (USD) in employee compensation;
- More than $4.8 billion in economic output;
- $544.6 million in annual tax payments,

occur in the national economy because of the PGM operations of Sibanye-Stillwater. These impacts extend beyond the mining industry itself.

The breakdown of employment gains due to Sibanye-Stillwater PGM operations shown in Table 8 shows how spending and other economic flows that originate from those operations propagate across the rest of the economy. Unsurprisingly, it is the mining industry that contributes the most to the overall jobs impact of Sibanye-Stillwater's PGM operations, accounting for about 57 percent of the total. But the job gains in industries with no direct connection to mining – including wholesale/retail, finance, and accommodations – demonstrate how the knock-on effects of mining activity support jobs.

Table 8: Employment Impacts

Industry	Impact
Accommodation and Food	1,942
Construction	715
Finance and Real Estate	1,967
Government	4,513
Information	580
Manufacturing	3,506
Mining	47,491
Professional and Technical Services	912
Other Services	490
Transportation	2,022
Wholesale/Retail	5,700
Other	13,414
Total	**83,253**

Another dimension of Sibanye-Stillwater's socio-economic contributions is the impact its PGM operations make on the economic livelihood of workers and their households. A national economy where PGM operations do not occur is one where workers earn more than $1.2 billion USD less than they do today.

Table 9: Compensation Impacts, $USD Millions

Industry	Impact
Accommodation and Food	7.8
Construction	3.6
Finance and Real Estate	57.8
Government	74.8
Information	13.2
Manufacturing	45.6
Mining	824.7
Professional and Technical Services	159.5
Other Services	4.4
Transportation	17.6
Wholesale and Retail Trade	19.5
Other	40.9
Total	**1,269.3**

The compensation impacts by industry shown in Table 9 also depict a wide variety of industries with substantial contributions to the total compensation impact. These impacts recur each year and support considerable spending that supports jobs and livelihood elsewhere.

It is also clear from a comparison of the job impacts and the compensation impacts by industry in the two tables that the mining and processing of PGM metals by Sibanye-Stillwater supports jobs at all compensation levels in the economy.

The spending in the national economy that is fueled by the presence of Sibanye-Stillwater PGM operations shows up in the revenues of businesses as well. Two thirds of the more than $4.8 billion in annual, recurring gross revenues (economic output) to businesses due to PGM operations are received by the mining industry itself, as shown in Table 10. That high proportion is due to the high value that refined PGM metals command on the global market.

But Table 10 also demonstrates that businesses in industries with no direct connection to PGM mining and processing operations owe a sizable fraction of their revenues to mining. This includes businesses in finance and real estate, manufacturing, and wholesale and retail trade. The fact that these kinds of businesses realize output gains of this magnitude underscores the significance of PGM mining and processing as a generator of wealth and opportunity across the entire spectrum of economic activity.

Table 10: Output Impacts

Industry	Impact
Accommodation and Food	37.7
Construction	16.1
Finance and Real Estate	295.6
Government	133.7
Information	87.5
Manufacturing	372.6
Mining	3,221.4
Professional and Technical Services	52.2
Other Services	19.4
Transportation	92.2
Wholesale and Retail Trade	133.6
Other	381.5
Total	**4,843.5**

A national economy that does not include the PGM mining and processing activities of Sibanye-Stillwater is an economy with a lower tax base from which to secure resources for the support of government. The mining sector plays a key role in tax support, and in a "no PGM" scenario, the reduction in revenues is significant.

The IMPLAN model estimates these impacts for broad categories of taxation, as shown in Table 11. These are the differences in tax revenues in the two scenarios for the South African economy considered in this study: the baseline economy with no changes, and the hypothetical "no PGM" economy constructed with the IMPLAN model where the PGM activities of the company are removed. Thus, the tax impacts shown in the Table are due to all of the activity in the economy that is ultimately supported by the presence of PGM mining and processing, both from mining itself and across the rest of the economy.

Table 11: Tax Impacts, $ USD Millions

Tax Category	Impact
Employee Compensation	13.8
Enterprises(Corporations)	231.1
Households	108.2
Other Taxes on Production less Subsidies	191.5
Total	**544.7**

Most of the more than half billion-dollar (USD) recurring tax impact of the PGM activities of Sibanye-Stillwater in the national economy come from taxes levied at the corporate level. The largest are the taxes on corporate profits, at $231.1 million per year, and production-related taxes of $191.5 million per year. Other tax impacts reflect both income-related taxes on wages as well as contributions to social security insurance plans.

Conclusion

The basic finding of this study is that the ultimate socio-economic contributions made by the extensive PGM mining and processing activities of Sibanye-Stillwater throughout the North West Province are significant and widespread. This is based on a detailed analysis of the operations of the company's PGM operations:

- the operations of the three, mining production and processing hubs at Marikana, Rustenburg, and Kroondal, with their associated concentrators, refineries, and supporting facilities (including hospitals, accommodations, and offices and workshops);

- the tailings processing and recovery operations adjacent to Rustenburg at the Platinum Mile facilities; and

- the development operations underway at differing stages in Akanani, Limpopo, and Blue Ridge.

The analysis also recognizes the significant spending of the company on training and development, as well as its significant support of communities through its corporate social responsibility initiatives.

Using information on actual operations in calendar year 2023, as well as a national economic model specifically calibrated and assembled for this purpose, a comparison was made between the actual South African economy and a hypothetical, "no PGM" economy in which the Sibnaye-Stillwater PGM activities did not take place.

Based on that comparison, we estimate that:

- 83,253 permanent, year-round jobs, spread across the entire spectrum of industries in the economy;

- $1.269 billion ($USD) in annual, recurring, employee compensation, representing a significant boost in the spending power of workers and their families;

- $4.843 billion ($USD) in national economic output, much of which is ultimately induced through the spending of Sibanye-Stillwater and its workers on goods and services produced throughout the economy, and

- $544.7 million ($USD) in tax revenue collected by government,

owe their existence to the PGM mining and processing activities conducted by Sibanye-Stillwater. These substantial economic contributions are well in excess of the jobs, compensation, output, and tax payments of the mine itself, and underscore how the wealth generated from mining benefits the economy as a whole.

4. South African Gold Operations

Gold mining and processing has been a core activity of Sibanye-Stillwater from its origins as Sibanye Gold in South Africa in 2013. In the years since then, through a series of acquisitions and partnerships, those activities have grown in size and prominence, now employing tens of thousands of workers and accounting for billions of dollars (USD) of revenue. The gold operations of Sibanye-Stillwater in the national economy are a highly capitalized, high value-added production activity that bring considerable benefits to workers, businesses, and governments.

This study describes and quantifies those economic contributions, using actual operating data and other information on spending and production relating to gold operations for the year 2023.

The gold mining, processing, and refining facilities of Sibanye-Stillwater are contained in the Witwatersrand Basin (or the Rand), a 56-kilometer-wide escarpment (fault) running roughly east-west, containing Johannesburg and other cities that has historically been a rich resource for gold extraction. Sibanye-Stillwater currently has:

- three underground mining and surface treatment facilities at Beatrix, Driefontein and Kloof, all containing a mixture of shallow, deep, and ultra-deep shafts, in addition to processing facilities and tailings storage facilities;
- the Cooke Gold plant that comprises the Randfontein Surface Operation that mines and re-treats historic tailings;
- a majority share in the DRDGOLD treatment facilities that process tailings to extract more mineral value;
- a 44% interest in Rand Refinery Proprietary Limited (Rand Refinery), one of the largest refiners of gold globally, and the largest in Africa; and
- two projects, the Burnstone project (development) and the Southern Free State (SOFS) project (exploration) that are projected to add significant new capacity for production.

The basic product of Sibanye-Stillwater mining and processing operations in South Africa is a beneficiated ore, which is a rough product poured into bars that contains gold as well as other metals and byproducts. This is further refined at the Rand Refinery, one of the world's largest, which is 44 percent owned by the company.

The history of gold mining in the Witwatersrand is centuries old, and in some cases mining production at some Sibanye-Stillwater facilities dates back to the 1960s. Some of the mining sites also contain reserves of uranium.

Gold has always had appeal as a source of beauty and wealth. There is evidence of gold mining and refining that stretches as far back as 6,000 to 7,000 years ago. Its malleability and resistance to corrosion had made it a highly prized material for making jewelry, often mixed with other metals to provide greater strength. In more recent years, it has found many new uses in electronics, medicine, and technology products of all kinds.

Assessing the Economic Contributions of Sibanye-Stillwater Gold Operations in South Africa

Our approach to measuring the contribution of Sibanye-Stillwater gold operations to the national economy is to imagine an economy without them. This is a purely hypothetical scenario – no shutdown scenario is considered. The "no gold" economy that we construct in this analysis portrays an economy in which gold operations never existed. This is a thought exercise that is conducted for a simple purpose – to assess what gold operations ultimately add to the economy. This is accomplished by comparing – in terms of economic outcomes like employment, income, and production – the "no gold" economy to the actual economy.

It is clear that this difference – the jobs, spending, wages, and tax revenues – that would be lost to the economy had gold operations never taken place are more than simply the jobs and wages at the mining facilities themselves. Because the workers, vendors, and governments who receive the wages and revenues from Sibanye-Stillwater as income spend a portion within the economy, it is received by others as income, supporting further changes in spending, jobs, and production. Through this process, the "no gold" economy comes to a new equilibrium, or resting point, at a lower activity level.

Since a "no gold" economy cannot be directly observed, it must be estimated with an economic model. The model used in this analysis is the well-regarded IMPLAN model using an input-output (I-O) framework that accounts for the interrelationships between 43 different industries across the national economy. All of the I-O tables come from the Organization for Economic Co-operation and Development (OECD) and include distinct transactions between industries, industry output, industry value-added, and final demand. All monetary values in the data are represented in U.S. dollars (USD).

The analysis is conducted in three steps.

First, we collect information on Sibanye-Stillwater gold operations for the most recent historically available year, 2023. This includes information on jobs, wages and benefits, vendor spending, operating revenues, tax payments, and social welfare spending. Broadly speaking, this data describes the economic flows that are generated by gold mining and processing.

The second step is to present this information to an economic model that will measure how the removal of these economic flows will impact other parts of the economy. These impacts are classified as direct (the mining itself), indirect (companies in the supply chain and their workers), and induced (all subsequent changes to the economy as direct and indirect impact propagate).

The third and final step is to compare the actual economy to the "no gold" economy that is estimated in the second step. This comparison reveals the economic contribution of Sibanye-Stillwater gold operations.

Sibanye-Stillwater Gold Operations in 2023

The combined production of all of the Sibanye-Stillwater gold facilities in 2023 was 810,584 ounces of gold, including the recovery of residue metal from the retreatment of tailings at the DRDGOLD operations, which operate the Ergo Mining and Far West Gold Recoveries operations.

In terms of US dollars, those operations produced $1.58 billion (USD) in gross revenues in 2023, of which $1.26 billion was derived from Sibanye-Stillwater operations. There was $364 million of outlays on capital expenditures, much of which was directed to the development project at Burnstone project, now 65 percent complete.

In 2023 employment averaged 27,934 at Sibanye-Stillwater gold mining and processing facilities, including contractors. Total compensation paid was $544.8 million (USD). Other spending included $1.7 million in vendor spending, $140.1 million in profits and production taxes, and $25.2 million in training and development.

Sibanye-Stillwater gold operations also underwrite a number of social support programs whose aim is to improve employment equity, local economic development, and initiatives for skills training, housing, and community infrastructure projects. This spending is part of the Social Labour Plans (SLP's) submitted by mining companies as part of their mining rights applications.

In 2023 there were 14 ongoing projects associated with the gold mining operations of Sibanye-Stillwater in Eastern Cape, Gauteng, and Free State Provinces. These included projects in agricultural development, education and skills development, environmental management, health care and social services, and public infrastructure. SLP spending on all projects together, including the five which were completed, totaled $1.4 million in 2023.

Additionally, the company conducts a wide variety of Corporate Social Responsibility (CSR) activities that address broad community needs. There were a number of initiatives funded and supported by Sibanye-Stillwater gold operations in 2023, addressing needs in early childhood development, youth development, social employment, support of vulnerable populations, wellness, environmental needs, housing, food security and employee volunteerism. CSR spending was $25.2 million in 2023.

In a "no-gold" national economy, none of these activities take place. Thus in the construction of this hypothetical economic scenario, we remove these economic flows from the South African economy, and use our economic model (IMPLAN) to assess the new, lower, level of economic activity that is the result.

In the case of the SLP and CSR programs, their associated spending unquestionably underestimates their economic contributions, since it is the outcome of these investments, not the spending, that is their intended purpose.

The Socio-Economic Contributions of Sibanye Stillwater Gold Operations in South Africa

The gold operations of Sibanye-Stillwater are a significant economic driver in the national economy. A comparison of the actual economy and a hypothetical, "no gold," economy in which those operations and their associated spending do not take place, reveals that:

- nearly 52,000 permanent, year-round jobs across a wide spectrum of industries in the broader economy;
- $857.8 million (USD) in annual, recurring, wages and benefits paid to workers;
- $2.8 billion (USD) in annual, recurring, economic output, measured as gross receipts of South African businesses and non-business organizations; and
- $362.1 million (USD) in annual taxes collected by governments from businesses and households across the economy,

owe their existence to the gold mining, processing, and refining operations of Sibanye-Stillwater. The fact that these contributions are sizable is perhaps not a surprise from a company with such a visible, tangible presence in the regional economy. Yet the significant difference in the size of the overall contributions in comparison to the direct contributions of the company's gold operations themselves is less apparent, but no less impactful.

The additional jobs, compensation, output and tax revenues in the national economy that are due to the presence of the company's gold mining, processing, and refining operations come about as additional contributions that occur as the company's own spending is received and re-spent, in part, throughout the economy.

An appreciation of this induced transmission of economic benefit can be seen by considering the aggregate contributions in greater detail.

Employment Contributions

The gold operations of Sibanye-Stillwater in South Africa are ultimately responsible for the existence of 51,996 jobs in the national economy. The distribution of these affected jobs by major industry, as shown in Table 12, reveals the broad scope of the company's contributions.

As might be expected, the industry with the most jobs supported by mining is the mining industry itself. Yet the fact that nearly half of the jobs in the national economy that owe their existence to the gold operations of Sibanye-Stillwater is evidence of the powerful impact the spending and operations of the company has on virtually every part of the national economy.

More than 3,800 jobs in wholesale and retail trade businesses, as well as roughly 1,300 jobs in accommodations and food, finance and real estate, and transportation industries come about because the spending of both Sibanye-Stillwater itself and its employees brings income to employers in these industries, supporting their own job creation. The more than 3,000

government jobs that are ultimately supported by gold operations come about, in part, because of the tax revenues collected from Sibanye-Stillwater itself, as well as from the workers and businesses' tax contributions from the expansions in businesses in industries listed in Table 12.

Table 12: Employment Impacts, Jobs

Industry	Impact
Accommodation and Food	1,305
Construction	478
Finance and Real Estate	1,321
Government	3,031
Information	389
Manufacturing	2,353
Mining	27,992
Professional and Technical Services	611
Other Services	329
Transportation	1,356
Wholesale/Retail	3,824
Other	9,007
Total	**51,996**

The "other" category shown in the table aggregates a number of individual industries. Within this classification, the largest job gains come from personal services to private households, agriculture, and administrative and support services. The last classification includes temporary help services.

Compensation Impacts

The breakdown of the total compensation impact of gold mining operations of Sibanye-Stillwater by industry shown in Table 13 also illustrates the spread of impacts to other sectors of the economy, with some important differences. A higher fraction of the total compensation impact comes from the mining industry itself because mining jobs pay higher than average. Other industries, such as professional and technical services, capture larger shares of compensation impacts for that same reason.

On the other hand, some industries with larger job impacts have lower wages and thus command a smaller share of total compensation impacts. Most notable among these is the Other composite industry category which contains a larger number of part time jobs.

These recurring, higher amounts of compensation received by South African households across the economy because of the gold mining and processing operations of Sibanye-Stillwater are both cause and effect of the spread of overall economic contributions to seemingly unrelated parts of the economy. With extra earnings of over a half billion dollars a year received by mining workers and their families, there are substantial spending resources for purchasing goods and services from other pieces of the economy. That spending, in turn, supports the additional jobs and compensation of those who work outside of mining.

Table 13: Compensation Impacts, $USD Millions

Industry	Impact
Accommodation and Food	5.2
Construction	2.4
Finance and Real Estate	38.8
Government	50.2
Information	8.9
Manufacturing	30.6
Mining	559.3
Professional and Technical Services	107.2
Other Services	3.0
Transportation	11.8
Wholesale and Retail Trade	13.1
Other	27.4
Total	**$857.8**

Economic Output Impacts

Another dimension of the socio-economic contributions of the gold operations of Sibanye-Stillwater to the national economy is the impact that mining's presence has on economic output, defined as gross receipts of business and non-business organizations. As a high value-added industry selling its product on the global market, output impacts are dominated by increases in the mining industry itself, as shown in Table 14. Yet the annual sales of goods and services enjoyed by other, non-mining industries because of Sibanye-Stillwater's gold mining operations are substantial.

These annual, recurring impacts on economic output are the other side of the compensation and spending impacts. Businesses the non-mining industries show in the Table are recipients of the additional spending in the economy that comes about from the company's gold operations. This is not just the spending of workers and households – it also includes the spending of other businesses who purchase intermediate goods and services from across the economy to accommodate their own needs.

Table 14: Economic Output Impacts, $USD Millions

Industry	Impact
Accommodation and Food	25.3
Construction	10.7
Finance and Real Estate	198.5
Government	89.8
Information	58.7
Manufacturing	249.9
Mining	1,718.6
Professional and Technical Services	256.2
Other Services	13.0
Transportation	35.0
Wholesale and Retail Trade	61.9
Other	89.6
Total	**$2,807.4**

Tax Impacts

The larger economy that comes about because of the presence of Sibanye-Stillwater's gold mining and processing operations creates a larger tax base that can contribute to the operations of government. Mining has a special role in the national tax base, and so the impacts of the company's gold operations on annual tax revenues are substantial, as shown in Table 15.

Table 15: Tax Impacts, $ USD Millions

Tax Category	Impact
Employee Compensation	5.3
Enterprises(Corporations)	137.4
Households	106.0
Other Taxes on Production less Subsidies	113.3
Total	**362.1**

The tax categories shown in the table are OECD classifications which contain a variety of South African taxes. Corporate profits tax are included in taxes on enterprises, which comprise the largest portion of the taxes paid to government that are due to the gold operations of Sibanye-Stillwater. The next largest category, Other Taxes on Production less Subsidies, include mining production taxes as well as the carbon tax.

The size of the tax impacts reflects not only the taxes paid directly by mining activities themselves, but also taxes paid throughout the economy that are induced and indirectly supported by the economic flows from mining activity.

Summary and Conclusion

This report presents the findings of an analysis of the socio-economic contributions of the gold operations of Sibanye-Stillwater in South Africa to the national economy. Using actual data and operating information from 2023, and an economic model of the South African economy that is designed and calibrated for this purpose, we were able to estimate how the economy would look in the absence of the company's substantial gold mining, processing, and refining operations in the country. A comparison of this carefully constructed, hypothetical, "no mining" economy to the actual economy reveals the ultimate contribution that Sibanye-Stillwater's gold operations make to jobs and prosperity in South Africa.

Based on this comparison, we find that the presence of Sibanye-Stillwater's gold operations add:

- almost 52,000 permanent, year-round, jobs in a wide variety of mining related, and non-mining related, industries;
- annual, recurring job compensation of $857.8 million USD that is received by workers and households that is available for spending in the broader economy;
- economic output of $2.8 billion (USD) to the national economy, reflecting not just mining output but gains in output of a wide spectrum of other industries as well; and
- annual tax contributions of $362.1 million (USD) to governments that greatly increase the capacity of the public sector to meet community needs.

While these contributions are large in their own right, there is more to what the gold operations of Sibanye-Stillwater add to the economy and to the broader communities in which they belong.

The company's Social Labor Plans (SLP's) represent a strong commitment to making an enduring social impact in communities. This is accomplished through its ongoing projects in support of schools, roads, agriculture, business development, and environmental improvements. The company is also strongly committed to making an impact to communities and individuals through its Corporate Social Responsibility initiatives that address immediate needs.

An economy without the value creation and the economic opportunities created by Sibanye-Stillwater gold operations is clearly a less prosperous place to live, work, and thrive, as this study demonstrates.

5. EU Operations

The diversification of global precious metal producer Sibanye-Stillwater into so-called green metals – materials necessary for battery production expected to power the transition to non-carbon emitting energy – has manifested itself with the acquisition and operation of facilities in France and Finland.

Ownership of the Sandouville hydrometallurgical nickel processing facility near Le Havre, France, gives the company an important presence in producing a product that is already in heavy use in producing alloys for stainless steel and thousands of industrial applications and products. It also is a basic component of Lithium-ion batteries that are expected to be in high demand in a green energy transition. Sibanye-Stillwater also is expanding its adjacent GalliCam project aimed at producing precursor Cathode Active Material that will have a direct connection to portions of the Sandouville refinery.

A second initiative is underway in Finland, where the company's acquisition of the Keliber lithium project has the aim of producing high-purity lithium from ore mined on site within an integrated facility. Still in development, the project is aimed at addressing expected high demand from battery manufacturers across Europe. Through a partnership with a state-owned Finnish company and a group of Finnish shareholders, the project kicked off the first phase of construction of the refinery in the spring of 2023.

Assessing the Socio-Economic Contributions of Sibanye-Stillwater EU Operations

Both of these operations are well positioned to produce significant benefits in the immediate future as demand for batteries and other power storage components expands in one of the world's largest markets. But their current operations already provide jobs and support economic livelihoods in their respective economies.

This report analyzes the economic contributions of each of these Sibanye-Stillwater facilities using a common approach. That is to imagine what the economies of their respective countries would look like if the facilities did not exist. Using actual operating data from calendar year 2023, and economic models of each country that have been constructed and calibrated specifically for this purpose, we can project the level of economic activity that would occur if the Sandouville nickel processing facility and the Keliber lithium project were not present in the French and Finnish economies, respectively. A comparison of this hypothetical, "no operations" economy to the actual economy yields estimates of the socio-economic contributions of Sibanye-Stillwater operations in these two EU countries.

It is well known that economic activity in a regional economy that serves export markets can result in economic gains that exceed what is added by the activity itself. The wages, vendor spending, tax payments, and other economic flows that are supported by the production and operations of the Sibanye-Stillwater operations in both the Sandouville and Keliber facilities are received as income and a portion is re-spent in the national economies of each. This "knock-on"

effect supports additional spending and jobs by the businesses who receive that spending. The final outcome is a higher level of economic activity in industries that are seemingly unrelated to the green metal operations of Sibanye-Stillwater.

The IMPLAN economic model that is used in this study captures those interactions, using an input-output approach that is well established in the regional economics literature. The country-level models used are based on Organization for Economic Co-operation and Development (OECD) data definitions, which disaggregate the respective economies into 43 different industrial categories. They include distinct transactions between industries, industry output, industry value-added, and final demand. All monetary values in the data are represented in U.S. dollars (USD).

Sandouville Operations Contributions

The Sandouville facilities currently include a hydrometallurgical nickel refinery with an annual production capacity of 12,000 tons of high-purity nickel metal, 4,000 tons of high-purity nickel salts and solutions and around 600 tons of cobalt chloride. A second initiative, currently in the pre-feasibility stage, would convert the facility to produce high quality nickel-bearing precursor Cathode Active Material (pCAM) to serve battery manufacturing throughout Europe.

The first step in assessing how the operations at Sandouville contribute to the national economy is to construct a scenario where the operations are absent. This is not a shutdown scenario – no steps are considered that would be associated with that process. Instead, it is a hypothetical economy in which the refinery and associated activity never existed. This is conducted by (a) assessing the scale of current operations, (b) subtracting the jobs, wages, spending and production from the economy within the analytical framework of an economic model, and (c) using the model to trace out and quantify how the rest of the economy responds to the loss in refinery operations.

Using the year 2023 as a baseline, Sibanye-Stillwater's operations and activities at both the Sandouville refinery and the GalliCam project were responsible for:

- 266 jobs classified as basic metal manufacturing in the IMPLAN model.
- $19.5 million (USD) in employee compensation.
- $65 million of vendor spending.
- $247 million in capital expenditures; and
- $164 million in total revenues.

The removal of these substantial economic flows from the national economy is felt by other sectors of the economy as well.

Comparing the actual French economy to this hypothetical, "no Sandouville," economy where the jobs, revenues and spending of the refinery and GalliCam project are not present, we find that Sibanye-Stillwater's investment and production activities ultimately support:

- 750 permanent, year-round jobs across a wide variety of industries and occupations.
- $45.3 million (USD) in employee compensation per year.
- $276.5 million in annual economic output; and
- $65.3 million in annual tax payments received by government.

These economic contributions include the refinery's own jobs, compensation, output, and tax payments, in addition to those that happen elsewhere that are induced by the operations of the facility. The fact that the overall contributions of Sibanye-Stillwater's production and investments are well in excess of its own economic footprint underscores the importance of the "knock on" effects throughout the economy that are fueled by the economic flows it generates.

Table 15: Employment Impacts, Jobs

Industry	Impact
Accommodation and Food	23
Construction	9
Finance and Real Estate	26
Government	55
Information	10
Manufacturing	327
Mining	7
Professional and Technical Services	44
Other Services	7
Transportation	36
Wholesale/Retail	86
Other	118
Total	**750**

More insight on the process through which nickel refining and processing brings about growth throughout the economy can be obtained by looking at contributions by major industry. The employment impact detail shown in Table 15 reveals that the industry with the highest number of jobs because of Sibanye-Stillwater's nickel operations is manufacturing, which is estimated to have 327 jobs today because of the company's operations. This includes Sandouville employment, as well as manufacturing jobs elsewhere in the economy that come about because of the facility's presence.

The impacts shown in the table extend to industries with no apparent connection to nickel refining and processing activities, including wholesale and retail trade, professional and technical services, and government. These jobs come about as the spending that is directly related to Sibanye-Stillwater operations is received by workers, vendors and governments as income and spent elsewhere in the economy.

Another perspective on this process comes from a more detailed examination of how Sibanye-Stillwater nickel operations support compensation that is received by workers in the national economy. As can be seen in Table 16, the contributions made by the company's operations across the economy by this measure are similarly broad.

Table 16: Compensation Impacts, $USD Millions

Industry	Impact
Accommodation and Food	0.6
Construction	0.4
Finance and Real Estate	1.9
Government	3.1
Information	0.9
Manufacturing	24.4
Mining	0.5
Professional and Technical Services	3.0
Other Services	0.4
Transportation	1.8
Wholesale and Retail Trade	3.6
Other	4.7
Total	**45.3**

The compensation impacts shown in the table are both cause and effect of Sibanye-Stillwater's presence in the national economy. The substantial wages earned by workers at Sandouville are, in part, spent on goods and services produced by the industries shown, supporting jobs and additional wages and compensation across the economy.

Those wages and jobs are ultimately supported by the growth in business overall. The impact of Sibanye-Stillwater nickel refining and processing operations on the gross revenues of businesses and non-business organizations across the economy, shown in Table 17, is what allows the job growth and wages to happen. The largest impact on these revenues, defined as economic output, occurs in the manufacturing sector, which includes Sibanye-Stillwater itself, as might be expected. But the table also makes clear that other segments of the economy, many with no direct connection to the company's own operations, enjoy higher sales levels from the company's presence in the economy.

Table 17: Output Impacts, $USD Millions

Industry	Impact
Accommodation and Food	2.0
Construction	1.6
Finance and Real Estate	15.1
Government	5.5
Information	3.4
Manufacturing	195.3
Mining	2.4
Professional and Technical Services	9.2
Other Services	0.8
Transportation	6.4
Wholesale and Retail Trade	11.7
Other	23.2
Total	**276.5**

The increased size of a French economy that includes Sibanye-Stillwater's nickel refining and processing activities near La Havre results in a larger tax base as well. The international-level IMPLAN model used in this analysis classifies tax impacts in OECD categories, as shown in Table 18. These categories encompass the broad array of central government, local government, and EU taxes levied on households and individuals.

Table 18: Tax Impacts, $ USD Millions

Tax Category	Impact
Employee Compensation	11.7
Enterprises(Corporations)	4.4
Households	5.3
Other Property Type Income	2.2
Other Taxes on Production less Subsidies	41.8
Total	**65.3**

The tax impacts of Sibnaye-Stillwater's nickel operations are another mechanism that propagates the wealth creation of the facilities to the rest of the economy, as public spending, public services and their associated jobs and wages are supported in part because of the presence of the company in the national economy.

Keliber Operations

Although the Keliber mining project on the Gulf of Bothnia in central Finland being conducted by Sibanye-Stillwater is a different kind of operation than the company's Sandouville facility in France, in at least two respects they are much alike. Both are bets on the future in serving the

needs of the EU marketplace for green metals that go into batteries and other non-carbon emitting energy components. Yet both are also important economic drivers today, employing workers, purchasing goods and services and producing products in ways that make important economic contributions to their respective national economies.

In the case of Keliber, the product of the project in the year 2023 that is the baseline for our analysis was internal to the company. This is subject to significant change in the immediate future as plans unfold to construct a lithium hydroxide refinery and to ramp up production and exploration of lithium from the adjacent mine to be processed. Operations in 2023 were focused on gathering approvals and permits, securing financing, and vetting the technical and economic feasibility of the investments.

In 2023, the project employed 71 workers, classified as mining support industry employment in the industry definitions used by IMPLAN. Total compensation was $6.4 million (USD).

Compared to a hypothetical Finnish economy where the project activities did not take place, we estimate that these Sibanye-Stillwater operations ultimately contributed:

- 174 additional jobs in a wide variety of industries.
- $12 million (USD) of wages and benefits paid to those workers annually.
- $44.8 million in additional (annual) economic output, defined as gross receipts received by business and non-business organizations; and
- $5.2 million in (annual) additional tax revenues contributed to governments.

These economic contributions come about because of the spending involved with the Keliber project, yet the gains in the economy are occurring in other industries as well. Table 19, 20, and 21 detail the industry gains in employment, employee compensation, and economic output broken down into major industry categories. They show that even as the largest gains come in the mining industry in which Keliber activities are themselves included, there is considerable additions to economic activity that occurs in unrelated industries as well.

Table 19: Employment Impacts, Jobs

Industry	Impact
Accommodation and Food	4
Construction	3
Finance and Real Estate	4
Government	11
Information	3
Manufacturing	16
Mining	77
Professional and Technical Services	17
Other Services	2
Transportation	8
Wholesale/Retail	13
Other	16
Total	**174**

Table 20: Compensation Impacts, $USD Millions

Industry	Impact
Accommodation and Food	0.1
Construction	0.1
Finance and Real Estate	0.3
Government	0.6
Information	0.2
Manufacturing	1.0
Mining	7.1
Professional and Technical Services	1.0
Other Services	0.1
Transportation	0.4
Wholesale and Retail Trade	0.6
Other	0.5
Total	**12.0**

Table 21: Output Impacts, $USD Millions

Industry	Impact
Accommodation and Food	0.4
Construction	0.6
Finance and Real Estate	3.6
Government	1.4
Information	0.8
Manufacturing	6.9
Mining	21.9
Professional and Technical Services	2.6
Other Services	0.2
Transportation	1.5
Wholesale and Retail Trade	2.0
Other	2.9
Total	**44.8**

Finally, we note that the increased economic activity that comes about as a result of the Keliber project being conducted by Sibanye-Stillwater results in a larger tax base, which in turn yields higher tax revenues to governments in Finland.

Summary and Conclusion

The EU operations of Sibanye-Stillwater represent an investment for the future – a future of significant new demands for materials for batteries and other components that will be needed to power transportation and energy needs in a green energy future. But the operations and expenditures rolling ahead for the company's Sandouville facilities in France and the Keliber project in Finland are making economic contributions today.

Based on their spending, production, employment, and tax payments in 2023, we find that the presence of the company's operations ultimately contributes:

- 750 jobs permanent, year-round jobs to the French economy, as well as an additional 174 jobs to the Finnish economy;
- $45.3 million (USD) and $12.0 million in annual employees' compensation to the economies of France and Finland, respectively;
- an increase in annual economic output of $276.5 million (USD) in France, together with an increase of $48.5 million in output in the Finnish economy; and
- annual tax receipts that are $65.3 million higher in France, and $5.2 million higher in Finland.

These findings underscore the importance of Sibanye-Stillwater's presence in the EU economy overall, and in France in Finland in particular, and bode well for its economic contributions to grow in the future.

6. US Platinum Group Metals Operations

Mining has been part of the culture and history of the western United States for more than a hundred years. As far back as 1883 prospectors found deposits of copper, nickel, and chromium at the site of what is now the Stillwater Mine in south central Montana, in the northwest part of the US. The nature and scale of the mining potential for the area changed significantly with the discovery of the J-M Reef at the site in 1974 by the Johns-Manville Corporation. What was to become the richest source of Platinum Group Metals (PGM) in the world was developed by a consortium of partners led by Manville, which built a refinery and commenced production in 1986. PGM's include six minerals: platinum, palladium, rhodium, ruthenium, osmium, and iridium

Key to the drive to invest and expand production of PGM's has been the widespread adoption of catalytic converters in internal combustion engines as a means of limiting their emissions of hydrocarbons, increasingly mandated by industrialized countries since the 1970's. Both platinum and palladium have been used for this purpose – it is estimated that about half of global demand for palladium is directed to the motor vehicle manufacturing sector. In addition to their traditional use in jewelry and as stores of economic value, PGM's have also found growing use in advanced manufacturing in electronic components, plastics, petrochemicals, and other technology applications.

Heavy demand has also spawned a large recycling industry. Last year roughly 1.2 million ounces of platinum, 2.2 million ounces of palladium, and 7.7 million ounces of rhodium were produced from recycled materials.

Sibanye-Stillwater US PGM Operations

Sibanye Gold Limited acquired the Stillwater Mining Company in 2017, and the merged companies were rebranded as Sibanye-Stillwater. At the time of the acquisition the facility was already in the midst of an expansion – the Stillwater East project to add capacity to the Stillwater Mine went into production that same year. Those and other investments have added to the production and the overall economic footprint of the facilities since the Manville partnership first started production in 1986.

In the year 2023, these facilities included:

- The Stillwater mine in Stillwater County, consisting of two principal mining sections: the Western section, which began production in 1986, and the Stillwater East section, which commenced production in 2023 and remains in the buildup phase;

- The East Boulder mine located to the west in Sweet Grass County, operating since 2002;

- The Hertzler tailings storage facility, located 11 km north of the Stillwater Mine, which receives via pipeline the 56 percent of all concentrator tailings that are not returned underground as backfill;

- The Columbus metallurgical complex, a smelting facility and base metal refinery located east of the mining sites in Columbus, Montana, processes the ore and also processes and recycles PGM's from spent, recycled catalytic converters.

Associated with the mining sites are ancillary buildings containing concentrators, workshops, warehouses, sand plants and water treatment facilities.

In 2023 the facilities together produced 427,272 ounces of palladium and platinum

One of the unique aspects of the Sibanye-Stillwater PGM operations in the US is the proactive, solutions-focused relationship that exists between the company and some of the parties who have historically scrutinized, and often opposed, mining-related development in the past. Codified in a document known as the Good Neighbor Agreement, a framework has been established for protecting the environment while respecting economic development. It was signed in 2000 by the Stillwater Mining Corporation and three local organizations: the Northern Plains Resource Council, the Stillwater Protective Association, and the Cottonwood Resource Council.

The agreement binds the company to adhere to higher standards than what are specified in federal and state regulatory requirements, and provides a vehicle for dispute resolution and stakeholder involvement.

Assessing the Socio-Economic Contributions of Sibanye-Stillwater US PGM Operations

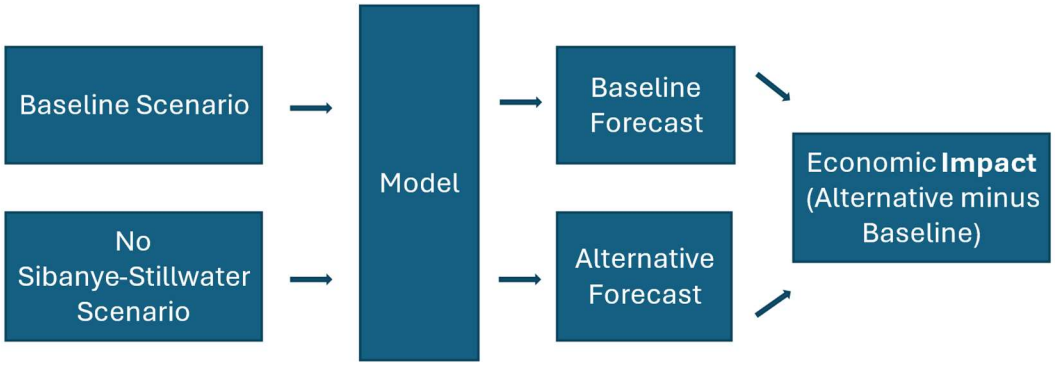
The approach of this study to measure the economic contribution of Sibanye-Stillwater's PGM operation to the US economy is to imagine what the economy would look like in their absence. This is not a shutdown scenario – no concrete steps that would be involved in an actual mine closure are contemplated or analyzed. Rather, this is a purely hypothetical exercise that contemplates an economy where the mine never existed, and the employment, spending, wages, taxes, and production are no longer present.

Such an economy would be smaller than what exists today, clearly. Yet the gap between the actual economy and what might occur in the absence of Sibanye-Stillwater's mining operations is significantly larger than the jobs, wages, spending, and other economic flows of the mining operations themselves. This is because those who receive as income the spending that PGM operations ultimately supports – the workers, vendors and suppliers, communities and governments – re-spend a substantial portion in the economy, supporting other production, jobs and spending.

Since the hypothetical, "no PGM operations" economy cannot be directly observed, it must be estimated using an economic model. The model used in this analysis is the well-established REMI policy analysis model that has been used in hundreds of published and peer-reviewed

studies. The model is based on an input-output framework that utilizes extensive data on transactions and production relationships between 70 different industries.

Figure 6: Policy Analysis



The approach to estimating the socio-economic contributions of Sibanye-Stillwater's PGM operations consists of three steps, as shown schematically in Figure 6. The first is to use operating data from the facilities to measure the employment, production, spending, wages, and tax payments of the mining complex. Then the model is used to project the performance of the broader economy when the economic flows that originate from the company's presence in the national economy are removed. Finally, we compare the "no PGM" economy that the result of this projection to the actual economy to obtain estimates of the economic impact of the mining, refining and recycling activities.

The year 2023 is used as the most complete period for actual operations that is available in the first step of this process. This is consistent with the companion analyses for Sibanye-Stillwater's other global operations that are part of this report. In the fall of 2024, however, depressed palladium prices caused the company to make the painful decision to partially curtail production – pausing production at the Stillwater West operation and cutting production by a third at the East Boulder mine. The result has been a reduction in work force of approximately 700 workers.

These changes are not included in this analysis, yet they clearly will affect the magnitude of economic contributions going forward. We will have additional comments on these events at the end of this report.

The Socio-Economic Contributions of Sibanye-Stillwater US PGM Operations

The operations of the Sibanye-Stillwater PGM mining complex in Montana are classified into two categories as they are represented in the REMI model. The mining activities that take place on the J-M Reef at the East Boulder and Stillwater (east and west) sites are classified as mining. The smelting, refining, and recycling activities at the Columbus Metallurgical Complex are classified as manufacturing (basic metals).

In 2023, primary PGM production was 427,272 ounces of palladium and platinum from the mine, and 310,314 ounces of palladium, platinum and rhodium from recycling. Gross receipts from this production were $1.3 billion (USD). Total employment averaged 1,855 for the year, with total compensation paid of $279.5 million (USD). Production-related taxes paid by the company to state and local governments was $22.3 million for the year.

All of these economic flows, in addition to the capital expenditures, vendor payments, community activities, and other taxes, would no longer be present in an economy where Sibanye-Stillwater's operations were no longer present.

Based on a comparison of this "no PGM" economy to the actual economy, we find that the Sibanye-Stillwater PGM mining, refining, and recycling operations in Montana ultimately support:

- 8,623 permanent, year-round jobs in industries and occupations across the entire economy;
- $687.9 million (USD) in annual employee compensation;
- more than $2.5 billion (USD) in annual economic output, defined as gross receipts of business and non-business organizations; and
- $65.3 million in annual tax revenues collected by governments as a result of the larger tax base.

These findings confirm that high value-added process of mining, processing, and refining PGM minerals in south central Montana is an engine of economic vitality and prosperity. This is particularly evident in the magnitude of Sibanye-Stillwater's economic contributions in relation to the mine's own employment and compensation payments.

To gain further insights into how these results came about, it is useful to examine them in greater detail.

Employment Impacts

The employment impacts of Sibanye-Stillwater's PGM operations in the US are spread widely among different industries, as shown in Table 22. The job impacts in the table reflect those from the mining, refining, and recycling operations as well as those induced throughout the economy as a result of the spending flows between industries shown. The largest job impacts are in mining, but it is clear from the table that other industries with no direct connection to mining have a significant number of jobs that are ultimately supported by the activities of the company. These include construction, accommodations and food, and government jobs.

These job increases in seemingly unrelated industries largely come about through the re-spending of income that is received by workers, businesses, and governments originating from the operations of the Sibanye-Stillwater mining complex. The size of these induced job impacts is evidence of the considerable spending flows that originate from the company's operations and propagate to the rest of the economy.

Table 22: Employment Impacts

Industry	Impact
Accommodation and Food	590
Construction	1,442
Finance and Real Estate	495
Government	913
Health Care	517
Information	19
Manufacturing	402
Mining	1,812
Professional and Technical Services	426
Other Services	355
Transportation	441
Wholesale/Retail	151
Other	1,061
Total	**8,623**

Compensation Impacts

The primary reason when Sibanye-Stillwater PGM operations propagate to other sectors of the economy is due to the spending that is fueled by those who receive wages or revenues from company activities. This fuels subsequent "knock on" effects as additional rounds of spending, income, and re-spending take place. An appreciation of the magnitude of these flows can be seen from the breakdown of employee compensation impacts by industry that are due to Sibanye-Stillwater PGM operations, shown in Table 23.

More than a quarter billion dollars (USD) in compensation is received by employees in the mining industry annually because of Sibanye-Stillwater's presence in the economy, with another

$48.3 million received by workers in manufacturing. These two industry classifications contain the workers whose compensation is directly supported by company production and revenues.

When those arrive in worker's households as income, they are partially re-spent in the domestic economy, leading to expansion in other industries to meet the demand, as well as hiring and wages paid. Additionally, the company's own spending on capital expansion, and vendor payments for goods and services, appear as income to those industries as well, kicking off the same process. We also note that the taxes paid by the company and by workers support the provision of government services of all kinds, expanding public employment and wages as shown in Table 22 and 23.

Table 23: Compensation Impacts, $USD Millions

Industry	Impact
Accommodation and Food	20.5
Construction	90.5
Finance and Real Estate	6.5
Government	69.9
Health Care	42.6
Information	1.7
Manufacturing	48.3
Mining	268.1
Professional and Technical Services	21.9
Other Services	10.3
Transportation	32.2
Wholesale and Retail Trade	10.1
Other	65.3
Total	**687.9**

Output impacts

Another dimension of Sibanye-Stillwater's economic contributions is the impact of its PGM operations on business revenue. Economic output, defined as gross receipts of business and non-business organizations, sees significant increases that are due to the presence of the company's mining, refining, and recycling operations in the economy.

As shown in Table 24, more than half of the overall $3.1 billion (USD) increase in output in the national economy comes from the manufacturing and mining categories, which contain the recycling and the mining operations of Sibanye-Stillwater, respectively. The size of this direct effect comes about because of the high value-added nature of the mining, refining, and recycling operations. Even in a year of much lower PGM (and especially palladium) prices, the value of output is high.

The output impacts noted in the table for the other industries shown are evidence of the strong spending that is ultimately supported by Sibanye-Stillwater PGM operations. The increase in gross receipts for businesses such as Accommodations and Food, Finance and Real Estate and

Construction that in most cases have little direct connection with PGM operations, speaks to the considerable size of the economic flows that show up as increases in demand for the products and services of these and other industries.

Table 24: Output Impacts, $USD Millions

Industry	Impact
Accommodation and Food	58.8
Construction	250.5
Finance and Real Estate	139.5
Government	137.5
Health Care	89.9
Information	8.7
Manufacturing	878.6
Mining	541.3
Professional and Technical Services	47.6
Other Services	31.1
Transportation	86.3
Wholesale and Retail Trade	37.8
Other	213.9
Total	**2,521.5**

Tax Impacts

Two factors are at play in understanding the impacts of Sibanye-Stillwater PGM operations on tax revenues in the national economy. The first is simply the increased size of an economy where the company's is included, compared to a hypothetical economy where it is not present. A larger economy produces a larger tax base, netting more revenue for governments at all levels.

A second factor at play is the fact that extraction industries generally, and PGM mining in particular, have an outsized impact on tax receipts. This is because of the special tax treatment of mining, particularly at the state and local government level in the US. Production related taxes that are not applicable to most other businesses are applied to mining, and thus its contribution in support of the public sector is proportionately larger than most.

Table 25: Tax Impacts, $ USD Millions

Tax Category	Impact
Employee Compensation	11.7
Enterprises(Corporations)	4.4
Households	5.3
Other Property Type Income	2.2
Other Taxes on Production less Subsidies	41.8
Total	**65.3**

The tax categories shown in the Table 25 are OECD classifications which contain a variety of US taxes. The tax impacts include not only taxes paid by Sibanye-Stillwater and its workers, but also all the taxes paid as a result of the larger economy that includes the company's PGM operations. The largest category of taxes, Other Taxes on Production less Subsidies, include mining production taxes directed to state and local governments. The size of the tax impacts reflects not only the taxes paid directly by mining activities themselves, but also taxes paid throughout the economy that are induced and indirectly supported by the economic flows from mining activity.

Summary and Conclusion

This report examines how the US operations of Sibanye-Stillwater in mining, processing, smelting, refining, and recycling PGM metals in south central Montana produce sizable benefits both to the national economy and the local community. The principal finding is that the PGM operations at the two mining operations, the Stillwater Mine (East and West) and the East Boulder Mine, together with the refining and recycling activities at the company's metallurgical complex in Columbus, Montana, are a powerful economic driver that supports jobs, wages, business revenues and tax receipts. We also note that the company continues to produce these economic benefits while maintaining a cooperative, solution-focused, and mutually respectful relationship with local and regional interest groups devoted to protection of the environment, as codified in its Good Neighbor Agreement.

Compared to a national economy where the PGM operations of Sibanye-Stillwater in south central Montana did not take place, we estimate that the presence of the company's operations ultimately are responsible for:

- more than 8,600 permanent, year-round jobs;
- $687.9 million (USD) in annual, recurring, wages and benefits receive by workers and their households;
- more than $2.5 billion in annual economic output; and
- $65.3 million in additional tax receipts that come about through growth in the tax base.

These outcomes leave little doubt that the presence of the company's operations are a fundamental driver of prosperity for thousands of businesses, people, and families.

Addendum: Curtailments of 2024

The preparation of this report coincided with the unwelcome news that the prolonged depression in global PGM markets – applying especially to palladium – had forced Sibanye-Stillwater to partially curtail its mining production at its Montana mining complex in the fall of 2024. The painful decision to pause production at the Stillwater West portal to its Stillwater Mine, and to cut production at its East Boulder Mine was estimated to cause a loss of 700 jobs. Since those jobs were present in 2023, which is the base year for the analysis reported here, this means that if the curtailments remained in effect for a full year, the size of the economic contributions would be smaller than what is presented here.

This outcome reinforces the message of this study. That is the importance of the mining, refining, and recycling operations to the economy and to the community. It could also be said that the expansion in Sibanye-Stillwater operations before this year, dating back to 2017, increased the size of its contributions as well. There is certainly concern going forward for how markets and profitability of the PGM business will evolve in the immediate future, and those concerns are especially heightened for the communities, businesses, and governments that have important connections to the operations described in this report. But there is little doubt that the economy has a big stake in this question as well.