Module: Introduction

Page: Introduction

CC0.1

Introduction
Please give a general description and introduction to your organization.

Gold Fields Limited is a globally diversified producer of gold with eight operating mines in Australia, Ghana, Peru and South Africa with attributable annual gold-equivalent production of approximately 2.2 million ounces. It has attributable gold Mineral Reserves of around 48 million ounces and gold Mineral Resources of around 101 million ounces. Attributable copper Mineral Reserves total 454 million pounds and Mineral Resources 5,813 million pounds. Gold Fields has a primary listing on the Johannesburg Stock Exchange (JSE) Limited, with secondary listings on the New York Stock Exchange (NYSE) and the Swiss Exchange (SWX).
Foreword by Nick Holland, CEO Gold Fields:
Gold Fields recognises that climate change is a challenge to society at large, our host communities and our operations. Our climate change programme is focused on the identification and assessment of climate change related risks as well as the development and implementation of action plans.
Gold Fields' objectives are to minimise our contribution to climate change and to build resilience to the physical impacts of climate change on our operations and surrounds. It is increasingly clear that the negative physical impacts of climate change are real and immediate, due to:

- The long-term risks posed by climate change to the Group's operations and surrounding communities;
- Increasing efforts to regulate carbon emissions in most of our jurisdiction; and
- Taxes increasingly imposed by governments on non-renewable energy consumption.

In response Gold Fields has designed and implemented an integrated strategy that seeks to reduce the company's carbon footprint and improve energy efficiency at our operations. Furthermore, we have published a climate change policy statement, which commits us to:

- Reporting on our greenhouse gas emissions and performance;
- Conducting climate change vulnerability and risk assessments;
- Investing in technology and innovation initiatives which minimise our emissions: and
- Promoting these principles to our suppliers and business partners.

Transparency around our emissions and efforts to mitigate our impact was the first step and Gold Fields has disclosed its carbon footprint to the CDP since 2007. As a result of the quality of our submissions Gold Fields has consistently been ranked as one of the JSE leaders in terms of disclosure and climate change leadership. Similarly, we publish all relevant climate change policy statements and guidelines on our website and publically support the climate change commitments of the International Council on Mining & Metals (ICMM).
In terms of practical steps that reduce our climate change footprint, Gold Fields is committed to having 20% renewable energy generation at all new projects over the life of these projects. We are close to giving the go-ahead to a 40 MW photovoltaic solar plant at our South Deep mine in South Africa. Further, last year we switched

to gas as the main power source at all our mines in Australia and Ghana, thereby further reducing our carbon footprint.
Gold Fields also supports global initiatives that co-ordinate efforts to reduce emissions and to understand climate change related risks. Gold Fields supported the development of and piloted a Mining Climate Assessment tool (MiCA) sponsored by the ICMM and signed the UN's Paris Agreement on climate change.
Climate change is one of the key risks faced by Gold Fields and its stakeholders. We would fail in our commitment to global leadership in sustainable gold mining if we did not proactively address and mitigate these risks.

CC0.2

Reporting Year

Please state the start and end date of the year for which you are reporting data.
The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.
We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.
Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed
Fri 01 Jan 2016 - Sat 31 Dec 2016

CC0.3

Country list configuration

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

Select country
Australia
South Africa
Ghana
Peru

CC0.4

Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

USD($)

CC0.6

Modules

As part of the request for information on behalf of investors, companies in the electric utility sector, companies in the automobile and auto component manufacturing sector, companies in the oil and gas sector, companies in the information and communications technology sector (ICT) and companies in the food, beverage and tobacco sector (FBT) should complete supplementary questions in addition to the core questionnaire.
If you are in these sector groupings, the corresponding sector modules will not appear among the options of question CC0.6 but will automatically appear in the ORS navigation bar when you save this page. If you want to query your classification, please email respond@cdp.net.
If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below in CC0.6.

Further Information

Module: Management

Page: CC1. Governance

CC1.1

Where is the highest level of direct responsibility for climate change within your organization?

Board or individual/sub-set of the Board or other committee appointed by the Board

CC1.1a

Please identify the position of the individual or name of the committee with this responsibility

(i) The highest level of direct responsibility for climate change within Gold Fields sits with the Safety, Health and Sustainable Development Committee. This Committee is a standing committee established by the Board with delegated authority from the Board.
(ii) The Committee is appointed by Gold Fields' Board of Directors and provides quarterly and annual reports on climate change risks, opportunities and recommendations to the Board for consideration. It is the responsibility of this Committee to assist the Board in its oversight of Gold Fields' socio-economic, environmental, health and safety programs, including climate change responsibilities. In particular, this includes the monitoring of Gold Fields' efforts to minimise its environmental footprint, including energy consumption and carbon emissions as well as social, health, safety and environment-related incidents and accidents. The Committee also ensures Gold Fields' compliance with relevant legislation and regulations around society, health, safety and the environment. Conformance with the principles of the International Council on Mining and Metals and the principles of the Global Compact is also evaluated by the Committee. All members of the Committee have been selected on the basis of their considerable experience in the field of sustainable development. The Committee's chairperson is an independent non-executive director, Terence Goodlace, and it consists of five independent non-executive directors. These directors, amongst others, monitor management's performance in regard to Gold Fields' policies and guidelines, as well as the implementation of any recommendations made by the Committee.

CC1.2

Do you provide incentives for the management of climate change issues, including the attainment of targets?

Yes

CC1.2a

Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Corporate executive team	Monetary reward	Emissions reduction target Energy reduction target Efficiency project	Gold Fields' Integrated Energy and Carbon Management Strategy integrates energy and carbon management into all aspects of the business. The strategy ensures energy security, improved management of energy costs, improved energy efficiencies and sustainable reduction of Gold Fields' carbon footprint. During 2016, Gold Fields' updated its Group Energy and Carbon Management Guideline to align with ISO 50001. The Guideline encourages a systematic approach to energy management through business optimization and continual improvement programs. Energy and carbon performance, with a strong focus on costs savings, and energy security – including the evaluation of renewable energy – were contained in the performance scorecards of senior and line management in 2016. In addition the Group 2016 and 2017 Performance Scorecard included energy cost management with a focus on upgrading energy efficiency plans.
Other: Executive vice president and vice president of group sustainability	Monetary reward	Other: Overseeing, managing and tracking the implementation and development of energy and carbon management structures and targets.	Incentivised carbon and climate change related activities include: • Overseeing the development of structures and capabilities in the regions for the delivery on energy and carbon management. • Ensuring regional progress on carbon emissions reduction target setting and obtaining an external review of the targets. • Tracking of progress against emissions reduction targets in the quarterly board sub-committee reports. • Developing and reporting on carbon and climate change related performance indicators. • Obtaining external assurance on key energy, carbon and climate change related performance indicators. Business as usual activities, which are required as part of annual remuneration (i.e. salary), related to incentivized climate change actions pertain to : • Communicating Gold Fields' support for climate change issues effectively in the public domain. • Drive the group goal of 20% renewable energy for all new projects.
Other: Sustainable development heads of the regions	Monetary reward	Other: Implement 2016 energy security plans and maintain energy and carbon baselines.	Energy and carbon performance, with a strong focus on cost savings and energy security – including the evaluation of renewable energy – were contained in the performance scorecards of senior and line regional management in 2016.
Other: Group Head of Energy and Carbon	Monetary reward	Other: Support and implement regional energy and carbon management strategy and action plan including managing regional energy & emission reduction targets and the baseline	Gold Fields has a permanent Group Head of Energy and Carbon. This position is at corporate level and further emphasizes Gold Fields' commitment to implementing operational change, across all the regions, in light of climate change. The Group Head of Energy and Carbon drives

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
		against which targets will be measured.	progress with regards to energy and carbon management, reduction and efficiency initiatives. Business as usual activities, which are required as part of annual remuneration (i.e. salary), related to incentivized climate change actions pertain to: • Ensure third party verification of the energy and emissions targets as well as the baselines. • Develop and implement five-year energy security plans. • Actual energy and emission reductions achieved and costs saved against the baseline.

Further Information

Page: CC2. Strategy

CC2.1

Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a

Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	The geographical areas considered in the risk management process are those countries where Gold Fields has operations. These currently consist of Australia, Ghana, Peru and South Africa.	> 6 years	Gold Fields conducts quarterly assessments on business risks which include climate change risks, at an operational and group level, which are reported to the Board. Business planning is influenced typically by the following risks: water scarcity, flooding, changing legislative landscapes pertaining to carbon management and the increasing need to find alternatives to traditional energy provision and improved energy efficiency.

CC2.1b

Please describe how your risk and opportunity identification processes are applied at both company and asset level

Gold Fields' Board Risk Committee evaluates risk assessments, including climate change related risk and ensures effective risk management policies are in place. The committee reviews insurance and other risk transfer arrangements, ensuring appropriate coverage is in place. The committee also reviews the business contingency planning process and provides quarterly-feedback to the Board. The Group Risk Manager is responsible for risk management at company level. Gold Fields' Enterprise Risk Management process is aligned with the ISO 31000 risk management standard. All risks identified have control measures & mitigating strategies in place.

Gold Fields uses a set of four well-defined processes to assess its risks, opportunities and material issues:
1. Key risks and mitigating actions are identified using an Enterprise-wide Risk Management (ERM) process as well as the risk management requirements of South Africa's King III and King IV governance codes. King IV has a principal dedicated to governing risk in a way that supports the organisation in setting and achieving its strategic objectives.
2. The Group takes into account the views and concerns of a wide range of stakeholders.
3. As part of the integrated reporting process, the Group conducts comprehensive interviews with key management and external stakeholders.
4. Material sustainability issues are assessed and prioritised according to the Global Reporting Initiative (GRI) G4 Guidelines.

Asset exposure to climate change related risks & opportunities is assessed through:
1. An ongoing physical risk management program which monitors risks, including climate change
2. Gold Fields' insurance company, annually
3. The group energy & carbon management guideline which requires risk assessments to be integral parts of all energy & carbon management plans & energy security plans.

CC2.1c

How do you prioritize the risks and opportunities identified?

Gold Fields carries out a formal process to assess and prioritise its material sustainability issues. The process uses criteria aligned with those set out in the GRI G4 Guidelines taking into account the actual or potential impact of these issues on Gold Fields and its stakeholders.

The process is based on a series of iterative assessments using a common, quantitative scoring framework. It draws on a range of internal and external sources, as well as detailed engagement with senior executives at the Company and representatives of external stakeholders – including industry, government, community and environmental organisations. These stakeholders were briefed on the GRI process and asked to evaluate all G4 aspects in terms of importance to Gold Fields and its stakeholders.

The process includes:
1. Compilation of Group Risk Register by the Group Risk Manager who extracts the top risks from the regional and operational registers, in line with the tolerance levels set by the Board
2. Exco risk meeting where top risks are reviewed and Group-wide mitigation strategies are set/ monitored, every six months
3. Risk and Audit Committee review of top risks and mitigation strategies undertaken twice a year

The outcome of this process, ranks health and safety, water management, environmental and compliance issues as the key GRI aspects that internal and external stakeholders consider most material to Gold Fields and its wider stakeholder base.

The probability of physical risks related to climate change is determined using information such as climate change projections and past experience. During 2016 and the beginning of 2017, climate change risk and vulnerability assessments were conducted for each of Gold Fields' operations. The probability of climate change regulatory risks is determined according to draft policies and Government response papers. The materiality of a risk is used to prioritize its management.

CC2.1d

Please explain why you do not have a process in place for assessing and managing risks and opportunities from climate change, and whether you plan to introduce such a process in future

Main reason for not having a process	Do you plan to introduce a process?	Comment

CC2.2

Is climate change integrated into your business strategy?

Yes

CC2.2a

Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process

i. Gold Fields' business strategy is influenced by the company's vision to become the global leader in sustainable gold mining. Energy and carbon management as well as emission reduction targets are integrated into the Gold Field's business strategy through the Integrated Energy and Carbon Management Strategy. Climate related information is also collected for the Group's integrated reporting process. The outputs of the Enterprise-wide Risk Management and stakeholder engagement processes are analysed alongside the information collected for the Integrated Annual Report. These include:

- Operational, financial and sustainability data generated through data management systems;
- Interviews with managers and executives at operation-, region- and Group-level;
- Short-, medium- and long-term strategic analysis of the external environment.

The collection and reporting of climate change data assist the company to ensure energy security; decrease carbon emissions; explore immediate and long-term energy efficiency opportunities and investigate renewable energy alternatives.

ii. Gold Fields' business strategy has been influenced through:

- Integrating energy and carbon management across operations and projects;
- Setting energy and emission reduction targets across operations to align with the Paris pledge;
- Investigating viable sources of alternative energy to reduce reliance on fossil fuel based energy;
- Implementing water reuse and recycling projects across operations to manage drought conditions;
- Developing heat stress and pit flooding strategies in response to heat waves and extreme rainfall events.

iii. Energy and water related factors are material to Gold Fields' future growth and therefore have considerable influence on the business strategy. The following are examples of climate change aspects that have influenced Gold Fields' strategy:

- A need to adapt due to increased operational costs and production disruptions as a result of changed weather patterns;
- Regulatory changes regarding energy reporting and carbon emissions in a range of jurisdictions as well as uncertain climate change regulatory requirements;
- Opportunities to develop green business including recognition of the strategic role of renewable energy within the group's energy mix;
- Reputational risk pertaining to Gold Fields' response to climate change. Recognising community impacts on the group's social license to operate and building resilience in host communities;
- The long-term risks posed by climate change to both operations and wider society.

Gold Fields anticipates that addressing climate change risks could realise potential opportunities, such as operational efficiencies and increased resilience of the host communities. The group's business strategy therefore integrates both the emissions and energy reduction targets as part of operational efficiency initiatives. The Group's revised emission reduction targets are also expected to reduce the potential exposure of the company to carbon taxes and other related regulatory initiatives.

iv. Gold Fields' short term strategy is influenced by climate change. Examples include:

- Regional emission reduction targets;
- Regional five-year energy security plans which include a Group commitment for 20% renewable energy for all new projects;
- Continued investigation into the feasibility of low carbon energy sources including:
  - Installation of solar power at Gold Fields' head offices in Johannesburg to meet half of the electricity demand;
  - South Deep 40MW solar PV project which is at feasibility phase;
  - Recently implemented Aggreko Gas Power Plant at the Granny Smith Mine as well as the Genser Power Plants at Tarkwa and Damang.
- Enhanced water management guidelines which focusses on reuse, recycling and conservation initiatives;
- Potential loss of social licence to operate remains a pressing issue at all of the group's mines;

v. Gold Fields' long term strategy is influenced by climate change. These include life of mine planning related to operational efficiencies applicable to energy, carbon and water management. These efforts are supported by clear guidelines related to applicable mitigation and adaptation actions which have been integrated into operational designs.

Another of Gold Fields' long term strategy focuses is the target that all new mining projects must utilise a minimum of 20% of renewable energy. For operating mines, the following long term strategic commitments are in place:

- Review replacing of carbon-intense sources of energy with renewable energy or switching to less carbon-intense energy sources (gas);
- Identify short, medium and long term energy efficiency or renewable energy initiatives that meet regional and operational internal rate of return requirements;
- Responsible water management with a focus on water stewardship.

Long term climate change strategies are also related to the Nationally Determined Contributions in the respective countries in which Gold Fields operates.

vi. Gold Fields joined the Paris Pledge for Action during 2015 which had a positive influence on the company's business strategy into 2016. By joining the pledge Gold Fields promised to ensure that the ambition set out by the Paris Agreement is met or exceeded to limit global temperature rise to less than 2 degrees Celsius. The Paris Pledge complements a statement made by the ICMM in October 2015, outlining the mining and metals industry's stand on climate change. As a result the business strategy encourages intensified efforts for improved energy and carbon management through a deeper understanding of energy drivers at mines to increased staff awareness and training.

vii. The incorporation of climate change into Gold Fields' short and long term strategies provides the Group with strategic advantage over its competitors. These advantages include:

- Reducing electricity and emissions intensity through a focus on renewable energy, efficiencies and environmental stewardship. This results in cost savings, energy security and prepares the Group for potential legislative changes;
- Identifying and optimising opportunities to re-use and conserve water at all operations;
- Strengthening 'social licenses to operate' through assisting community resilience which also provides a competitive advantage in the investment market.

viii. In 2016 and early 2017, Gold Fields' completed Climate Change Risk and Vulnerability Assessments across all operations. The assessments took into consideration both a 2 degree (RCP 2.6) and 6 degree (RCP 8.5) scenario. In this way Gold Fields makes use of forward-looking scenario analyses which informs the business strategy.

CC2.2b

Please explain why climate change is not integrated into your business strategy

CC2.2c

Does your company use an internal price on carbon?

Yes

CC2.2d

Please provide details and examples of how your company uses an internal price on carbon

Gold Fields' internal price of carbon is applied based on the regulatory carbon price that is set in the jurisdictions in which it operates. Two regions in which Gold Fields' operates currently have set carbon prices, namely South Africa and Chile.

In South Africa, the Draft Carbon Tax Bill sets a rate of R120 (US$ 9.46) per ton CO2 with tax free exemptions ranging from 60% to 95%. The effective tax rate is therefore between R6 (US$ 0.47) and R48 (US$ 3.79) per ton CO2. At South Deep Mine in South Africa, when motivating for energy efficiency initiatives, the carbon price of R48 (US$ 3.79) per ton CO2 is factored in to enhance the investment case.

CC2.3

Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)

Direct engagement with policy makers
Trade associations
Funding research organizations

CC2.3a

On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Carbon tax	Neutral	Gold Fields is engaging with respect to the Draft Carbon Tax Bill published in November 2015 in South Africa. Although Gold Fields' South African operations will be directly impacted by the carbon tax to a limited extent, they will be exposed to increased fuel prices, as fuel for mobile combustion will be taxed under the fuel tax regime. There is uncertainty as to whether Gold Fields' may be impacted directly by the carbon tax post 2020. Gold Fields is engaging on this legislation through its membership of the Chamber of Mines of South Africa and the Industry Task Team on Climate Change (ITTCC). Gold Fields chaired the ITTCC in 2016/17	Gold Fields supports efforts to reduce carbon emissions in South Africa, but suggests that any taxation schemes serve to incentivise industry to invest in the adaptation of low carbon energy options and improved efficiency. Based on this Gold Fields remains neutral regarding the Draft Carbon Tax Bill in its current draft.
Cap and trade	Support	Gold Fields is engaging with respect to the Emissions Reduction Fund (ERF) legislation in Australia. The Emissions Reduction Fund assists with meeting Australia's emission reduction targets by incentivizing businesses to adopt emission reduction initiatives for which emission reduction credits can be issued. The Clean Energy Regulator will issue Australian Carbon Credit Units for emissions reductions from registered projects. Once credits have been issued they can be purchased by the Government through the Emissions Reduction Fund or sold to organizations that wish to offset their emissions. Gold Fields Australia was granted ERF credits following a blind auction in early 2016.	Gold Fields' supports the Emission Reduction Fund in Australia. During 2016, the Aggreko gas plant was commissioned to supply Granny Smith with electricity. Gold Fields' Australia successfully auctioned carbon emission credits to the Australian Government as the plant switches from diesel to a gas power source.

CC2.3b

Are you on the Board of any trade associations or provide funding beyond membership?

Yes

CC2.3c

Please enter the details of those trade associations that are likely to take a position on climate change legislation

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
International Council on Mining & Metals (ICMM)	Consistent	The ICMM recognizes that comprehensive and sustained global action is required to reduce the scale of human-induced climate change and to adapt to its impact. In 2009, the ICMM published a policy on climate change. This was superseded by the Principles for climate change policy design which were published in June 2011. In October 2015, the ICMM issued a statement on climate change addressed to the UN Framework Convention on Climate Change, offering support for an international climate change agreement. The ICMM supports: • An effective binding global agreement on climate change; • A price on carbon and other market mechanisms that drive reduction of GHG emissions and incentivise innovation; • Greater use of renewable energy and other cost-effective low-emission technologies. In addition the ICMM recognises the need to reduce emissions from the use of coal and supports approaches to accelerate the use of low-emission coal technologies as part of a measured transition to a lower-emissions energy mix. Continuous engagement with peers, governments and society is encouraged by the ICMM to share solutions and develop effective climate change policy. Gold Fields has representatives on the 'Communications', 'Health, Safety and Product Stewardship', 'Environmental Stewardship and Social Progress', 'Water' and the 'Climate Change' committees and working groups, and the CEO represents the company at the CEO Council of the ICMM.	Climate change may result in increased severe events (such as storms and floods) which will impact the stability of tailings storage facilities (TSFs). The ICMM initiated a global review of TSF standards and critical control processes across its member companies. Gold Fields' CEO Nick Holland is acting as the CEO sponsor for the review and Gold Fields also chairs the member company working-group. Gold Fields joined its ICMM peers in the signing of the Paris Pledge for Action following the COP 21 negotiations.
Carbon Policy and Energy Efficiency Reference Group (CPEERG) meeting hosted by The Chamber of Minerals and Energy of Western Australia	Consistent	In Australia, Gold Fields is part of the Carbon Policy and Energy Efficiency Reference Group (hosted by the Chamber of Minerals and Energy of Western Australia) which engages in monthly meetings on all carbon policy and energy efficiency matters (related to the minerals and energy sector of Western Australia). Depending on the	Gold Fields participate in the Carbon Policy and Energy Efficiency Reference Group meetings.

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		topic, an industry opinion is voiced and presented to Government. The CME's climate position has been to support a measured transition to a low-emissions global economy. This is centred on three policy pillars including a global agreements, a market based mechanism and a substantial investment in low emissions technology and abatement.	
Chamber of Mines of South Africa	Consistent	The Chamber of Mines of South Africa recognises that anthropogenic factors have contributed to climate change and that meaningful action is required at a global and local level. The Chamber of Mines is committed to support South Africa's international commitment to lowering its GHG emissions through the National Climate Change Response White Paper and the National Development Plan.	Gold Fields supports and endorses the Chamber of Mines of South Africa, the principal advocacy organisation for policy positions affecting employers in the mining industry. Gold Fields' CEO, Nick Holland, is a member of the Council.
Industry Task Team on Climate Change (ITTCC)	Consistent	The ITTCC is fully committed to a positive future for South Africa, defined by strong job growth, an attractive investment environment, equity and social cohesion, and climate resilience. The Task Team is committed to working with industry and business groups and government departments to ensure sustainable economic growth while transitioning to a low-carbon economy. The ITTCC comprises industry players who are energy and carbon intensive and contribute significantly to GDP and are committed to combating the effects of Climate Change while remaining viable businesses. With this in mind, the ITTCC has determined that its most effective role is to undertake technical work that will contribute to a robust fact base for South Africa on Climate Change – the current state, the future possibilities and the impacts of possible policy instruments.	Gold Fields chaired the ITTCC in 2016/17 and supports the position of the Task Team.

CC2.3d

Do you publicly disclose a list of all the research organizations that you fund?

Yes

CC2.3e

Please provide details of the other engagement activities that you undertake

CC2.3f

What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Gold Fields integrates energy and carbon management into all aspects of its business through its Integrated Energy and Carbon Management Strategy (IECMS). This strategy seeks to ensure energy security; decrease carbon emissions; explore immediate and long-term energy efficiency opportunities; and investigate viable sources of alternative energy. In 2016, Gold Fields updated its Group Energy and Carbon Management Guideline to align with ISO 50001. The purpose of this Guideline document is to ensure that Gold Fields' vision and climate change strategy is consistent across the different operations and geographical regions, while allowing for different focus areas and specific circumstances. Following the ICMM's climate change statement, Gold Fields communicated this position statement to its employees.

Any external engagement with key industry bodies and other key stakeholders must be consistent with Gold Fields' Strategy and Stakeholder Engagement Guidelines. Engagement is almost always undertaken by senior representatives who have a good understanding of the company's strategy. Stakeholder engagement, beyond the regular interaction with Gold Fields' shareholders and investors, is becoming an increasingly critical issue and the Board devotes a large amount of time to ensure that Gold Fields' management deals appropriately with the challenges, issues and concerns of the key stakeholders in our host governments who may influence policy.

CC2.3g

Please explain why you do not engage with policy makers

Further Information

Page: CC3. Targets and Initiatives

CC3.1

Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?

Absolute target
Renewable energy consumption and/or production target

CC3.1a

Please provide details of your absolute target

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
Abs1	Scope 2 (location-based)	62%	22%	2015	489525	2025	Yes, but this target has not been approved as science-based by the Science Based Targets initiative	Abs 1 is a medium term target for Gold Fields' South African operation South Deep, whose carbon emissions are predominately from electricity purchased (Scope 2). Although the South Deep mine is currently ramping up, Gold Fields is investigating potential for an on-site 40 MW solar PV project, to reduce grid electricity consumption, which is 95% coal generated. A target window of 10 years was set. This target was calculated based on the projected grid emission factor of South Africa in 2025. This projection uses the Policy Adjusted Scenario of South Africa's Integrated Resource Plan 2010 (IRP 2010). This national level medium term planning takes into consideration the Peak, Plateau and Decline (PPD) document on which the country's NDC is based. It projects the national grid emission factor to be reduced to 0.79 tCO2/MWh from the current (2016)

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
								1.00 tCO2/MWh. The target is an ambitious science-based target as it exceeds the 2.1% reduction requirement to stabilise temperature increases below 2 degrees. South Deep will from 2017 be implementing a revised Gold Fields' group energy and carbon management guideline, aligned with ISO 50001 that aims to systematically improve our energy efficiencies.
Abs2	Scope 1+2 (market-based)	28%	15%	2015	381758	2030	No, but we are reporting another target which is science-based	Abs 2 is a medium term target for Gold Fields' Ghanaian operations Tarkwa and Damang. The Ghana NDC sets a national reduction target of 15% by 2030. Gold Fields' has a long standing corporate policy of always being legally compliant and giving the necessary support to the host country of operations. This support relates to the implementation of national targets and objectives. In this regard Gold Fields' supports Ghana's long term climate change objectives and have therefore set an indicative target that matches the national ambitions as expressed in the NDC. This 15 year target has been framed in the context of Ghana's position as a developing country in the international community. Gold Fields has already executed a 40 MW gas power purchase agreement with in independent power producer and gas turbines were commissioned in 2016. Gold Fields is further investigating feasibility for renewable energy to further off-set its carbon emissions in line with government policy for renewable energy sources to be added to the national energy mix. Gold Fields' Ghanaian operations will from 2017 be implementing a revised Gold Fields' group energy and carbon management guideline, aligned with ISO 50001 that aims to systematically improve our energy efficiencies.
Abs3	Scope 1+2 (market-	6%	30%	2015	78662	2030	No, but we are reporting another	Abs 3 is a medium term target for Gold Fields' Peruvian operation Cerro Corona. The Peruvian NDC sets a

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
	based)						target which is science-based	national reduction target of 30% by 2030. Gold Fields' has a long standing corporate policy of always being legally compliant and giving the necessary support to the host country of operations. This support relates to the implementation of national targets and objectives. In this regard Gold Fields' supports Peru's long term climate change objectives and have therefore set an indicative target that matches the national ambitions as expressed in the NDC. This 15 year target has been framed in the context of Peru's position as a developing country in the international community. Gold Fields' Cero Corona has since 2017, will from 2017 be implementing a revised Gold Fields' group energy and carbon management guideline, aligned with ISO 50001 that aims to systematically improve our energy efficiencies.
Abs4	Scope 1+2 (market-based)	29%	28%	2015	382211	2030	No, but we are reporting another target which is science-based	Abs 4 is a medium term target for Gold Fields' Australian operations Darlot, St Ives, Granny Smith and Agnew. The Australian NDC sets a national reduction target of 26% to 28% below 2005 levels by 2030. Gold Fields' has a long standing corporate policy of always being legally compliant and giving the necessary support to the host country of operations. This support relates to the implementation of national targets and objectives. In this regard Gold Fields' supports Australia's long term climate change objectives and have therefore set an indicative target that matches the national ambitions as expressed in the NDC. Gold Fields' Australian operations will from 2017 be implementing a revised Gold Fields' group energy and carbon management guideline, aligned with ISO 50001 that aims to systematically improve our energy efficiencies.
Abs5	Scope 1+2	100%	62%	2015	1322614	2035	No, but we are	Abs 5 is a long term target for all of the existing

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
	(location-based)						reporting another target which is science-based	operating assets in the current Gold Fields' portfolio: South Deep, Tarkwa, Damang, Cerro Corona, Darlot, St Ives, Granny Smith and Agnew. The target was calculated on the basis of the remaining life-of-mines of the existing asset portfolio. This calculation takes into consideration the fact that given current known mineral reserves, all of the existing operations with the exception of South Deep will be decommissioned before 2035. Mine closure and post-closure plans are developed for each operation according to strict standards, in compliance with the various regulatory requirements. All Gold Fields operations will from 2017 be implementing a revised Gold Fields' group energy and carbon management guideline, aligned with ISO 50001 that aims to systematically improve our energy efficiencies. Gold Fields will in 2017, be developing their Group Scope 1 and 2 emissions reduction absolute 2020 targets towards their long term (2035) target. Each year, Gold Fields will establish annual Group and regional targets.

CC3.1b

Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment

CC3.1c

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment

CC3.1d

Please provide details of your renewable energy consumption and/or production target

ID	Energy types covered by target	Base year	Base year energy for energy type covered (MWh)	% renewable energy in base year	Target year	% renewable energy in target year	Comment
RE1	All energy	2012	0	0%	2025	20%	In support of reducing emissions and energy consumption, in 2012 Gold

ID	Energy types covered by target	Base year	Base year energy for energy type covered (MWh)	% renewable energy in base year	Target year	% renewable energy in target year	Comment
	consumed						Fields set a renewable energy usage commitment of 20% at all new projects. At the Salares Norte project in Chile, Gold Fields is actively seeking renewable energy sources as part of its ongoing pre-feasibility study deliverables.

CC3.1e

For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Abs1	10%	0%	In 2016, Gold Fields' South Deep operation Scope 2 emissions were 9% higher than 2015 base year emissions, as a result of higher electricity usage due to a 50% increase in ore milled and higher gold production, reducing emission intensity (tonnes Co2/tonne ore milled) by 28%, with some 740 tCO2e emissions reduced from the energy efficient fans retrofit programme.
Abs2	7%	0%	In 2016, Gold Fields' Ghanaian operations Scope 1 and 2 emissions remained relatively unchanged from base year emissions. Even though carbon emissions at Tarkwa mine increased due to increase in diesel usage; the increases were offset by impact of initiatives implemented (attributable reduction of 8068 tCO2e) and operational changes at Damang.
Abs3	7%	0%	In 2016, Gold Fields' Cerro Corona operation Scope 1 and 2 emissions remained relatively unchanged from base year emissions; with slightly lower production levels.
Abs4	7%	0%	In 2016, Gold Fields' Australian operations Scope 1 and 2 emissions increased by 4% from base year emissions, while the diesel to gas initiative at Granny Smith reduced emissions significantly, the reduction was off-set by the diesel usage increase at St Ives during the push back program, and initiatives reduced emissions by 12 496 tCO2e.
Abs5	5%	0%	While Gold Fields operations overall Scope 1 and 2 emission were on average 4% higher than base year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
			emissions due to an increase in both electricity and fuel usage; a number of new initiatives implemented in 2016 contributed to a reduction of 21304 tCO2e Scope 1 and 2 emissions, representing a 1.4% reduction against the 2016 reporting year emissions.
RE1	0%	0%	Gold Fields is unable to report progress on this target as the Salares Norte project is still at pre-feasibility stage and evaluations for renewable energy technology options is underway.

CC3.1f

Please explain (i) why you do not have a target; and (ii) forecast how your emissions will change over the next five years

CC3.2

Do you classify any of your existing goods and/or services as low carbon products or do they enable a third party to avoid GHG emissions?

Yes

CC3.2a

Please provide details of your products and/or services that you classify as low carbon products or that enable a third party to avoid GHG emissions

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Product	As well as gold, Gold Fields produces copper (31 000 tonnes in 2016) at the Cerro Corona mine in Peru. Copper is a highly efficient conductor which is used in electric vehicles and renewable energy systems to transmit power from solar, hydro, thermal and wind energy. Using more copper in the wiring reduces thermal resistive losses and assists in reducing emissions as it lowers the amount of energy needed to generate a single electricity unit. Therefore Gold Fields' copper product assists third parties in avoiding emissions.	Avoided emissions	Other: Gold Fields does not currently calculate the avoided emissions associated with copper.			

CC3.3

Did you have emissions reduction initiatives that were active within the reporting year (this can include those in the planning and/or implementation phases)

Yes

CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	6	

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
To be implemented*	7	5126
Implementation commenced*	2	21218
Implemented*	7	21304
Not to be implemented	1	

CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	Gold Fields' Australian operation, Agnew installed a power line to replace diesel power generators.	3748	Scope 1	Voluntary	1120000	1500000	<1 year	11-15 years	
Low carbon energy installation	Gold Fields' Australian operation, Granny Smith converted a 24 MW gas fired power plant to gas	8748	Scope 1	Voluntary	120000	3375000	4-10 years	11-15 years	The independent power producer invested $23 million and $3.37 million by. Gold Fields Australia. The power plant life will be to the life of mine (14 years).

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
									Realized financial savings depend on the prevailing oil prices, in 2017 savings are expected to be higher than 2016 due to higher average oil prices.
Energy efficiency: Processes	Gold Fields' Ghana operation, Tarkwa retrofitted old sodium vapor lamps lighting fixtures with LED lights for street lights, high masts, perimeter lights and buildings	303	Scope 2 (market-based)	Voluntary	80259	832409	<1 year	Ongoing	
Energy efficiency: Processes	Gold Fields' Ghana operation, Tarkwa ECO Driver Training for efficient operations of the machines	1399	Scope 1	Voluntary	470242	4528	<1 year	Ongoing	
Energy efficiency: Processes	Gold Fields' Ghana operation, Tarkwa commissioned a crushing circuit optimization initiative to provide operational flexibility and improve crushing energy efficiency	871	Scope 2 (market-based)	Voluntary	236053	0	<1 year	11-15 years	Only the labour cost formed part of the investment required.
Energy efficiency: Processes	Gold Fields' Ghana operation, Damang upgraded the carbon	5495	Scope 2 (market-based)	Voluntary	1634442	2436164	1-3 years	11-15 years	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	in leach plant to enable water pumps efficient flow rates								
Energy efficiency: Processes	Gold Fields' South Africa operation, South Deep, installed energy efficient jet fans	740	Scope 2 (location-based)	Voluntary	41596	76143	1-3 years	11-15 years	South Deep has life of mine well beyond 15 years.

CC3.3c

What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated budget for energy efficiency	Gold Fields regions include process optimization and cost savings initiatives in their business plans, and these are budgeted for.
Dedicated budget for other emissions reduction activities	In recognition of opportunities for fuel switching from diesel to gas or grid electricity, initiatives that result in emission reductions, not necessarily energy usage reductions, are routinely investigated and implemented.
Financial optimization calculations	In order to assess viability of energy initiatives, detailed calculations of cost savings are conducted and initiatives with a payback period of less than 2 years get immediate support.
Employee engagement	As part of the integrated energy and carbon management strategy implementation guideline, Gold Fields employees are encouraged to submit energy use and cost management ideas and initiatives and are recognized for these. Gold Fields revised its integrated energy and carbon management guideline in 2016 to align with ISO 50001. In which a critical component of the guideline is

Method	Comment
	employee engagement and communication, with an aim to influence behaviour. Whilst, training, awareness raising and change management are recognized as significant pillars of influencing behaviour; the quantifiable impact of the effort is indirect and measured through implemented initiatives.
Other	Gold Fields includes energy and carbon emissions performance in key personnel's performance indicators. Improved performance for energy and carbon is measured and rewarded through an incentive scheme for executives and managers.
Other	A combination of cost abatement through replacement of grid electricity with low carbon alternatives together with dedicated budgets for energy efficiency and carbon emissions reduction initiatives.

CC3.3d

If you do not have any emissions reduction initiatives, please explain why not

Further Information

Page: CC4. Communication

CC4.1

Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s)

Publication	Status	Page/Section reference	Attach the document	Comment
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Gold Fields' Integrated Annual Report for the year ended 31 December 2016 Pages: 12, 15, 19, 21, 23, 25, 28, 78 – 83, 86 - 87, 123, 126.	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC4.1/iar-2016 (1).pdf	

Publication	Status	Page/Section reference	Attach the document	Comment
In other regulatory filings	Complete	SEC Form 20 F. Pages: 27 - 28, 44, 50, 102, 110 - 111, 117, 120, 134 – 140.	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC4.1/form-20f-2017.pdf	
In voluntary communications	Complete	Presentation at the Energy and Mines World Congress. Pages: whole document.	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC4.1/Energy and mines wold congress presentation.pdf	
In voluntary communications	Complete	Interview at the Energy and Mines World Congress. Pages: whole document.	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC4.1/EMWC-2016-Interview-GoldFields-web-7.pdf	
In voluntary communications	Complete	Gold Fields' Connect Group Communication Edition 1 2016 Page 3, 8 – 9	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC4.1/connect-2016-the-year-of-opportunity Ed 1.pdf	
In voluntary communications	Complete	Gold Fields' Connect Group Communication Edition 2 2016 Page 10	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC4.1/connect-2016-keeping-the-focus Ed 2.pdf	
In voluntary communications	Complete	Future of Mining Conference The Gold Mining Company of the Future Nick Holland 120th Anniversary Wits Mining School – 23 March 2017 Page 2 -4	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC4.1/Wits 2.pdf	

Further Information

Module: Risks and Opportunities

Page: CC5. Climate Change Risks

CC5.1

Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Risks driven by changes in regulation
Risks driven by changes in physical climate parameters
Risks driven by changes in other climate-related developments

CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Carbon taxes	In South Africa, a carbon tax of R120 per ton CO2e has been proposed for introduction at the beginning of 2018. The initial Carbon Tax Policy Paper outlined the proposed carbon tax and was subsequently updated in November 2015 through the publication of the Draft Carbon Tax Bill. There is a 60% tax free threshold, as well as additional allowances such as carbon offsets and trade exposure. Taking the additional	Increased operational cost	Up to 1 year	Direct	Likely	Low-medium	It is estimated that the price of diesel and petrol may increase by R0.12/litre. This may increase South Deep's fuel costs by US$ 24 000.	Gold Fields is managing the risk of carbon tax in three ways: 1. Gold Fields engages with Government on carbon tax related issues through its membership of the Chamber of Mines and the Industry Task Team on Climate Change (ITTCC). 2. In 2016, Gold Fields updated its Group Energy and Carbon Management Guideline to align with ISO 50001. Each region supported and	These costs are best expressed via the company's 2016 membership fees associated with the Chamber of Mines engagement: US$ 135 711 (the fee is not exclusively for climate change activities) and the ITTCC (part of the Energy Intensive Users Group): US$ 11 224. The financial implication of keeping the internal emission reporting system

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	allowances into account, the carbon tax rate may vary between R6 – R48 per ton CO2e. Under the current tax design Gold Fields faces two risks due to the South African carbon tax: 1. Fuel for mobile combustion will be taxed under the fuel tax regime, and it is anticipated that fuel levies will be increased. Gold Fields may therefore be exposed to an increase in fuel prices. 2. The electricity price may be impacted, though the government is on record as saying that this will not be the case. The impact of the carbon tax on Gold Fields is becoming certain up to 2020. However the long term impact of carbon tax on operating costs after 2020 is unknown.							implemented the Group Energy and Carbon Management Guideline by developing regional energy and emission reduction targets. Gold Fields is investigating setting short-term operational targets for energy use, cost and carbon emissions for 2017 against annual energy and production plans. They will consider absolute GJ, energy cost (US$) and absolute carbon emissions (tonnes CO2e) avoided, based on planned and feasible initiatives. 3. Gold Fields' carbon footprint is reduced through behavioural changes, energy efficiency projects and through the	up to date is estimated to amount to an annual internal cost of approximately US$ 20,000.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	This is specifically relevant because South Deep has a relatively high emission factor per ounce of gold relative to open cast mines. However compared to other underground mines South Deep's emission factor per ounce of gold lower.							implementation of renewable and alternative energy projects. South Deep has appointed an independent power producer to develop, build, own and operate a 40 MW photovoltaic (PV) plant. The plant is expected to generate 100GWh/year. This is equivalent to 20% of South Deep's annual 500GWh electricity consumption. The project would avoid carbon emissions estimated at 100,000tCO2e per annum.	
Uncertainty surrounding new regulation	In line with South Africa's vision of moving towards a low carbon economy, several South African Government	Increased operational cost	1 to 3 years	Direct	More likely than not	Low-medium	The financial impact might be related to an increase in reporting costs, increased operational costs	This risk is managed by engaging on a regular basis with Government to communicate the impact of such	These costs are best expressed via the company's 2016 membership fees associated with the Chamber of

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	regulations have been drafted in relation to emissions/energy reporting and associated reductions: • The Department of Environmental Affairs is currently developing proposed content for a climate change response legal framework. The proposed content talks to sectoral emission targets, carbon budgets and a national GHG emission reduction trajectory. Carbon budgets have already been put in place for some industries on a non-binding basis. Carbon budgets will be applied to gold mining post 2020. • The Department of Environmental Affairs published the Draft Declaration of Greenhouse Gases as Priority Pollutants						due to the management of emission reduction targets and reduced growth possibilities. In addition the regulations specify that a penalty between US$ 394 322 – US$ 788 644 may be imposed if a company fails to comply with the Pollution Prevention Plan Regulations.	regulations on the mining sector. Gold Fields engages on such topics with Government in South Africa via the Chamber of Mines and the Industry Task Team on Climate Change. This management method could potentially decrease the magnitude of the risk over the next year.	Mines engagement: US$ 135 711 (the fee is not exclusively for climate change activities) and the ITTCC/Energy Intensive Users Group: US$ 11 224.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	in conjunction with the Draft Pollution Prevention Plans regulations at the beginning of 2016. These regulations provide a list of production processes required to report pollution prevention plans. Currently gold mining is excluded from the first phase of reporting. However there is the risk that the list of production processes will be re-examined to include gold mining in the future. • The Department of Energy published the Draft Regulations Regarding Registration, Reporting on Energy Management and Submission of Energy Management Plans during 2015. The regulations stipulate that if annual energy								

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	consumption is above 180 TJ, companies may be required to measure and collect energy consumption data to be submitted to the Department. In addition, if energy consumption is above 400 TJ, companies may be required to submit an energy management plan. It is expected that Gold Fields' South African operation, South Deep will be required to report energy consumption data and submit an energy management plan, as its annual energy consumption is above 400 TJ. The National GHG Emission Reporting Regulations were published on 3 April 2017. There does however remain uncertainty around the reporting framework and requirements which								

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	have yet to be finalised. The risks associated with the above mentioned regulations are multiple: • Costly and time consuming reporting of data is probable. • Due to the fact that some of the above mentioned regulations are still in draft stages, much uncertainty remains. • Increased operational costs due to the management of energy and emission reduction targets.								
Uncertainty surrounding new regulation	Australia's Emission Reduction Fund has brought in the Direct Action Plan (DAP), which will serve as the nation's primary climate change policy. The objective of the Emissions Reduction Fund is to assist with meeting Australia's emission reduction target of	Increased operational cost	1 to 3 years	Direct	Likely	Low-medium	The Clean Energy Regulator has access to a range of graduated enforcement options to encourage operators to comply with their safeguard obligations.	The mechanism has a number of options available to manage the excess emissions: 1. Applying for a calculated baseline or variation to the baseline; 2. Surrendering Australian carbon credit units	Membership fee of the Chamber of Minerals and Energy of Western Australia was approximately US$ 143 363 in 2016. (The fee is not exclusively for climate change activities).

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	5% below 2000 levels by 2020. The Emission Reduction Fund incentivises businesses to adopt initiatives to reduce emissions by purchasing these emissions reductions. The DAP on climate change implemented the Safe Guarding Mechanism in July 2016. The mechanism will apply to around 140 large businesses that have facilities with direct emissions of more than 100 000 tCO2e a year. It is designed to ensure that large emitters do not exceed their baseline emissions. Companies exceeding their baselines will be penalised. Gold Fields' St Ives operation have been set a baseline of 100 000 tCO2e under the mechanism. The						However. if companies do not comply with the safeguard obligations, then the Clean Energy Regulator may seek civil penalties through the courts with the maximum amount set at AUS$ 18 000 per day. In addition to paying the penalty, the facility operator remains under an obligation to rectify an excess emissions situation. The civil penalty is designed to encourage compliance, not raise revenue. It is a last resort and will never apply to businesses that meet legislated safeguard requirements.	(ACCUs) to offset emissions and bring net emissions below the baseline; 3. Applying for a multi-year monitoring period to allow additional time to reduce emissions; or 4. Applying for an exemption where emissions are due to exceptional circumstances such as a natural disaster or criminal activity. For St Ives, option 3 may be more relevant, if it exceeds its baseline. The life of mine forecast suggests that 2016 and 2017 will have high diesel consumption years due to the number of open pit operations. This risk is also managed through government	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	first reporting period runs from July 2016 to June 2017. There is a risk that St Ives' direct emissions may exceed this baseline. In the event that this baseline is exceeded a penalty may be incurred.							engagement and emission reduction strategies. Government engagement is conducted via the Chamber of Minerals & Energy of Western Australia. The Chamber hosts the Carbon Policy and Energy Efficiency Reference Group (CPEERG) where Gold Fields can discuss carbon policy and energy efficiency matters. Gold Fields integrates energy and carbon management into all aspects of its business through its Integrated Energy and Carbon Management Strategy. This strategy seeks to ensure energy security; decrease carbon emissions;	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								explore immediate and long-term energy efficiency opportunities, and investigate and implement viable sources of renewable energy.	
Renewable energy regulation	Ghana passed the Renewable Energy Act 832 in 2011. It makes provision for the development, management, utilisation, sustainability and adequate supply of renewable energy for heat and power generation. It aims to provide an incentive for businesses to invest in renewable energy projects to help the country achieve 10% renewable energy production by 2020. The Act gives rise to a number of key provisions two of which may have an impact on Tarkwa and Damang Mines.	Increased operational cost	1 to 3 years	Direct	Very likely	Low-medium	Tarkwa's agreed tariff with Genser Energy from January 2018 will be US$ 0.10/kWh. The first phase of the feed in tariff prices range from US$ 0.15/kWh for solar PV to US$ 0.16/kWh for wind. Investing in renewable energy would therefore cost Gold Fields approximately 37% more than the current agreed tariff with Genser Energy.	Gold Fields is managing this risk two ways: 1. The Group Energy and Carbon Management Guideline was updated during 2016 to align with ISO 50001. Each region supported and implemented the Group Energy and Carbon Management Guideline by developing regional energy and emission reduction targets. Gold Fields is investigating setting short-term operational targets for energy use, cost and carbon emissions	The investment required for the two energy efficiency projects was US$ 2.4 million.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	The first being the feed-in tariff which provides a guaranteed price for electricity generated from renewable energy. However initial prices published by the Government are more expensive than the current agreed tariff that Gold Fields has with Genser Energy. In addition the act makes provision for a renewable energy purchase obligation, which requires bulk electricity consumers to procure a certain proportion of purchased electricity from renewable energy sources. However uncertainty remains as the Government has yet to publish the proportion of renewable energy required or the associated penalties relating to non-							for 2017 against annual energy and production plans. They will consider absolute GJ, energy cost (US$) and absolute carbon emissions (tonnes CO2eq) avoided, based on planned and feasible initiatives. 2. Actively reducing the Group carbon footprint through behavioural changes, energy efficiency projects and through the implementation of renewable and alternative energy projects. During 2016 Gold Fields' Ghana implemented two energy efficiency projects focused on upgrading the Tarkwa Crushing Circuit and the Damang Carbon in Leach Plant.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	compliance. Gold Fields is a bulk electricity consumer and it is likely that it will be affected by the renewable energy purchase obligation. However, the premiums for not meeting the obligations are still uncertain. While the Act's framework, applications and guidance are still being established the policy is gaining traction and the successes and challenges have been reported by the Ghanaian Ministry of Power in August 2016. The risk for Gold Fields is in the uncertainty of the regulations which may impact on long term energy costs and planning.								
Uncertainty surrounding new regulation	While hosting the Twentieth Conference of the Parties of the United Nations Framework	Increased operational cost	1 to 3 years	Direct	Likely	Low-medium	The financial impact might be related to an increase in reporting costs,	This risk is managed by engaging on a regular basis with Government to	Gold Fields' membership fee associated with the Peruvian National Mining,

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Convention on Climate Change (UNFCCC COP20) negotiations in December 2014, Peru passed a climate law – the first of its kind in the region. The law established a greenhouse gas inventory system known as INFOCARBONO. INFOCARBONO is a legal framework that establishes the mechanisms and institutional arrangements needed to prepare national greenhouse gas inventories. There is a risk that Cerro Corona will have to report GHG emissions to the relevant ministries in the future. The Peru National Framework for Climate Change is currently under development. The framework will be used by						increased operational costs due to the management of emission reduction targets and reduced growth possibilities.	communicate the impact of such regulations on the mining sector. Gold Fields is a member of the Peruvian National Mining, Petroleum and Energy Society through which Government engagement is managed. In addition, during 2016, Gold Fields worked with the ICMM to pilot the Mining Climate Assessment (MiCA) tool that gives insight into physical changes in precipitation, temperature, wind and water stress levels from 2025 to 2045. This tool enables ICMM members to assess their operations' vulnerability to climate change using a common tool. The risk	Petroleum and Energy Society was US$ 88 026 during 2016. The climate risk assessment for the Peru operations cost approximately US$ 44 000.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Government to implement future mitigation and adaptation plans, which could pose a risk to how Cerro Corona manages climate change issues.							assessments covered the entire mine life cycle, including post-closure. Using this tool a detailed risk assessment was conducted for the Peru operations. An operational adaptation plan is also being developed to ensure operational resilience.	

CC5.1b

Please describe your inherent risks that are driven by changes in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	The International Council on Mining and Metals (ICMM)	Reduction/disruption in production capacity	Up to 1 year	Direct	Likely	Medium-high	The financial implication estimated for the potential precipitation	These risks are managed through: • periodic risk assessments, •	During 2016, Gold Fields spent a total of US$16m on water

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	has identified a number of risks relating to mining operations due to changes in precipitation extremes and droughts as forecast in the IPCC Fifth Assessment Report. The extent and frequency of drought conditions may exacerbate water scarcity in water stressed areas. Water is critical to many processes in mining and metals operations and as such changes in availability or quality will have implications for production, efficiency and cost. The remote Cerro Corona and water scarce						extreme and drought impacts is based on operational disruptions. Operational disruptions can result in a loss in revenue. During 2016 Gold Fields' operations at South Deep experienced stoppages of three reverse osmosis plants due to water shortages. The plants were not operational for several months which increased South Deep's water purchase costs by approximately US$ 120 000.	use of Environmental Management Systems, • predictive water balances for current and future water requirements, • a Group Water Management Guideline, • rainwater harvesting, • storm water management, and • Water re-use, recycling and conservation initiatives. In addition, during 2016, Gold Fields worked with the ICMM to pilot the Mining Climate Assessment (MiCA) tool that gives insight into physical changes in precipitation, temperature, wind and water stress levels from 2025 to 2045. This tool enables ICMM	management and projects

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	South Deep operations may be particularly susceptible to the risks of drought. In 2016 drought conditions caused a mine water shortage in South Deep, which resulted in two of the three reverse osmosis plants being shut down. The Ghana Volta River Authority generates a significant amount of power from hydro power schemes. During 2016 the Authority was challenged in meeting the high peak demand due to particularly low water levels in the reservoir at Akosombo as well as fuel supply							members to assess their operations' vulnerability to climate change using a common tool. The risk assessments covered the entire mine life cycle, including post-closure. Gold Fields applied this tool in all its operations and followed that with detailed risk assessments for Peru, South Africa, Australia and Ghana. Operational adaptation plans are being developed to ensure operational resilience.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	challenges and forced outages at the thermal plants. As a result Tarkwa and Damang had to switch to diesel generators for electricity supply, this was however a more expensive and emissions intensive approach. Increases in the intensity and frequency of heavy precipitation events can be equally damaging to mining operations. Flooding events (and associated landslides) can disrupt supply chains and transmission pathways which impair operations. Furthermore storm events								

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	may inhibit downstream shipping and transportation of product. In particular, the remote operations in Western Australia and Peru may be at risk of being disconnected by heavy rains washing away roads. In addition prolonged periods of rainfall can reduce mine productivity as haulage trucks reduce speed when roads are wet. Heavy precipitation events may also cause damage to core operational infrastructure by: destabilising tailing dams, flooding mine pits and increasing								

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	severe environmental events. Managing these risks at Gold Fields' operations can require operation stoppages and incur additional expenditures – both capital and operational in nature.								
Sea level rise	Every day approximately 500 tons of concentrate is transported from the Cerro Corona mine to the warehouse by approximately 30 trucks. The road runs through mountainous geography with steep slopes. There is a high risk of landslides and rock falls as rainfall is	Reduction/disruption in production capacity	1 to 3 years	Direct	Likely	Medium-high	Cerro Corona would lose approximately US$ 1 million for each day the mine is unable to operate.	During April 2016, the main road used by Gold Fields to transport copper concentrate was blocked due a landslide and rock fall. As a result, Gold Fields had to use a much longer alternate road, as well as reduce capacity and truck speed. Gold Fields' Cerro Corona mine has the following response	Gold Fields invested US$ 16.2 million in Social Economic Development which included infrastructure projects. This cost is considered significant in the context of Gold Fields' operations.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	expected to increase, which may disrupt Gold Fields' transport of copper concentrate, as witnessed in April 2016. The copper concentrate is delivered to a warehouse close to the port of Salaverry. The port has three main climate change risks: • Sea level rise; • Storm impacts; • Silting; and • Sea swells. If there is any delay of more than 40 days at the port, the warehouse can't receive more concentrate until the existing stock has been shipped. The concentrate stockpile can only hold up to							strategies in place to mitigate this risk: • Engagement with government for the continual maintenance and upgrading of the roads that can work as alternative for the transport of concentrate (Cerro-Corona – Salaverry); • Collaborative efforts with other large road users for monitoring and reinforcing of bridges or other structure improvement on alternative routes to the port; • Investigate the possibility of increasing the storage capacity for the concentrate warehouse in Salaverry.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	15 days of production. If there are interruptions in the transport, there will be a bottleneck with respect to the storage to concentrate. This could ultimately disrupt operations.								
Change in mean (average) temperature	The International Council on Mining and Metals (ICMM) has identified a number of risks relating to mining operations due to changes in temperature extremes as forecast in the IPCC Fifth Assessment Report (2014). Higher temperatures have an impact on both open cast (such as	Reduction/disruption in production capacity	Up to 1 year	Direct	Likely	Low	The FY2016 energy costs totalled US$289 million and accounted for about 19% of Gold Fields' operating costs. An increase in temperatures and an associated increase in cooling demand will increase energy costs.	Maintaining a healthy workforce requires managing heat fatigue and dehydration in mining operations. Stringent heat stress and dehydration strategies are in place to ensure the health and safety of employees in all of Gold Fields' operations. Gold Fields' Australian operations monitor heat	The cost of developing heat stress and dehydration strategies is managed in-house.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Tarkwa and Damang) and underground operations (such as South Deep). For the Tarkwa and Damang operations an increase of up to 1.5 degrees Celsius is expected by 2035. Coupled with relatively continuous rainfall, high humidity conditions are expected which can be particularly negative for the mines' workforce. As ambient temperature increases so the wet bulb temperature increases too. Higher wet bulb temperatures could mean that evaporation of sweat is inhibited, heat							stress through urine analysers which indicate hydration status. Gold Fields has a comprehensive malaria strategy in place, which incorporates education, prevention, prophylaxis and treatment. It also includes provision of mosquito repellent for workers, support for community health facilities and rapid diagnosis and treatment. In 2016 none of the treated malaria cases proved fatal. Employees and dependants who live in the mine villages have their company housing units sprayed as part of Gold Fields' Malaria Vector Control	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	transfer from the body is reduced and the internal body temperature increases causing heat stress. For Gold Fields' South African and Australian operations temperatures are expected to increase by between 1.5 and 1.8 degrees Celsius by 2035. Higher temperatures have the potential to increase electricity costs, as more cooling will be required to maintain temperatures at the legal operating limit underground. In addition Higher temperatures may require installation of new equipment if the existing							programme. Under this programme a total of 195 company housing units at both mines were sprayed in 2016.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	equipment can't run at the new ambient temperature. Infectious and vector-borne diseases such as malaria or dengue fever are highly sensitive to temperature, precipitation and humidity. Such climate variables have a strong influence on the life-cycles of the vectors and can influence the transmission of water and food borne diseases. Climate conditions for vector-borne diseases are projected to become significantly more favourable for transmission, due to climate change. By 2070, almost all								

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	of Ghana's population will be at risk of malaria (World Health Organisation 2015). This could negatively impact Gold Fields' workforce, and may require additional expenditure on malaria treatment programmes.								

CC5.1c

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other drivers	Social licence to operate: Securing a	Other: Loss of social license to operate resulting in	Up to 1 year	Direct	Unlikely	High	The impact of losing social license to operate will severely impact the long term sustainability of Gold Fields. Losing its social license to operate could result in delays to projects and	Community investment activities have an	Gold Fields' spent US$ 8.5 million

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	social licence to operate is a critical issue for the gold mining industry. The value of a company's assets below ground can only be realised if the social and political environment above ground enables production. A social licence to operate was the fourth highest risk on EY's Top 10 business risks facing mining and	operational disruptions					disruptions at the operations, reduced gold production and ultimately reduced revenue. Other mining companies in Peru that have been impacted by social conflict, such as Newmont, which was required to pay a fine of US$500,000 to the Peruvian government (http://www.nytimes.com/2005/10/25/world/americas/tangled-strands-in-fight-over-peru-gold-mine.html?_r=0). In addition losing social license to operate can have a reputational risk for Gold Fields', as it would make the company less palatable to investors, which could influence the share price.	important role to play in developing and maintaining a social licence to operate. Gold Fields' Cerro Corona mine in Peru is working with USAID and the Lutheran World Relief on climate change adaptation and management of water resources for communities in the Hualgayoc district adjacent to the mine. Amongst the	on socio-economic development and shared value projects in Peru during 2016.

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	metals during 2016 – 2017. Mining operations typically require large volumes of water and are often located in areas that are already water stressed. Climate models predict that there may be increases in the extent and frequency of drought conditions in many of these areas which may exacerbate water scarcity. Gold Fields							measures introduced are the establishment of watershed committees, the development of eight localised water systems to improve irrigation efficiencies and training in sustainable water harvesting. Gold Fields remains committed to responsible water stewardship, which enables shared benefits for its stakeholders & security	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	is aware of its social responsibility to safeguard water and natural resources for surrounding local communities which are often vulnerable and have limited amenities. Especially in Peru, Chile and South Africa, water quality and availability are a key concern for local communities. Other mining companies in Peru have faced							of supply for its operations. Key enabling factors to achieve effective water stewardship include public reporting of water usage & material water risks & engaging proactively with affected stakeholders. Gold Fields adopts a catchment-based water management approach to identify water stewardship risks & provide context for operational	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	fierce opposition from local citizens and government because of water issues which have in the past caused some operations to shut down for a period. Thus the risk of losing the social licence to operate remains high if the Gold Fields' Peruvian operations do not manage their water use under the pressures							water management. At an operational level the mines are tasked with managing operational water inputs & maximising resource sustainability to achieve operational flexibility & cost savings.	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	of climate change. Maintaining such licences is crucial to mining companies as they are physically 'tied' to their mineral deposits and the "life of mine" can span decades - making it essential for mining companies to be able to navigate inter-related and inter-generational social, economic and political dynamics over time. The risk of								

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	not attaining or maintaining a social license to operate can lead to operational disruption, project delays and community dissatisfaction which impacts on productivity and regulatory licensing.								
Reputation	Climate change can present a reputational risk to Gold Fields by affecting the perceptions of the company from its investors. If Gold Fields is not seen	Other: declining interest from investors in your goods/services.	Up to 1 year	Direct	Unlikely	Medium	Estimating financial implications of this risk are difficult to quantify. However if investors perceive Gold Fields to have a good reputation, it may lead to an increase in share price over the long term.	Gold Fields has a number of management strategies aimed at maintaining its reputation as a leader in climate change and carbon performance. These	The cost of drafting the CDP was roughly US$ 26 000 in 2016. In addition Gold Fields invested approximately US$ 9 million on

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	to be adequately contributing to climate change mitigation and adaptation efforts it may stimulate negative investor perceptions. Investors consider environmental, social and governance (ESG) indicators when evaluating investment decisions. There is a strong movement under large institutional investors to focus on ESG							strategies include integrated carbon and energy reduction targets, carbon emission reduction; energy efficiency projects as well as water conservation initiatives. Several investor/analyst roadshows were held to reach out to investors to share on the Group ESG policies and achievements. Public reporting to the CDP, GRI and the Dow Jones Sustainabilit	implementing energy efficiency and emission reduction projects during 2016.

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	indicators. Gold Fields has been tracking investor's interest since 2010 with respect to their opinions regarding climate change issues. Improving investor and analyst confidence is included in Gold Fields' Group 2016 and 2017 Performance Scorecard. The company's share price can be affected by negative investor							y Index (DJSI) is another strategy to manage reputation. In 2016 Gold Fields was recognised as follows: • Achieved A: Leadership in the 2016 CDP Climate Change Response; • Gold Fields was ranked 5th of all 44 mining companies on the 2016 DJSI.	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	perceptions and this in turn can impact on the state of new investor recruitment.								
Other drivers	Supply chain risks: The increasing frequency and intensity of extreme weather events is forecast as one of the possible impacts of climate change. These climate change impacts have the potential to affect the supply chains	Other: Disruption of operations	3 to 6 years	Indirect (Supply chain)	About as likely as not	Low-medium	Disruption of the supply chain, causing a disruption of the operations, may result in revenue losses.	Gold Fields is managing supply chain risk specifically with regards to electricity supply. During 2016, two Genser Power open cycle gas turbine power plants were commissioned at the Tarkwa and Damang mines. The power plants will supply a total of 40	Gold Fields invested US$ 1 million for the two Genser Power gas plants.

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	which Gold Fields depends upon for many of its material needs. Disruptions in the supply of essential materials can reduce the productivity of operations and even cause them to cease completely. Disruptions in the supply chain can also lead to the increased cost of required materials. Extreme storm events have the							MW of electricity. By January 2018, Genser should be in a position to provide 100% of the power supply needs at these operations. The power plants will have sufficient on-site gas storage capacity to meet each mine's total load thereby mitigating any gas supply disruptions.	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	potential to disrupt and delay the shipping of materials (such as activated carbon and propane) and equipment. Activated carbon for gold extraction is imported from the Philippines, while the propane is shipped in from the US. Extreme weather events could cause ports and shipping routes to be closed, which could impact on supply to								

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	both mines. Similarly transport overland (particularly to more remote sites) can be disrupted by flash floods that may occur more frequently. Changing rainfall patterns and drought conditions may affect the availability of water in certain areas. The scarcity of water may make purchasing water as a commodity a challenge.								

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Water is also an important input in the production of a number of mining materials such as cyanide. Water is an important input for electricity generation (hydropower and water for turbine cooling in conventional facilities). In Ghana hydropower schemes contribute a significant portion of Ghana's power, but with dam levels still dropping rapidly, security of								

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	electricity supply at both Tarkwa and Damang remains under threat. Furthermore, the transmission of this electricity can be affected if transmission lines are damaged by extreme weather events.								
Other drivers	Local communities and workforce impacted by climate change: In areas which experience increases in temperatur	Reduction/disruption in production capacity	3 to 6 years	Indirect (Supply chain)	About as likely as not	High	If Gold Fields workforce is negatively impacted by climate change then it may result in reduced productivity. This could result in a reduction of gold produced and ultimately revenue losses.	Gold Fields has a comprehensive malaria strategy in place, which incorporates education, prevention, prophylaxis and treatment. It also	Gold Fields' spent US$ 3.41 million on socio-economic development in Ghana during 2016.

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	e and precipitation there are likely to be increases in the prevalence of vector borne diseases and water borne diseases. Malaria is one such disease that the IPCC forecasts to spread in such areas. Local communities in the region surrounding a mining operation may be affected by these impacts and this may have consequen							includes provision of mosquito repellent for workers, support for community health facilities and rapid diagnosis and treatment. In 2016 none of the treated malaria cases proved fatal. Employees and dependants who live in the mine villages have their company housing units sprayed as part of Gold Fields' Malaria Vector Control	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	ces for the mining operation and the associated work force. Similarly property damage associated with flooding may also affect local communities in the region surrounding mining operations which may impact Gold Fields' work force. Climate change also has the potential to affect food prices globally and this may lead to							programme. Under this programme a total of 195 company housing units at both mines were sprayed in 2016.	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	insecurity in mining communities and even social unrest. Social unrest in mining communities has been known to cause disruptions to mining operations. During 2016, Gold Fields tested 3 181 employees for malaria at both the Tarkwa and Damang mines, of whom 505 tested positive.								

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC5.1e

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC5.1f

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

Further Information

Page: CC6. Climate Change Opportunities

CC6.1

Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Opportunities driven by changes in regulation
Opportunities driven by changes in physical climate parameters

Opportunities driven by changes in other climate-related developments

CC6.1a

Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other regulatory drivers	Carbon Offsets: Gold Fields has the opportunity to generate additional revenue from carbon offsets in both Australia and South Africa. The South African Draft Carbon Offsets Regulations were published on 20 June 2016. The offsets are to be used to encourage locally-based emissions reduction in sectors not directly covered by the proposed South African carbon tax. At	New products/business services	Up to 1 year	Direct	About as likely as not	Low-medium	The Draft Carbon Tax Bill sets a rate of R120 per tCO2. Therefore Gold Fields could sell its carbon credits for anything less than R120. The price would probably be around R100 per carbon credit. During the fifth round of the Australian ERF, the Clean Energy Regulator purchased carbon abatement at an average	Gold Fields is managing the opportunity of carbon offsets by monitoring the developments on the Draft South African Carbon Tax Bill and the Australian ERF via the following memberships: • Chamber of Mines of South Africa; • Industry Task Team on Climate Change • Chamber of Minerals and Energy of Western Australia	The membership fees associated with the Chamber of Mines engagement: US$ 135 711 (the fee is not exclusively for climate change activities) and the ITTCC/Energy Intensive Users Group: US$ 11 224. The membership fee of the Chamber of Minerals and Energy of Western Australia was approximately

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	this stage, based on the draft Carbon Tax Bill, Gold Fields will not be required to pay a direct carbon tax. Gold Fields' therefore has the opportunity to invest in offset projects with the aim of selling the credits to companies impacted by the carbon tax. The Liberal/National coalition government in Australia has brought in the Direct Action Plan (DAP), under the Emissions Reduction Fund, which will serve as the nation's primary climate change policy. The objective of the Emissions						price of $11.82. Both the South African carbon offsets and the Australian ERF could generate an additional source of income for Gold Fields.		US$ 143 363 in 2016. (The fee is not exclusively for climate change activities).

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Reduction Fund is to assist with meeting Australia's emission reduction target of 5% below 2000 levels by 2020. The Emission Reduction Fund incentivises businesses to adopt initiatives to reduce emissions by purchasing these emissions reductions. The Granny Smith gas plant was registered with the Emissions Reduction Fund (ERF). Carbon emission credits based on the gas plant were successfully auctioned to the Australian Government during 2016. There is an opportunity for Gold Fields' remaining								

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Australian operations to take part in the ERF.								

CC6.1b

Please describe your inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Induced changes in natural resources	Forests cover 41 percent of Ghana's land area (FAO 2016). Deforestation is an important environmental issue in the country. Ghana has one of the highest deforestation rates in Africa at 2% annually (IUCN 2016). Timber harvesting and slash-and-burn agriculture are the greatest threats.	Wider social benefits	1 to 3 years	Indirect (Supply chain)	About as likely as not	Medium	This opportunity has the potential to allow Gold Fields to expand existing operations in Ghana which would improve revenue. The region as a whole reported net cash inflow of US$ 100 million during 2016. This figure is indicative of the estimated financial implications of	Gold Fields' Biodiversity Conservation Practice Guide provides guidance on the integration of biodiversity conservation into all aspects of mine life, from pre-feasibility to closure. Gold Fields subscribes to the ICMM Position Statement on Mining and Protected Areas, which includes a	Currently the cost of this management method is related to educating employees, contractors and community members. Topics of education include wildlife conservation, fishing with orthodox methods and mounting of surveillance by Protection Services to ward of hunters, poachers and prevent bush fires.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	There is agreement that continuing changes in precipitation and temperature associated with climate change are very likely to drive important future changes in terrestrial ecosystems throughout Africa (IPCC AR5). Therefore it is apparent that Ghana's forest ecosystem and related biodiversity will be negatively impacted by climate change. Gold Fields' Tarkwa and Damang operations in Ghana are 20 825 ha and 23 666 ha, respectively. These are large mines that have the ability to protect parts of forests that are on their land but are not being mined.						expanding operations in Ghana.	commitment to respect protected areas. As a result Gold Fields' operations have high levels of biodiversity compared to the surrounding areas of the mine. Although mining operations generally tend to exert negative impacts on the environment and biodiversity, the unique environment at the Tarkwa and Damang mines provides an opportunity for biodiversity conservation. Tarkwa and Damang have established 'No hunting' policy as well as prohibition of farming, logging and other habitat degrading human activities. The several secondary forest patches at the Tarkwa mine	The cost of an Environmental Superintendent (as well as one team member) who conducts the training and monitoring is approximately US$ 86,000.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	The mines are also instrumental in developing nurseries on site for rehabilitation purposes. These reforestation skills will empower the local communities. Gold Fields has the opportunity to protect local parts of forests particularly bearing in mind post mine closure, for the local communities. Through protecting local forests, Gold Fields may improve its reputation with local communities and government.							provide safe refuge for a diversity of fauna and flora species on the mine. Also the different kinds of water bodies that have been created as a result of mining operations have provided unique habitat for aquatic fauna and flora. The unusually high number of large mammal species such as bushbuck and red river hog as well as Mona monkey's is the direct result of the ‘no hunting’ policy as well as the availability of safe habitat on the Tarkwa Mines.	

CC6.1c

Please describe your inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	Gold Fields has a primary listing on the JSE Limited, with secondary listings on the New York Stock Exchange (NYSE) and the Swiss Exchange (SWX). Financial backing from investors is important to Gold Fields, and therefore Gold Fields' investors' opinions play a crucial role in the company's reputation. There has been a growing shift of investment interest towards companies that pursue sustainable and socially responsible practices. Investors are increasingly driven to find investment that meets and exceeds environmental, social and governance (ESG)	Increased stock price (market valuation)	Up to 1 year	Direct	Likely	Medium	A positive reputation for Gold Fields has the potential to increase share prices however it is difficult to quantify an exact financial figure.	Gold Fields manages its ESG status, and the opportunity to stimulate investment, through a number of internal strategies and standards. The company has: regional 5 year energy security plans, shared value projects and initiatives for water reuse, recycling and conservation. Gold Fields shares its progress on managing ESG risks and other relevant nonfinancial information through a number of reporting platforms. These include the GRI, DJSI, CDP, JSE SRI, MSCI and other ESG rating agencies, as	The cost of drafting the CDP was roughly US$ 26 000 in 2016. In addition Gold Fields invested approximately US$ 9 million on implementing energy efficiency and emission reduction projects during 2016.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	benchmarks performance. Data and indicators against these principles are also becoming increasingly available to investors. Two-thirds of asset management professionals surveyed (65%) say that they are using sustainable investing strategies to achieve competitive market-rate financial return alongside positive social and/or environmental impact (Morgan Stanley and Bloomberg 2016). Climate change presents an opportunity for Gold Fields to showcase its environmental stewardship and demonstrate its leadership in ESG principles. With							well as through direct engagement with investors and analysts. In 2016 Gold Fields was recognised as follows: • Achieved A: Leadership in the 2016 CDP Climate Change Response; • Gold Fields was ranked 5th of all 44 mining companies on the 2016 DJSI.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	current investor trends this approach may stimulate investment in the company.								
Changing consumer behavior	Historically gold has held its value throughout times of unstable economic or political conditions. Investors have been known to purchase gold in times of global crisis in order to hedge against unforeseen circumstances. Gold is seen as the safest investment in these periods. Climate change is recognised as one of the biggest global risks that humanity will face in the near future. The World Economic Forum classified “extreme weather events” as the	Increased demand for existing products/services	1 to 3 years	Indirect (Client)	About as likely as not	Unknown	In FY2016 Gold Fields produced 2.2 Moz of gold and the average gold price for the reporting year was $1 241 per oz. Thus, assuming 2016 yields, a 1% increase in the group average gold price would translate to $27 million increase in revenue. However, it is uncertain how much the gold price is likely to increase in a time of crisis.	Gold Fields cannot actively manage this opportunity as it is not able to influence or affect the price of gold in the market	No budget is allocated to this opportunity as it cannot be actively managed.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	number one risk in terms of likelihood. “Failure of climate change mitigation and adaptation” was the ranked as the fifth risk in terms of impact. Climate change has the potential to cause widespread instability to economies, societies and political systems. Thus the socio-economic conditions resulting from the impacts of climate change may stimulate demand in the gold market and this presents an opportunity for Gold Fields.								
Other drivers	new market opportunities: Low carbon technologies are becoming more sought after in the global transition towards a green economy as an	Increased demand for existing products/services	>6 years	Indirect (Client)	About as likely as not	Medium	In FY2016 Gold Fields produced 2.2 Moz of gold and the average gold price for the reporting year was $1 241 per	New market opportunities are identified and managed through Gold Fields’ exploration and expansion division. Gold	US$ 39 million was spent on exploration drilling at the Salares Norte project in Chile.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	attempt to mitigate climate change. Gold is a critical component for many of these low carbon and renewable technologies for its conductive properties and high electrode potentials (corrosion resistance). Gold is therefore used in fuel cells, catalytic converters, solar cells and lithium air batteries. There is currently a large amount of research being done into the use of gold in energy generation. The University of California Santa Barbara has found a way to incorporate gold nanoparticles into solar energy technologies as a semiconductor. The University of Pennsylvania is						oz. Thus, assuming 2016 yields, a 1% increase in the group average gold price would translate to $27 million increase in revenue. However, it is uncertain how much the gold price is likely to increase in a time of crisis.	Fields commenced a pre-feasibility study at the Salares Norte project in Chile during 2016. In November 2016, Gold Fields acquired a 50% joint venture interest in and management control of the Gruyere project in Western Australia owned by Australian exploration company Gold Road Resources.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	conducting similar research which may have potential for the powering of nano-circuits. If such technology becomes commercially viable and diffuses into the market there may be an increase in the demand and price of gold. These favourable market conditions would present an opportunity for Gold Fields. In addition, Gold Fields produces copper (31 000 tonnes in 2016) at the Cerro Corona mine in Peru. Copper is a highly efficient conduit which is used in renewable energy systems to generate power from solar, hydro, thermal and wind energy. The use of copper assists in reducing								

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	emissions and lowers the amount of energy needed to produce electricity. Gold Fields therefore has the opportunity to explore potential business from copper production.								
Other drivers	credits from emissions reductions: The Direct Action Plan, including the Emissions Reduction Fund and the Safeguard Mechanism were introduced by Australia's Liberal/National coalition government and serves as the nation's primary climate change policy. The Emissions Reduction Fund assists with meeting Australia's emission reduction targets	Other: income from emissions credits	Up to 1 year	Direct	Likely	Medium	During the fifth round of the Australian ERF, the Clean Energy Regulator purchased carbon abatement at an average price of US$8.87.	Gold Fields manages the emissions credit opportunity related to the Direct Action Plan through engagement with government and through emissions reduction strategies. Gold Fields integrates energy and carbon management into all aspects of its business through its Integrated Energy and Carbon Management Strategy. Gold	The costs of managing this opportunity are best expressed in terms of the membership fee of the Chamber of Minerals and Energy of Western Australia was approximately US$ 143 363 in 2016. (The fee is not exclusively for climate change activities).

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	by incentivising businesses to adopt emissions reduction initiatives through purchasing these emissions reduction credits. The Clean Energy Regulator will issue Australian Carbon Credit Units for emissions reductions from registered projects. Once credits have been issued they can be purchased by the Government through the Emissions Reduction Fund or sold to organisations that wish to offset their emissions. The Granny Smith gas plant was registered with the Emissions Reduction Fund (ERF). Carbon emission credits based on the gas plant were							Fields engages with government through the Chamber of Minerals & Energy of Western Australia. Gold Fields also takes part in carbon policy and energy efficiency discussions at the Carbon Policy and Energy Efficiency Reference Group (CPEERG), hosted by the Chamber.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	successfully auctioned to the Australian Government during 2016. There is an opportunity for Gold Fields' remaining Australian operations to take part in the ERF.								

CC6.1d

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC6.1e

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC6.1f

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

Further Information

Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading

Page: CC7. Emissions Methodology

CC7.1

Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Mon 01 Jan 2007 - Mon 31 Dec 2007	461565
Scope 2 (location-based)	Mon 01 Jan 2007 - Mon 31 Dec 2007	716325
Scope 2 (market-based)	Mon 01 Jan 2007 - Mon 31 Dec 2007	

CC7.2

Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use
ISO 14064-1
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

CC7.2a

If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

CC7.3

Please give the source for the global warming potentials you have used

Gas	Reference
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)

CC7.4

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Diesel/Gas oil	2.67614	kg CO2e per liter	DEFRA 2016 version 1.0
Motor gasoline	2.29968	kg CO2e per liter	DEFRA 2016 version 1.0
Liquefied petroleum gas (LPG)	2.94261	metric tonnes CO2e per metric tonne	DEFRA 2016 version 1.0
Bituminous coal	2.46627	metric tonnes CO2e per metric tonne	DEFRA 2016 version 1.0
Other: Blasting Agents (ANFO)	0.167	metric tonnes CO2e per metric tonne	Australian Greenhouse Office (AGO) Factors and Methods Workbook, Dec 2006.
Other: Oxyacetylene	0.00388	kg CO2e per liter	https://www.theclimateregistry.org/wp-content/uploads/2014/11/2016-Climate-Registry-Default-Emission-Factors.pdf
Natural gas	2.649	metric tonnes CO2e per metric tonne	NGER Measurement NGER Measurement Determination 2016 – 2017.
Electricity	0.581	metric tonnes CO2e per MWh	This electricity emission factor is for Australia North – Granny Smith, Agnew and Darlot operations. The factor was sourced from Transalta Leinster/Mount Keith Scope Two Grid Factor for FY 2015 -16.
Electricity	0.573	metric tonnes CO2e per MWh	This electricity emission factor is for Australia south – St Ives operation. The factor was sourced from Transalta Kalgoorlie/Kambalda Scope Two Grid Factor for FY 2015-16.
Electricity	1.00	metric tonnes CO2e per MWh	This electricity emission factor is for South Africa. It was sourced from the 2016 Eskom Integrated Report, page136.
Electricity	0.54	metric tonnes CO2e per MWh	Ghana’s Biennial Update 2015
Electricity	0.297	metric tonnes CO2e per MWh	This electricity emission factor is for Peru. It was sourced from The Climate Registry 2016 – https://www.theclimateregistry.org/wp-content/uploads/2014/11/2016-Climate-Registry-Default-Emission-Factors.pdf
Electricity	0.35	metric tonnes CO2e per MWh	Electricity generation from propane gas - DEFRA 2016 version 1.0

Further Information

Page: CC8. Emissions Data - (1 Jan 2016 - 31 Dec 2016)

CC8.1

Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Operational control

CC8.2

Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e

544291

CC8.3

Please describe your approach to reporting Scope 2 emissions

Scope 2, location-based	Scope 2, market-based	Comment
We are reporting a Scope 2, location-based figure	We are reporting a Scope 2, market-based figure	Gold Fields has operations in four regions. In South Africa, market-based electricity is not currently available. Market based electricity is however available in Peru, Australia and Ghana. In Peru, there is the option to select an independent power producer (IPP), and then withdraw the electricity from the national Grid. Due to the remote location of Gold Fields' Australian operations, each of the mines have IPPs. In addition Gold Fields' Ghanaian operations have recently agreed to a power purchase agreement with an IPP from December 2016.

CC8.3a

Please provide your gross global Scope 2 emissions figures in metric tonnes CO2e

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
754543	215244	Three of Gold Fields' Australian operations make use of electricity that is sourced from a market-based source. The three operations are St Ives, Agnew and Darlot. Gold Fields' Perth offices also make use of electricity from this source. The electricity is sourced from an Independent Power Producer (IPP) called Transalta. Since December 2016, Tarkwa and Damang receive electricity from two power-gas turbines owned by an IPP - Genser Power. Cerro Corona, in Peru, has renegotiated its electricity tariffs with an IPP for a power purchase agreement extending to 2027.

CC8.4

Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

CC8.4a

Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded

CC8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	Less than or equal to 2%	Metering/ Measurement Constraints Data Management	Diesel, LPG and petrol use is metered in Gold Fields' operations; therefore the uncertainty of these sources is based on metering/measurement constraints. Uncertainty of metering / measurement equipment is typically less than 2%. Oxyacetylene and blasting agents are purchased from the supplier, after which the invoices are used as data input in the carbon footprint. Uncertainty of these sources is therefore based on data management. Gold Fields has high quality management and accounting practices in place, and the data management uncertainty is estimated to be below 2%.
Scope 2 (location-based)	Less than or equal to 2%	Metering/ Measurement Constraints	Based on a review of the reliability of electricity meters, it was found that high quality meters (as used at Gold Fields) are typically below a 2% uncertainty range.
Scope 2 (market-based)	Less than or equal to 2%	Metering/ Measurement Constraints	Based on a review of the reliability of electricity meters, it was found that high quality meters (as used at Gold Fields) are typically below a 2% uncertainty range.

CC8.6

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

CC8.6a

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC8.6a/GF CF Assurance Letter to Gold Fields for CDP_2016.pdf	Dedicated verification section	ISAE3000	100

CC8.6b

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emission Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission

CC8.7

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

CC8.7a

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC8.7a/GF CF Assurance Letter to Gold Fields for CDP_2016.pdf	Dedicated verification section	ISAE3000	100
Market-based	Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC8.7a/GF CF Assurance Letter to Gold Fields for CDP_2016.pdf	Dedicated verification section	ISAE3000	100

CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment

Additional data points verified	Comment
No additional data verified	

CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

CC8.9a

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

Further Information

Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC9.1

Do you have Scope 1 emissions sources in more than one country?

Yes

CC9.1a

Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e
South Africa	8714
Ghana	267488
Australia	233028
Peru	35061

CC9.2

Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

By business division
By facility
By GHG type

CC9.2a

Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)
Head Offices	269
Ghana	267258
Peru	35023

Business division	Scope 1 emissions (metric tonnes CO2e)
South Africa	8713
Australia	233028

CC9.2b

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
South Deep	8713	-26.39802	27.695503
Sandton Main	1	-26.099784	28.067068
Tarkwa	217667	5.249448	-2.004898
Damang	49591	5.226349	-2.024918
Accra Main	230	5.605238	-0.183069
St Ives	101122	-31.208691	121.663284
Agnew	25564	-27.905845	120.704727
Darlot	9672	27.8833	121.2667
Granny Smith	96670	28.9833	122.6833
Perth Main	0	-31.949629	115.841709
Cerro Corona	35023	-6.776103	-78.660736
Lima Main	38	-12.097962	-76.973228

CC9.2c

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	544291

CC9.2d

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)

Further Information

Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC10.1

Do you have Scope 2 emissions sources in more than one country?

Yes

CC10.1a

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
South Africa	525987	0	525987	0
Ghana	228522	3796	434035	0
Australia	0	165894	287705	0
Peru	34	45554	153494	0

CC10.2

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By business division
By facility

CC10.2a

Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
Head Offices	391	129
Ghana	228402	3796
Peru	0	45554

Business division	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
South Africa	525749	0
Australia	0	165765

CC10.2b

Please break down your total gross global Scope 2 emissions by facility

Facility	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
South Deep	525749	0
Sandton Main	238	0
Tarkwa	160947	2539
Damang	67455	1257
Accra Main	119	0
St Ives	0	90323
Agnew	0	52401
Darlot	0	23041
Granny Smith	0	0
Perth Main	0	129
Cerro Corona	0	45554
Lima Main	34	0

CC10.2c

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)

Further Information

Page: CC11. Energy

CC11.1

What percentage of your total operational spend in the reporting year was on energy?

More than 20% but less than or equal to 25%

CC11.2

Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	MWh
Heat	0
Steam	0
Cooling	0

CC11.3

Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year

1866596

CC11.3a

Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Diesel/Gas oil	1835912
Motor gasoline	995
Liquefied petroleum gas (LPG)	28400
Other: Oxyactetylene	1289

CC11.4

Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
No purchases or generation of low carbon electricity, heat, steam or cooling accounted with	0		Three of Gold Fields' Australian operations (St Ives, Agnew, Darlot) and the head office in Perth make use of electricity that is sourced from an IPP, Transalta. The IPP generates electricity from natural gas, which has a much lower emission factor associated with its

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
a low carbon emissions factor			generation when compared to fossil fuels such as coal or diesel. In addition, Gold Fields' Granny Smith mine produces its own electricity from natural gas. The independent power producers supplying electricity to Gold Fields' Peru and Ghana operations also generate electricity from gas. However, as per the CDP guidance, natural gas is not considered a low carbon energy. For this reason Gold Fields does not purchase or generate low carbon electricity, heat, steam or cooling.

CC11.5

Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
1474802	1401103	73581	119	119	Gold Fields' operations Granny Smith, Darlot, Tarkwa (a portion) and Damang produce their own electricity. Granny Smith generated electricity during 2016 from a combination of diesel and natural gas. Darlot only generates a portion of electricity for own use. The majority is sourced from Transalta, a low carbon source electricity generator. Tarkwa and Damang sourced grid electricity and Damang generated electricity from diesel in 2016, when grid was constrained. However in December 2016 the gas power plants were commissioned. In November of 2015, solar panels were

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
					commissioned at the Sandton Head Office. The capacity is 128Kw, and these provide for approximately 50% of the building's electrical load.

Further Information

Page: CC12. Emissions Performance

CC12.1

How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Increased

CC12.1a

Please identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	5	Decrease	In 2016 several emissions reduction projects were implemented, which translated into savings of 72 792 tons CO2e or 4.6%. Significant emission reduction projects included the Granny Smith Gas Fired Power Station and the Tarkwa and Damang Genser Gas Power Plants. The change in emissions due to emission

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
			reduction activities was calculated as follows: total emissions reduced due to emission reduction activities (72 792 CO2e) divided by total scope 1 and 2 emissions in 2015 (1 457 732 tCO2e).
Divestment	0	No change	No divestments occurred during the 2016 calendar year.
Acquisitions	0	No change	Gold Fields bought into a 50% equity stake in the Gruyure Gold Roads project, in Western Australia, which was at feasibility stage, and not operational.
Mergers	0	No change	No mergers were undertaken by Gold Fields during the reporting year.
Change in output	11.8	Increase	Although the ore milled decreased from 38 605 000 tonnes in 2015 to 34 127 000 tonnes in 2016, the mining waste increased from 167 357 000 tonnes to 187 036 0000. This change in mining waste represented an increase in material moved of 11.8%. Such emissions intensity increase during 2016 was mainly due to higher amounts of unsuccessful material drilled at the Agnew mine in Australia.
Change in methodology	0	No change	Due to the notable increase of the Ghana grid emission factor (from 0.21 to 0.54 tons CO2/MWh), Ghana's 2015 scope 2 emissions have been restated. This restatement will allow for a more accurate comparison of the 2015 and 2016 emissions.
Change in boundary	0	No change	N/A
Change in physical operating conditions	0	No change	N/A
Unidentified	0	No change	N/A
Other	10.6	Decrease	Change in emissions due to other reasons was calculated as follows: Absolute difference between 2015 and 2016 (3.87%) - Emission Reduction Activities (5%) + Change in output (11.8%)

CC12.1b

Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.0005506	metric tonnes CO2e	2750000000	Location-based	5.94	Increase	Gold Fields' emissions increased and revenue decreased in 2016 compared to 2015. The emissions increased predominantly due to higher diesel consumption and a change in the Scope 2 location based emission factor for Ghana. The emission factor was updated due to structural changes in Ghana's national grid energy mix.

CC12.3

Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.04437	metric tonnes CO2e	Other: Tonnes of ore milled	34127000	Location-based	29.52	Increase	Although the emissions increased from 2015 to 2016, the tonnes of ore milled decreased significantly, especially at the Agnew site. This was mainly due to the significant amount of unsuccessful material mined at Agnew.

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.6824	metric tonnes CO2e	ounce of gold	2218873	Location-based	15.36	Increase	Gold Fields' emissions increased but ounces of gold mined decreased in 2016 compared to 2015. The emissions increased predominantly due to increased diesel consumption.

Further Information

Page: CC13. Emissions Trading

CC13.1

Do you participate in any emissions trading schemes?

No, but we anticipate doing so in the next 2 years

CC13.1a

Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership

CC13.1b

What is your strategy for complying with the schemes in which you participate or anticipate participating?

Gold Fields integrates energy and carbon management into all aspects of its business through its Integrated Energy and Carbon Management Strategy. This strategy seeks to ensure energy security; decrease carbon emissions; explore immediate and long-term energy efficiency opportunities, and investigate and implement viable sources of renewable energy. In 2016, Gold Fields updated its Group Energy and Carbon Management Guideline to align with ISO 50001. Each region supported and implemented the Group Energy and Carbon Management Guideline by developing regional energy and emission reduction targets. Gold Fields is investigating setting short-term operational targets for energy use, cost and carbon emissions for 2017 against annual energy and production plans. They will consider absolute GJ, energy cost (US$) and absolute carbon emissions (tonnes CO2eq) avoided, based on planned and feasible initiatives.

CC13.2

Has your organization originated any project-based carbon credits or purchased any within the reporting period?

Yes

CC13.2a

Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits canceled	Purpose, e.g. compliance
Credit origination	Fossil fuel switch	Granny Smith gas plant	Other: Australian Emissions Reduction Fund	85845	85845	Yes	Voluntary Offsetting

Further Information

Page: CC14. Scope 3 Emissions

CC14.1

Please account for your organization's Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	171212	Activity data: The following major cost and volume purchased goods and services for Gold Fields have been included in the carbon footprint: Lime, cement, caustic soda, purchased water and cyanide. Activity data for the purchased goods is gathered from invoices and receipts provided by the relevant suppliers and then uploaded onto the GRI portal (a non-financial data capture and management system). Emission factors: Lime and Cement emission factors were obtained from the Inventory of Carbon and Energy (University of Bath, 2011), and the caustic soda emission factor was obtained from the CCalc Tool Manual (V1.1) (2010). The emission factor for purchased water was obtained from the Rand Water Board of South Africa (2012). The cyanide emission factor was obtained from an unregistered CDM project, titled: "Increase in hydrogen cyanide production by the Andrussow process instead of by the Acrylonitrile sub route process in Candeias, Brazil". Care is taken to obtain internationally recognized emission factors, unless the emission factor is country specific, such as the water emission factor. GWP	100.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The methodology used as per this ISO standard was the multiplication of activity data (obtained from the GRI portal) with emission factors. Assumptions and allocation methods: In this specific scope 3 category, no assumptions were made or allocation methods applied. Data quality: The quality of the consumption data reported on the GRI Portal, and the emission factors used both influence the data quality. The data reported in the GRI Portal are subject to strict internal review procedures and the total scope 1, 2 and 3 emissions form part of an annual audit conducted by an independent third party (please refer to attached verification statement for procedures performed).		
Capital goods	Relevant, calculated	368	Activity data: The capital spends during 2016 correspondent to the purchases of capital goods. Gold Fields' purchases in 2016 include trucks, drills, loaders, and excavators. Activity data for the capital goods was gathered from invoices and receipts provided by the relevant suppliers. Emission factors: Each emission factor associated with the equipment was calculated by dividing the price of each vehicle/machine by the total revenue	0.00%	The emission factor used in this category was not calculated using data obtained from suppliers or value chain partners. The data used in the emission factor calculation was obtained from the annual report communications.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			of its producing company (as stated in their respective annual reports). GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The financial spend per equipment (activity data) was multiplied by the calculated emission factor to estimate the emissions from the production of the equipment. Assumptions and allocation methods: In cases where emission factors were not available, an in-house estimation has been undertaken based total cost of the capital good in relation to the total revenue and total emissions from the manufacturing company. The total emissions for Komatsu were not available in their annual report, and therefore the emission factor associated with the production of one Komatsu ROM Loader could not be calculated. Therefore the assumption was made that the emissions for from the production of a Komatsu ROM Loader would be the average of the emissions from the two Atlas Copco trucks. Data quality: The financial spend per capital good is reported on Gold Fields' financial system. The data reported on in the financial system is subject to strict internal review procedures and an annual audit conducted by an independent third party. The exact figures used for this calculation are captured		

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			on the financial system and form part of the total spend on capital goods during 2016. The calculation of the emission factor is based on the available annual or sustainability reports of the producers. These calculations are subject to a financial audit and limited assurance was achieved for emissions.		
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	227901	Activity data: Gold Fields has life cycle emissions associated with fuel-and-energy related activities (not reported in scope 1 or 2) from: diesel, petrol, contractor fuel, LPG, Natural Gas, and blasting agents. In addition to these life cycle emissions, transmission and distribution losses were also included for South African operations but have not been included for Australia, Peru and Ghana operations. This consumption data is recorded by the Gold Fields operations and uploaded onto the GRI portal. The transmission and distribution losses data is a percentage of the electricity used and is obtained from Eskom for the South African operation, South Deep as well as the Gold Fields' Head Office in Johannesburg. Emission factors: The emission factor for the transmission and distribution losses for the South African operation was obtained directly from the Eskom Annual Report 2016. The emission factors for diesel, petrol and LPG, natural gas and propane were obtained from the DEFRA Emission Factors for 2016 version 1.0, while the emission factor for	100.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			blasting agents was obtained from the CCalc Tool Manual (V1.1) (2010). GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The methodology used as per this ISO standard was the multiplication of activity data (obtained from the GRI portal) with emission factors. Assumptions and allocation methods: In this specific scope 3 category, no assumptions were made or allocation methods applied, as activity data (obtained from the GRI portal) was multiplied with emission factors. Data quality: The quality of the consumption data reported on in the GRI Portal, and the emission factors used both influence the data quality. The data reported on in the GRI Portal is subject to strict internal review procedures and the total scope 1, 2 and 3 emissions forms part of an annual audit conducted by an independent third party (please refer to attached verification statement for procedures performed).		
Upstream transportation and distribution	Relevant, calculated	26679	Activity data: In this category Gold Fields includes the transportation of the goods and services, as well as fuel and energy related products. The tonnes of goods transported from the supplier are collated from receipts and invoices provided by	0.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			the supplier. This data is then uploaded onto the GRI portal. Emission factors: The road freight emission factor used for this category is obtained from the DEFRA Emission Factors for 2016 V1.0. The DEFRA emission factors were used as an international representative for the four geographic regions in which Gold Fields operates. GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The methodology used as per this ISO standard was the multiplication of activity data (obtained from the GRI portal) with emission factors. Assumptions and allocation methods: In this category, it was assumed that all products were transported 100 kilometres. The assumed average transportation distances were internally reviewed and are expected to give a fair representation of the actual emissions. Data quality: The quality of the consumption data reported on in the GRI Portal, and the emission factors used both influence the data quality. The data reported on in the GRI Portal is subject to strict internal review procedures and the total scope 1, 2 and 3 emissions forms part of an annual audit conducted by an independent third party (please refer to attached verification statement for procedures performed).		

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Waste generated in operations	Relevant, calculated	1966	Activity data: The landfilled waste generated in each of the Gold Fields operations was recorded. The consumption data was then uploaded onto the GRI portal. Emission factors: A generic emission factor for waste was used, and obtained from the USA Environmental Protection Agency and is expected to be reliable and applicable as an international average for Gold Field's operations. GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The waste data (obtained from the GRI portal) was multiplied with the applicable emission factor. 100% of the data used was classified as primary data. The primary data used included company-specific metric tons of waste generated. Assumptions and allocation methods: In this specific category, no assumptions were made or allocation methods applied. Data quality: The quality of the consumption data reported on the GRI Portal, and the emission factors used, both influence the data quality. The data reported in the GRI Portal is subject to strict internal review procedures and the total scope 1, 2 and 3 emissions forms part of an annual audit conducted by an independent third party (please refer to attached verification statement for procedures performed).	100.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Business travel	Relevant, calculated	7467	Activity data: The business travel category for Gold Fields includes air travel and road travel emissions. The primary activity data for air travel and car hire is obtained from Gold Fields' travel agents. Employee business travel using privately owned cars and distances travelled is obtained from the internal SAP system. Gold Fields engages with the travel agent, regarding the template that must be used to collate the flight and car rental data. The activity data is then uploaded onto the GRI portal. Emission factors: The emission factors for air travel, were used according to km travelled, classifying each flight as either domestic, short-haul (<3700 km) or long-haul (>3700 km). The factors were obtained from the DEFRA Emission Factors 2016 version 1.0. GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The business travel data (obtained from the GRI portal) was multiplied with the applicable emission factor. 100% of the data used was classified as primary data. Assumptions and allocation methods: Assumptions were made with respect to the efficiency of fuel consumption, required in order to convert kilometres claimed to litres, for car hire. Data quality: The quality of the consumption data	100.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			reported on in the GRI Portal, and the emission factors used both influence the data quality. The data reported on in the GRI Portal is subject to strict internal review procedures and the total scope 1, 2 and 3 emissions forms part of an annual audit conducted by an independent third party (please refer to attached verification statement for procedures performed).		
Employee commuting	Relevant, calculated	4283	Activity data: Gold Fields employee commuting covers the transportation of employees between their homes and work sites in vehicles not owned or operated by Gold Fields (excluding contractors). The total number of employees is captured by the internal SAP system. Emission factors: The emission factors associated with employee commuting are linked to the fuel use, and uses the scope 1 petrol and diesel emission factors obtained from the DEFRA Emission Factors 2016 version 1.0. GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The total km travelled (activity data) were multiplied by the petrol or diesel emission factor. Assumptions and allocation methods: The following assumptions were used to calculate the total distance driven by employees in one year: 1)	0.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			20% of the companies' employees use private transport, 2) 80% of this transport is petrol based, 20% of this transport is diesel based, 3) the average distance travelled per day per employee is 40 km. 4) an average petrol consumption was assumed for employee commuting, of 11km/litre; and average diesel consumption of 14km/litre. It was assumed that each employee works 230 days a year. The emissions reported for this category are mainly based on assumptions and therefore expected to be less precise than the emissions reported for the other categories. Data quality: The quality of the consumption data reported on in the GRI Portal, and the emission factors used both influence the data quality. The data reported on in the GRI Portal is subject to strict internal review procedures and the total scope 1, 2 and 3 emissions forms part of an annual audit conducted by an independent third party (please refer to attached verification statement for procedures performed).		
Upstream leased assets	Not relevant, explanation provided				The emissions associated with upstream leased assets are estimated to be insignificant and therefore not included in the carbon footprint. Gold Fields mainly makes use of contractors and their equipment for activities not performed in-house. Contractor fuel use is collected and reported on as scope 3 (Fuel and Energy Related Activities) emissions.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Downstream transportation and distribution	Relevant, calculated	8527	Activity data: Downstream transportation and distribution for Gold Fields covers the emissions related to the transportation of produced gold to the refineries. The activity data for the South African operation South Deep was recorded in time (hours) taken for aviation transportation. The activity data for the South American, West African and Australian operations was recorded by each operation in amount of tonnes transported and the distance travelled for the freight transportation. This activity data was then uploaded onto the GRI portal. Emission factors: The emission factor for aviation turbine fuel is obtained from the DEFRA Emission Factors 2015 version 2.0 The average aviation fuel efficiency was obtained from Universal Helicopters. The emission factors for domestic and international flights for the international operations are obtained from the DEFRA Emission Factors 2016 version 1.0 GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The methodology used as per this ISO standard was the multiplication of activity data (obtained from the GRI portal) with emission factors. Assumptions and allocation methods: In this specific category, no assumptions were made or allocation methods applied. Data quality: The	100.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			quality of the consumption data reported on in the GRI Portal, and the emission factors used, both influence the data quality. The data reported on in the GRI Portal is subject to strict internal review procedures and the total scope 1, 2 and 3 emissions forms part of an annual audit conducted by an independent third party (please refer to attached verification statement for procedures performed).		
Processing of sold products	Relevant, calculated	427	Activity data: Processing of sold products for Gold Fields covers the emissions associated with the refining and smelting of gold. The gold production, in ounces, is reported per operation as primary data and uploaded onto the GRI portal. Emission factors: The amount of energy required to refine and smelt a tonne of gold was obtained from internal Gold Fields' records. Multiplying this by the relevant national grid emission factors the emission factor (tCO2/tonne of gold) for each country was calculated. GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. The methodology used as per this ISO standard was the multiplication of activity data (obtained from the GRI portal) with emission factors. Assumptions and allocation methods: In this	0.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			specific category, no assumptions were made or allocation methods applied. Data quality: The primary data (gold produced) is typically of high quality, as this is an intensively monitored performance determinant. The data forms part of an annual audit on total scope 1, 2 and 3 emissions performed by an independent third party (please refer to attached verification statement for procedures performed).		
Use of sold products	Not relevant, explanation provided				The emissions associated with the use of sold gold products are estimated to be insignificant.
End of life treatment of sold products	Relevant, calculated	852	Activity data: End of life treatment of sold products for Gold Fields relates to the gold produced, which is assumed to be recycled twice. The amount of gold produced (primary data) was obtained from the GRI portal. Emission factors: This emission factors (tCO2/tonne of gold) are calculated by multiplying the energy required to refine and smelt gold (Gold Fields internal calculations) with the relevant national grid emission factors. GWP values: A GWP value of 1 was used for carbon dioxide. Methodologies: Scope 3 emissions calculations were completed in accordance with ISO 14064-1 and the GHG Protocol: Corporate Value Chain (scope 3) Accounting and Reporting Standard. Refining and smelting of gold does not typically occur in the country that it was mined. For this reason electricity emission factors of the	0.00%	N/A

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			countries in which the gold was refined were used to calculate emissions. These countries include South Africa, Australia and USA. Assumptions and allocation methods: It was assumed that all gold product is recycled twice and when recycled it is subject to full refining and smelting. Data quality: The amount of gold produced by Gold Fields in 2016 is expected to be highly reliable due to the importance of this data. This data forms part of an annual audit on total scope 1, 2 and 3 emissions performed by an independent third party (please refer to attached verification statement for procedures performed).		
Downstream leased assets	Not relevant, explanation provided				Gold Fields does not make use of downstream leased assets and therefore this category is found not to be applicable to the company.
Franchises	Not relevant, explanation provided				Gold Fields does not have any franchises; this category is therefore not applicable to the company.
Investments	Not relevant, explanation provided				Investments in which Gold Fields has a minority share are not included in the carbon footprint as Gold Fields does not have an influence on the operational aspects of these companies and therefore does not have control over the emissions. Gold Fields is the majority owner of all its operations.
Other (upstream)	Not relevant, explanation provided				Gold Fields has no other upstream emissions relevant to operations.

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Other (downstream)	Not relevant, explanation provided				Gold Fields has no other downstream emissions relevant to operations.

CC14.2

Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

Third party verification or assurance process in place

CC14.2a

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2017/77/7577/Climate Change 2017/Shared Documents/Attachments/CC14.2a/GF CF Assurance Letter to Gold Fields for CDP_2016.pdf	Dedicated verification section	ISAE3000	100

CC14.3

Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

CC14.3a

Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Purchased goods & services	Other: Purchased Goods and Services increased due to an increase in the amount of lime, cement and caustic soda purchased.	2	Increase	The increase in emissions from purchased goods and services mostly results from an increase in the use lime, cement and caustic soda.

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Capital goods	Other: Capital procurement	142	Increase	The expenditure on new vehicles and equipment purchased in this reporting year was greater than in the previous year. This resulted in an increase in emissions from the purchasing of capital goods.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Emissions reduction activities	2.6	Decrease	Gold Fields fuel-and-energy related emissions (not included in scope 1 or 2) decreased due to emission reduction projects implemented during 2016. Emissions reduction projects implemented during the target period include the Granny Smith gas power station and the Tarkwa and Damang Genser gas power plants. The emissions value percentage was calculated as follows: (11 434 tCO2e / 439 890 tCO2e) * 100 = 2.6%.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Change in output	11.8	Increase	Although the ore milled decreased from 38 605 000 tonnes in 2015 to 34 127 000 tonnes in 2016, the mining waste increased from 167 357 000 tonnes to 187 036 0000. This change in mining waste represented an increase in material moved of 11.8%. Such emissions intensity increase during 2016 was mainly due to higher amounts of unsuccessful material drilled at the Agnew mine in Australia.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Unidentified	7.2	Decrease	This decrease may be attributed to the switch in fuels (specifically diesel to natural gas and propane) for electricity generation at some of the operations.
Upstream transportation & distribution	Other: Increased consumption of natural gas	322	Increase	During 2016, Gold Fields' Granny Smith operation switched from diesel powered electricity to natural gas powered electricity. In addition Ghana switched from grid electricity to natural gas powered electricity. Upstream transportation and distribution has increased at both of these operations due to the purchase and transport of natural gas.
Waste generated in operations	Other: Change in amount of waste produced	4	Increase	The emissions associated with waste increased due to an increase in the amount of waste produced.
Business travel	Other: reduced car hire	2	Decrease	The emissions associated with business travel decreased due to reduced car hire.
Employee commuting	Other: Reduced number of employees	1	Decrease	The employee commuting emissions decreased in this reporting year due to a decrease in the number of employees employed by Gold Fields.
Downstream transportation and distribution	Change in output	2	Increase	Downstream transportation and distribution emissions increased due to an increase in the tons of processed sold product.

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Processing of sold products	Change in output	20	Increase	Emissions from processing of sold products increased due to an increase in the carbon intensity for the processing of gold in Ghana.
End-of-life treatment of sold products	Change in output	20	Increase	Emissions from End-of-life treatment of sold products increased due to an increase in the carbon intensity for the processing of gold in Ghana.

CC14.4

Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)

Yes, our suppliers
Yes, other partners in the value chain

CC14.4a

Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success

“Other partners in the value chain”

Gold Fields considers local mining communities and local suppliers critical partners in our mining operations value chain. VuInerable communities are particularly susceptible to the impacts of climate change. Gold Fields’ engagements with communities are aimed at increasing the resilience of the communities. If community resilience is increased then communities will be better equipped to adapt to the impacts of climate change. Our suppliers are equally impacted by effects of climate change.

i.) Method of engagement: The communities in which Gold Fields operates are directly dependent on the sustainability and growth of the mines. One of the biggest challenges facing mining companies is building long lasting relationships and trust with these host communities over more than one generation. Without ongoing trust there is potential for operational disruption, project delays and cancellations throughout the life of mine which could be 30 years. It takes substantial time, effort and resources to establish and maintain a strong social license to operate. Consequently, Gold Fields’ ability to grow through the expansion of existing mines and the development of new projects is determined by their ability to build strong relationships and trust with local communities. An example of community engagement is at Gold Fields’ Cerro Corona mine, where Gold Fields partnered with non-governmental organizations to increase awareness on climate change impacts and

assisted with provision of water reservoirs.

ii.) Strategy for prioritization: Gold Fields prioritizes community engagement by including development and implementation of community engagement strategies in each region as a group score card objective for 2016.

iii.) Measure of success: Gold Fields invested US$ 16.2 million in local communities during 2016 and spent $558 million in host community procurement, this spend represents 41% of Gold Fields' goods and services. In 2016, just under halve of our total workforce is sourced from host communities (8 567 people).

"Suppliers"
Suppliers are a critical part of Gold Fields' support in the mining value chain, increasingly those suppliers of energy goods, services and low-carbon technologies. Gold Fields has a strategic intent to empower local suppliers and Gold Fields' climate change policy commits Gold Fields to promote climate change awareness to its partners and suppliers. The physical impacts of climate change also affect our suppliers and could disrupt the supply chain.
i.) Method of engagement
Suppliers are engaged through supplier development initiatives and annual meetings with suppliers. Local suppliers are identified, developed and empowered through strategic regional programs. For carbon emission reduction initiatives, Gold Fields engages both local and global suppliers to promote transfer of international skills to ensure that regions benefit from global pool of knowledge.

ii.) Strategy for prioritization
Gold Fields prioritizes suppliers and local community supplier engagements by including development and implementation of community engagement strategies and local spend targets in each region as a group score card objective for 2016.

iii.) Measure of success
Gold Fields is transitioning to measure impact of initiatives and programs through outcomes based measures, using measures such as job created by those suppliers.

CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
Emissions reduction incentives	4	0.36%	Gold Fields collaborates with these suppliers on energy efficiency, renewable energy studies and emissions reduction initiatives; planned for implementation in 2017 and those implemented in 2016. The $5 million spend on these suppliers specifically focused on emission reduction initiatives and is against a Gold Fields annual operating

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
			spend of $1,362 million. This represents a carbon emissions reduction potential of 60 000 tCO2e per annum once fully implemented, as well as security of supply for Gold Fields's operations. Where possible, Gold fields seeks to procure goods and services from the countries in which it operates, and where feasible, its host communities. This spend facilitates creation of jobs in the local communities, thus assisting Gold Fields' operations to maintain license to operate. Specifically at Gold Fields' South Deep mine, host community suppliers engaged in 2016 increased to 84 and represented $24 million, equivalent to 14% of total spend, compared to $15 million in 2015. At Gold Fields' South Deep mine in South Africa, 871 jobs were created by suppliers supported by South Deep local procurement program. As part of Gold Fields integrated energy and carbon management strategy, regions have included energy efficiency criterion in the procurement specifications.

CC14.4c

Please explain why you do not engage with any elements of your value chain on GHG emissions and climate change strategies, and any plans you have to develop an engagement strategy in the future

Further Information

Module: Sign Off

Page: CC15. Sign Off

CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category

Name	Job title	Corresponding job category
Nick Holland	Chief Executive Officer	Chief Executive Officer (CEO)

Further Information

CDP 2017 Climate Change 2017 Information Request