Gold Fields

Investor CDP Information Request

CDP 2011

May 2011

Report compiled by

PROMETHIUM CARBON

Introduction

0. Introduction

0.1 Introduction

Please give a general description and introduction to your organization.

Gold Fields is one of the world's largest unhedged producers of gold with attributable, annualised production of 3.6 million gold equivalent ounces from eight operating mines in Australia, Ghana, Peru and South Africa. Gold Fields also has an extensive and diverse global growth pipeline with four major projects in resource development and feasibility. Gold Fields has total attributable gold equivalent Mineral Reserves of 76.7 million ounces and Mineral Resources of 225.4 million ounces.

Gold Fields is listed on the JSE Limited (primary listing), the New York Stock Exchange (NYSE), NASDAQ Dubai Limited, Euronext in Brussels (NYX) and the Swiss Exchange (SWX).

Gold Fields is responsible for mining and concentrating the gold and copper at the operations, from where it is sent to be refined further at various refineries. These refineries are not under the sole ownership of Gold Fields.

The location and nature of Gold Fields operations is as follows:

The South African operations are all underground mines:

1. KDC West & KDC East (26° 24'S and 27° 36'E)
2. Beatrix (28° 15'S and 26° 47'E)
3. South Deep (26º 25' S and 27º 40' E)

The Ghanaian operations are all open pit mines:

1. Tarkwa (5° 15' N and 2° 00' W)
2. Damang (5° 11'N and 1° 57'W)

The Australian operations are a combination of underground and open pit mines:

1. St Ives (31° 12'S and 121° 40'E)
2. Agnew (27° 55'S and 120° 42'E)

Cerro Corona is an open pit copper and gold mine located in Peru (6° 45'S and 78° 37'W)

St. Ives and Agnew are located Australia, an Annex I country with emission reduction obligations. The rest of the operations are located in Non-Annex I countries which have ratified the Kyoto Protocol. Non-Annex I countries are developing countries which may participate in the Clean Development Mechanism (CDM) and, therefore, have the potential to receive income for the implementation of emission reduction projects.

Introduction

As Gold Fields has operations in both Annex 1 and Non-Annex 1 countries, they are exposed to a number of risks associated with operating in both developed and developing countries. Some of the major risks identified in this CDP response are listed below:

i. The introduction of carbon pricing (probably cap-and-trade) in Australia in the near future will impact on the operating costs of the Australian operations.

ii. South Africa will introduce carbon tax in the future, but there is uncertainty about what form this tax will take. Carbon tax will increase the operating costs of South African operations.

iii. In Peru and Ghana, there are currently no climate change regulations. There is uncertainty about what the impact of such regulations would be if they were to be introduced in the future.

iv. The operations are exposed to physical risks including temperature rise and changes in rainfall variability; which could dramatically impact on mining operations.

Annual Report:
http://overendstudio.co.za/online_reports/gold_fields_ar2011/index.php

Sustainability Report:
http://www.goldfields.co.za/pdf/sustainability_reports/sustainability_report_2010.pdf

Company Revenue for the period of 01 Jan 2010 – 31 Dec 2010:
R34,391 million

ISIN number:
ZAE000018123

CUSIP number:
38059T106

SEDOL number:
6280215

Introduction

0.2 Reporting Year

Please state the start and end date of the year for which you are reporting data.

Enter Periods that will be disclosed
01 January 2010 – 31 December 2010

0.3 Country list configuration

Please select the countries for which you will be supplying data. This selection will be carried forward to assist you in completing your response.

Select country
South Africa
Australia
Ghana
Peru

0.4 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.

Select currency
Rand (SA)

0.5 Please select if you wish to complete a shorter information request

You may have been given the option of answering a shortened information request because (a) you have identified that you meet the criteria for Small and Medium Sized Enterprises (SMEs) in the ORS portal or (b) your company's profile (e.g. where your company is headquartered and the number of times you have been asked to respond) indicates that you are eligible.

0.6 Modules

As part of the Investor CDP information request, electric utilities, companies with electric utility activities or assets, companies in the automobile or auto component manufacture sectors and companies in the oil and gas industry should complete supplementary questions in addition to the main questionnaire.

If you are in these sectors, the corresponding sector modules will be marked as default options to your information request.

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. If you wish to view the questions first, please see www.cdproject.net/cdp-questionnaire.

Management

1. Governance

Group and Individual Responsibility (CDP 2010 Q1.1)

1.1 Where is the highest level of responsibility for climate change within your company?
Individual/sub-set of the Board or other committee appointed by the board

1.1a Please identify the position of the individual or name of the committee with this responsibility
Safety, health and sustainable development committee (SHSD Committee)

Individual Performance (CDP 2010 Q1.4-1.5)

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

If yes
1.2a Please complete the table
(All three incentivized performance indicators are applicable, though the bold one is most important)

Who is entitled to benefit from those incentives?	The type of incentives	Incentivized performance indicator
Corporate executive team	Monetary reward	• Meeting emission reduction targets • Communicating climate change issues • **Generating business related to climate change strategy**
Energy managers	Monetary reward	• **Meeting emission reduction targets** • Communicating climate change issues • Generating business related to climate change strategy

2. Strategy

Risk Management Approach (CDP 2010 Q2.1)

2.1 Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities
This question should be answered by selecting one of the three options available:

- ***Integrated into multi-disciplinary companywide risk management processes***
  - *A documented process where climate change risks and opportunities are integrated into the company's centralized enterprise risk management program covering all possible types/sources of risks and opportunities*
- *A specific climate change risk management process*
  - *A documented process which considers climate change risks and opportunities separate from other business risks and opportunities*

- *There are no documented processes for assessing and managing risk and opportunities from climate change*

2.1a Please provide further details (see guidance)

Gold Fields has a well developed and embedded Enterprise Wide Risk Management (EWRM) process. This system draws from international best practice and is based on the risk management requirements of King III code on corporate governance and the ISO 31000 International guideline for risk management. Risks are integrated into one platform which allows for all risks to be evaluated for significance on the same basis. The evaluations matrices that have been developed for the risk management system take cognisance of all components of risk and cater for the application of a sustainable development approach. The evaluation matrix utilises numerous components of sustainable development to assess the consequence of a risk manifesting. Thus, the evaluation matrices effectively assess consequences such as financial implications, possibility of a serious safety incident, possibility of a negative environmental event through to reputational impacts to the business as opposed to the likelihood of such an event occurring. The risk management section of the Carbon Management Strategy (CMS) is integrated into the corporate risk management strategy
All risks identified as being significant to the business have applied mitigation actions with responsibility assigned. The risk registers are reviewed on a quarterly basis as part of the normal operational reviews and assessed on a 6 monthly basis by the Executive Committee and the Board in terms of applicability and effectiveness.

- *The scope of the process (regulatory, customer behaviour changes, reputational and weather related risks and opportunities)*

Gold Fields' comprehensive Carbon Management Strategy was drafted in 2009, approved by the Board in November 2010 and updated beginning of 2011. It incorporates the identification of risks and opportunities presented by climate change and the change in the world economy. This includes physical, regulatory, market, custom behaviour changes, perception and other risks and opportunities.

The Carbon Management Strategy ensures that the company commits sufficient resources in its environmental and community engagement structures at an operational and corporate level so as to enable it to operate in a proactive and legally compliant manner. The Carbon Management Policy is linked to the Risk Policy. The Risk Policy guides the consistent and systematic assessment of risk and the procedures for risk reporting and risk mitigation measures across the group's global operations. The Carbon Management Strategy is updated on an annual basis to ensure that it stays relevant in the rapidly changing environment.

- *How risks and opportunities are assessed at a company level*

The **Board**, via the Audit Committee, is responsible for the overall system of risk management. The Audit Committee oversees the changing environment within which the group operates and is responsible for the identification and mitigation of new and existing risks on an ongoing basis. The Group Risk Manager ensures that the process of risk management takes place at a corporate level. All risks identified in our risk management process have control measures and mitigating strategies in place.

Gold Fields has 4 types of enterprise wide risk registers:

1. Individual operations and Service Divisions
2. Regional Risk Registers
3. Certain specialised company-wide e.g. Technical, Climate Change
4. Corporate

Once captured in a register each risk is subjected to a process which:

- Defines the risk issue and its context
- Defines the business implications of the risk
- Defines the primary controls in place and estimates the effectiveness of these controls
- Specifies the responsible manager
- Specifies further actions risk mitigation strategies
- Estimates the severity and probability of the risk occurring. The severity rating includes the financial impact of the risk
- Evaluates the risk rating = severity x probability

The process of compiling the risk registers is used to strengthen the role of risk management within broader operational management. The intention is to be more informed and pro-active which allows for remedial action to be taken often before the risks materialise.

- *How risk and opportunities are assessed at an asset level*

A comprehensive physical risk management programme is in place which is monitored on an ongoing basis as part of the operational process. The insurance market assesses our assets and the degree to which we comply with their requirements on an annual basis. Gold Fields as a whole and all its operation companies are in the top quartile of companies participating in these insurance asset surveys. Gold Fields strives to manage risk effectively in order to protect the company's assets, stakeholders, environment and reputation and to ensure achievement of the business objectives. The aim is to achieve a fuller understanding of the reward/risk balance and seeks to reduce the likelihood and consequences of adverse effects to acceptable levels and to achieve continual improvement in its management of risk, thereby enhancing the degree of certainty in achieving its objectives.

- *The frequency of monitoring*

The risk registers are reviewed on a quarterly basis as part of the normal operational reviews and assessed on a 6 monthly basis by the Executive Committee and the Board in terms of applicability and effectiveness. The Internet web based Cura electronic risk management software solution has been fully functional since early 2009 and is used to record and monitor strategic risks to which the operations, regions and corporate are exposed. An auditing function is included in the software in

order to conduct ongoing internal assurances that mitigating strategies for risks are receiving the required attention. The audits are conducted by an internal controller on each operation and region.

- *Criteria for determining materiality/priorities*

A risk is evaluated on its materiality based on its risk rating. Risk rating is determined as being the product of the severity and the probability. The severity and probability of each risk is determined "in committee" by experienced and knowledgeable individuals.

- *To whom are the results reported*

Gold Fields' board has established a Safety, Health and Sustainable Development Committee (SHSD Committee). Climate change risks and issues are the responsibility of this committee. The SHSD Committee reports to the Board.

The Board of Directors has established and maintains internal controls and procedures, which are reviewed regularly for effectiveness. These controls and procedures are designed to manage, rather than eliminate, the risk of failure, and provide reasonable, but not absolute, assurance that there is an adequate system of internal control in place.

The progress and status of the carbon management efforts of Gold Fields are reported to the Board and Executive committees since 2005. The Executive Committees are kept informed through updates at committee meetings held quarterly. Quarterly reports contain a section on carbon management.

Business Strategy (CDP 2010 Q1.2-1.3; Q9.1)

2.2 Is climate change integrated into your business strategy?

Yes

If yes: **2.2a Please describe the process outcomes (see guidance) (max 7000 characters)**

It is Gold Fields' objective to maximise the economic value of the reserves it mines over the life of the reserve. This is fundamental in the way Gold Fields has done business, and the principle is more valid in our currently changing world than what it was before. Gold Fields has gold reserves with lives of mine extending beyond 2050. The company understands that the world must reduce its greenhouse gas emissions by between 60% and 80% below the 1990 levels by 2050. It also understands that this can only be achieved if the whole world economy is fundamentally re-structured. Gold Fields has been active in the alignment of its company and operations with the emerging low carbon world economy since 2005.

Management

i. How the business strategy has been influenced, i.e. the internal communication/reporting processes that achieve this:

The Gold Fields Carbon Management Strategy has a section dealing with communication. This section focuses on both internal (people working for Gold Fields) and external stakeholders. Communication with the internal stakeholders focussed on (1) distribution of the Carbon Management Strategy to managers at the end of 2009, (2) the drafting, printing and distribution of a Carbon Management Toolkit in 2010, and internal publication of Gold Fields successes in the carbon management space. These successes include, in 2010, winning the Energy Risk Deal of the Year Award for the Beatrix Methane Project emission reduction purchase agreement and being awarded a joint first place in the 2010 CDLI. The communication of early successes in this arena added to the momentum of carbon management effort and helped to influence the way in which Gold Fields do business.

ii. What climate change aspects have influenced the carbon strategy:

The Gold Fields Carbon Management Strategy is based on analysis of the internal and external environments in which Gold Fields operates. This analysis focuses on understanding the impacts of the physical, regulatory, economic, and other influences of climate change on the environments in which Gold Fields finds them, with respect to both the risks and the opportunities presented. The understanding gained in this analysis set the framework for the development of the carbon management strategy in 2009 and updating of this carbon strategy beginning of 2011.

iii. Most important components of the short term strategy that have been influenced by climate change:

The Gold Fields Carbon Management Strategy, as drafted in 2009 consisted of 15 strategic initiatives. The eight initiatives required to be implemented on the short term by the strategy have been implemented by the end of 2010. These include:

1.) Make Carbon Strategy consistent with Gold Fields vision values and goal
2.) Modify other Gold Fields policies to match the carbon management strategy
3.) Ensure management buy-in
4.) Modify management and organisation structure to accommodate the carbon management strategy
5.) Install data capturing and reporting system
6.) Formalise carbon accounting procedures
7.) Install performance management system
8.) Climate change risk management system – Identification, quantification and mitigation of risks.

iv. Most important components of the long term strategy that have been influenced by climate change

The Gold Fields Carbon Management Strategy, as drafted in 2009 consisted of 15 strategic initiative. The 7 initiatives required to reposition the business of Gold Fields in the long term have been initiated by the end of 2010. These include:

1.) Climate change opportunity identification system - Identification and procedures to capitalise on opportunities
2.) Annual calculation of carbon footprint
3.) Modification of business profile and mining assets to match the climate risks and opportunities identified.
4.) Ongoing communication with all stakeholders, both internal and external
5.) Addressing employee perceptions and buy-in
6.) Managing the concerns of all stakeholders
7.) Do long term emissions planning

v. How this is gaining you strategic advantage over your competitors

Gold Fields competes in two markets. The first is in the gold market and the second the investment market for raising funds to mine gold. Gold Fields believes that a better understanding and closer management of the risks and opportunities presented by climate changes enables it to be more cost competitive and secure better mining assets than its competitors in the gold market. Gold Fields further believes that the leadership position it has secured in the climate change space by achieving a joint first place in the CDLI in 2010 and by winning the Energy Risk Deal of the Year Award for the Beatrix project, strengthens its 'social license to operate' and gives it a competitive advantage in the investment market to secure funds to open new mines.

vi. What are the most important business decisions made in 2010 influenced by the climate change driven aspects of the strategy?

The most important business decisions influenced by both the Carbon Management Strategy and by the success Gold Fields has achieved in the climate change space are:

1.) Evaluation (feasibility study) of possible duplication of the Beatrix Methane Capture Project at the Beatrix 4 Shaft. This project will generate in the order of 5 MW of power and earn in the order of 180,000 CERs per year
2.) Start with the registration process for the obtaining of carbon credits from the installation of a waste heat recovery system on the Beatrix power generators.
3.) Continuing with the feasibility study of the Driefontein Biomass to Energy project.

If no: **2.2b please explain why not**

Engagement with Policy Makers (CDP 2010 Q9.10-9.11)

2.3 Do you engage with policy makers to encourage further action on mitigation and/or adaptation?

Yes

If yes: **2.3a Please explain (i) the engagement process and (ii) actions you are advocating**

Gold Fields' engagement with policy makers takes place in response to public participation requests, as well as on Gold Fields' own initiative.

In **South Africa**, Gold Fields engages mainly with the following policy makers:

1- **Treasury:**
   On request of Gold Fields, a meeting was held between Treasury and Gold Fields to discuss the impact of carbon taxation on its business. Gold Fields explained the potential impact of carbon tax and advocated that clear price signals should be send to the market and carbon tax shouldn't be allowed to negatively impact Gold Fields global competitiveness.
2- **Eskom:**
   Gold Fields has representatives at different **forums** within Eskom. For example the head of electrical engineering engages with Eskom on **energy supply**, demand side management, energy efficiency and conversation. These forum meetings take place on a **monthly basis**. During these forums Gold Fields **advocates** the importance of supply security and proposes joint cooperation and action on energy efficiency projects to reduce Gold fields' electricity consumption and carbon intensity and help Eskom to secure supply.
3- **NERSA:**
   Gold Fields has **annual meetings** with NERSA, unless asked to join additional meetings. Engagement over the last years has focused on the topic of electricity **pricing regulations**. During those meetings Gold Fields advocates the REFIT tariff to be used to aid the implementation of renewable energy. Furthermore, Gold Fields advocated pricing regulations to be presented to the public as soon as possible, so that preparations for higher electricity prices can start well in advance. Gold Fields does not deal directly with the Department of Energy; this is done via NERSA.
4- **The Energy Intensive Users Group:**
   Gold Fields engages with the Energy Intensive Users Group via representation on the International Task Team for Global Climate Change. Meetings between the task team and EIUG are held on a quarterly basis. During those meetings Gold Fields advocates the carbon tax to be ring fenced and all income generated to be used for renewable energy projects. Furthermore Gold Fields promotes that clear price signals should be send to the market and carbon tax shouldn't be allowed to negatively impact its global competitiveness.

In **Ghana**, Gold Fields engages regularly with the Electric Company of Ghana and the Volta River Authority on energy consumption reduction initiatives. This is done in response to public participation requests, new policy development as well as on initiative of Gold Fields. Gold Fields advocates reasonable energy consumption reduction targets through implementation of energy efficient technology and waste recovery during these engagements.

Gold Fields **Australasia** plays an active role in working with local, state and federal bodies, in their effort to achieve carbon emission mitigation and climate change adaptation.

In November 2010 representatives from Gold Fields St Ives attended a **CSIRO1 Climate Adaptation for Resources Forum**. The forum stratified the findings associated with Climate Adaptation, the inherent risks that the Resources sector will be exposed to, and the mitigating

actions that may be undertaken to lessen or remove these risks. Gold Fields were instrumental in providing dialogue for surface and underground operations at its north eastern Gold Fields operations. Extreme weather events effecting mining campaigns, fuel supplies, electricity power supply infrastructure, soil erosion, process water supplies and human adaptability were amongst the few factors weighed in to the forum. The CSIRO in turn presented these findings to federal policy makers, a determining factor in the study and associated costs of Climate Change adaptability for the resources and mining sector.

Gold Fields has been instrumental in providing correspondence to the Department of Climate Change & Energy Efficiency (DCCEE), through the Energy Efficiency Opportunities (EEO) White Paper submission. Invited to comment after the first 5 year cycle of the EEO Program being completed, Gold Fields has and continues to maintain a solid relationship in proposed changes and progress of the EEO Program. The strengthening of this program provides a better indication to policy makers within the CCEE federal department. Gold Fields stoically supported the amalgamation of emission and energy reporting in line with the National Greenhouse & Energy Reporting scheme (NGER). Gold Fields also proposed or endorsed changes in:

- Baseline energy schedules, thresholds and reporting cycles
- Consistent terminology in climate change and energy reports
- Key performance and benchmarking indices that are uniform across industry and mined resources
- International Standard amalgamation into the EEO Program
- Key corporate reporting responses and affirmations

Gold Fields work with the CCEE and also the Department of Resources Energy & Tourism (DRET) is a key platform in progressing climate change understanding through reporting processes, and the resultant effects of carbon emissions to mining and general communities.

3. Targets and Initiatives

Targets (CDP 2010 Q9.2-9.6)

3.1 Did you have an emission reduction target that was active (ongoing or reached completion) in the reporting year?

You will need to select one of the following options:

- *Absolute target*
- *Intensity target*
- ***Absolute and intensity targets***
- *No*

Management

If you have an absolute target:

3.1a Please provide details of your absolute target

ID	Scope	% of emissions in scope	% reduction from base year	Base Year	Base Year emissions (metric tonnes CO_2-e)	Target Year	Comment
Aus1	Scope 1	22%	10%	2009	108,797	2015	A diesel fuel saving of 9.79% target, based on diesel usage projections (business as usual), has been set from 2010 to 2015. This diesel reduction will achieve approximately 10% CO2 emission reduction, on the basis that the energy mix stays the same. The energy mix may however change due to mining method constrains. If this should happen the CO2 target will be adjusted in the appropriate manner. The base year is listed as 2009 because the targets are set as reduction below the business as usual scenario. The base year will therefore be updated or restated every year to reflect the year of operation. The 10% emission reduction target (based on constant energy mix) is a total reduction target for the period 2010 to 2015 compared to business as usual.

ID	Scope	% of emissions in scope	% reduction from base year	Base Year	Base Year emissions (metric tonnes CO_2-e)	Target Year	Comment
Aus2	Scope 2	3.7%	5%	2009	132,998	2015	An electricity saving of 5.04% target, based on electricity usage projections (business as usual), has been set from 2010 to 2015. This electricity reduction will achieve approximately 5% CO2 emission reduction. The base year is listed as 2009 because the targets are set as reduction below the business as usual scenario. The base year will therefore be updated or restated every year to reflect the year of operation. The 5% emission reduction target is a total reduction target for the period 2010 to 2015 based on business as usual.

If it is an intensity target:

3.1b Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base Year	Base Year emissions (metric tonnes CO_2-e)	Target Year	Comment
Beatr	Other: Scope 1 & 2 excl. Mine	16.38%		Metric tonnes CO2e per ounce of gold mined	2009	2.22	2015	*Based on electricity saving targets of 3%/year between 2010-2015 and a diesel reduction target of 3% /year*

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base Year	Base Year emissions (metric tonnes CO_2-e)	Target Year	Comment
	methane							*between 2010-2015*
KDC West	Scope 1&2	31.49%		Metric tonnes CO2e per ounce of gold mined	2009	2.03	2015	*Based on electricity saving targets of 3%/year between 2010-2015 and a diesel reduction target of 3% /year between 2010-2015*
KDC East	Scope 1&2	31.94%		Metric tonnes CO2e per ounce of gold mined	2009	2.80	2015	*Based on electricity saving targets of 3%/year between 2010-2015 and a diesel reduction target of 3% /year between 2010-2015*
South	Scope 1&2	10.15%		Metric tonnes CO2e per ounce of gold mined	2009	2.08	2015	*Based on electricity saving targets of 3%/year between 2010-2015 and a diesel reduction target of 3% /year between 2010-2015*
Tarkw	Scope 1&2	4.14%		Metric tonnes CO2e per ounce of gold mined	2009	0.41	2012	Based on a yearly 2.5% diesel and electricity saving between 2010-2012
Daman	Scope 1&2	1.09%		Metric tonnes CO2e per ounce of gold mined	2009	0.32	2012	Based on a yearly 2.5% diesel and electricity saving between 2010-2012

3.1c Please also indicate what change in absolute emissions this intensity targets 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
Beatr	No Change	0%			Gold Fields has set targets for adjusted greenhouse gas intensity. These targets are calculated by taking ore grade and mining depth into account. It is expected that the unadjusted values will remain constant and therefore that the absolute scope 1 and 2 emissions of this operation will remain constant over time.
KDC West	No Change	0%			Gold Fields has set targets for adjusted greenhouse gas intensity. These targets are calculated by taking ore grade and mining depth into account. It is expected that the unadjusted values will remain constant and therefore that the absolute scope 1 and 2 emissions of this operation will remain constant over time.
KDC East	No Change	0%			Gold Fields has set targets for adjusted greenhouse gas intensity. These targets are calculated by

Management

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
					taking ore grade and mining depth into account. It is expected that the unadjusted values will remain constant and therefore that the absolute scope 1 and 2 emissions of this operation will remain constant over time.
South	No Change	0%			Gold Fields has set targets for adjusted greenhouse gas intensity. These targets are calculated by taking ore grade and mining depth into account. It is expected that the unadjusted values will remain constant and therefore that the absolute scope 1 and 2 emissions of this operation will remain constant over time.
Tarkw	No Change	0%			Gold Fields has set targets for adjusted greenhouse gas intensity. These targets are calculated by taking ore grade and mining depth into account. It is expected that the unadjusted values will remain constant and therefore that the absolute scope 1 and 2 emissions of

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
					this operation will remain constant over time.
Daman	No Change	0%			Gold Fields has set targets for adjusted greenhouse gas intensity. These targets are calculated by taking ore grade and mining depth into account. It is expected that the unadjusted values will remain constant and therefore that the absolute scope 1 and 2 emissions of this operation will remain constant over time.

For both types of target, also:

3.1d Please provide details on your progress against this target made in the reporting year

ID	% complete (time)	% complete (emissions)	Comment
Beatr	17%	100%	At Beatrix, the 2015 target has already been reached in 2010 and even surpassed with 14%.
KDCW	17%	0%	KDC West had a higher energy intensity in 2010 compared to 2009. Energy intensity increased at KDC West due to

			decreased mining activity. This is due to the fact that deep level gold mines have an energy overhead associated with pumping and ventilation that is independent of the amount of ore mined.
KDC East	17%	100%	At KDC East, the 2015 target has already been reached in 2010 and even surpassed with 17%.
South	17%	100%	At South Deep, the 2015 target has already been reached in 2010 and even surpassed with 23%.
Tarkw	33%	51%	At Tarkwa, 51% of the emission target has been reached at 33% of the time.
Daman	33%	0%	At Damang, no emission reductions compared to the 2009 base year have been reached (energy efficiency projects have been implemented, but operations expanded).
Aus1	17%	10%	In Australia, 10% of the Scope 1 target has been achieved at 17% of the time.
Aus2	17%	0%	Though electricity efficiency projects have been implemented at the operations in Australia, no progress has been made with the scope 2 emission targets.

If you do not have a target:

3.1e Please explain (i) why not; and (ii) forecast how your emissions will change over the next five years

Emission Reduction Initiatives (CDP 2010 Q9.7-9.9; Q16)

3.2 Does the use of your goods and/or services directly enable GHG emissions to be avoided by a third party?

No

If yes: **3.2a Please provide details (see guidance)**

3.3 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

If yes, complete questions 3.3a and 3.3b:

3.3a Please provide details in the table below

Activity Type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
Low carbon energy installation	**Driefontein Renewable Energy Project**: was initiated with a pre-feasibility study beginning of 2010. The project involves the growing of renewable fuels (either trees or grasslands) on the KDC West property and the use of this fuel to supply electricity to the mining operation. It integrates closely with the development of alternative post-closure land use options and offers the opportunity of phyto-remediation of contaminated land and polluted water. This project focuses on reducing scope 1 and 2 emissions as it will generate electricity. Normally, electricity is purchased from Eskom, but sometimes additional, or in the case of black-outs, the only source of electricity is from onsite diesel generators. So the project is also expected to reduce the use of diesel generators on site to produce electricity. This project is voluntary and originates from Gold Fields' desire to be a sustainable gold producer. After the extended pre-feasibility study was finalized beginning of 2011, it was decided to continue the project with a detailed feasibility study. It is expected that the feasibility study will commence in July 2011 and be finalized by the end of the year. Project			>3 years

Activity Type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
	implementation is planned after all necessary approvals are issued, probably in the second quarter of 2012. Once the project is implemented, the expected lifetime of the project is a minimum of 20 years.			
Fugitive emissions reduction	The **Beatrix 4 Shaft project** was initiated mid 2010. This project is a duplication of the Beatrix methane capture project. It consists of the capture of methane from the Beatrix 4 shaft and the use of the methane to generate approximately 5MW electricity. The project will reduce scope 1 greenhouse gas emissions from Beatrix by about 36% This project is voluntary and originates from Gold Fields' desire to be a sustainable gold producer. The project is now in its design phase and started with the CDM registration process. Once the project is implemented and maintenance is performed, it is expected that it will last till the end of mine, with a minimum of 20 years.			>3
Energy efficiency: processes	In the **Beatrix – heat recovery** project thermal energy will be captured from the engines using methane to generate electricity. This thermal energy will be used to replace coal that is currently burned to supply steam to the metallurgical plant and hot water to the ablution			>3

Activity Type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
	facilities. The captured thermal energy will be around 5 MW of thermal energy and replace approximately 5,500 tons of coal a year, which equals about 14,000tCO2/yr. By replacing on site used coal, the project reduces scope 1 emissions. This is a voluntary project, which is in its final design stage and which is expected to have a lifetime (when well maintained) equal to the minimum of life of mine.			
Energy efficiency: processes	In KDC East, KDC West, South Deep and Beatrix, **in-line fans** are planned to be implemented in order to reduce energy use compared to conventional fans. A total saving of 16.5MW is expected, which amounts in approximately 100,000 MWh or 100,000 tCO_2 reductions per year. This project is expected to reduce electricity use at those mines and therefore reduce scope 2 emissions. The feasibility investigations for this project took place in 2010 and is planned to be implemented in 2011. This is a voluntary project and originates from Gold Fields' desire to be a sustainable gold producer. The expected lifetime of the project equals, under good practice maintenance, at least the lifetime of the mine.			< 1 year
Energy Efficiency: processes	**KDC East #3 Ice plant**. Traditionally, chilled water is being put down the shaft to supply cooling to			1-3 year

Activity Type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
	underground workings. All water pumped down the shaft to supply chilling in this way must be pumped out of the mine again at a huge energy expense. This project entails the replacement of chilled water with ice. As the amount of energy carried down the shaft with ice is significantly more on a mass basis than water, the use of ice significantly reduces the amount of water that needs to be pumped out of the shaft again and thereby reduces the energy consumption of the mine. This project reduces approximately 53,000 tCO2 per year. This project is expected to reduce electricity use at KDC East and therefore reduce scope 2 emissions. This is a voluntary project, which is in project registration phase under CDM and which is expected to have a lifetime (when well maintained) which at least equals the life of mine.			
Energy Efficiency: processes	**KDC West Change-house heat pumps**. Traditionally water for the ablution facilities is heated by electrical resistance heaters (traditional geysers). In the project these will be replaced by heat pumps that will reduce the energy consumption of these installations by 2/3rd. The KDC West Change house heat pumps installation will reduce energy use with around 1.1 MW. This project is expected to reduce electricity use at KDC West and therefore reduce scope 2 emissions.			1-3 years

Activity Type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
	This is a voluntary project, which is in feasibility phase and which is expected to have a lifetime (when well maintained) which at least equals the life of mine.			
Energy Efficiency: processes	**KDC East 1# & KDC East 7# Optimisation of Air networks (HVACI).** This project is based on the integration of a number of breakthrough technologies with respect to the management and control of energy intensive compressed air networks. Implementation of these technologies will reduce the energy consumption of individual networks between 10 and 20%. The optimisation air networks installed at KDC East will replace around 3 MW of conventional air networks. This project will reduce electricity at KDC East and therefore reduce scope 2 emissions. This is a voluntary project, which is in final feasibility stage and which is expected to have a lifetime (when well maintained) which at least equals the life of mine.			1-3 years
Energy efficiency: processes	The **three Chamber Pipe Systems** project will be implemented to improve water pumping efficiency. Three chamber pipe feed systems are based on pressure recovery technology that allows the pressure of water being put down the shaft to be used to pump water from the shaft. The implementation of this technology leads to significant reduction of energy used in water			>3 years

Activity Type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
	pumping. These projects are ideal for shafts that are deeper than 1000 m. Typical savings for such projects is in the order of 10,000MWh/yr per installation. This project will reduce electricity at the shafts where it is implemented and therefore reduce scope 2 emissions. This is a voluntary project, which is in feasibility stage and which is expected to have a lifetime (when well maintained) which at least equals the life of mine.			
Energy efficiency: processes	Tarkwa (Ghana) **Process scheduling of North Plant**. Currently manual scheduling at the Tarkwa North plant is used. This is not optimal and energy efficiency can be improved through automatic scheduling. During low material throughput the secondary crusher, tertiary crusher and agglomeration plant will be scheduled to decrease their energy use. This project will save approximately 100 MWh per year. This project will reduce electricity at its processing plant and therefore reduce scope 2 emissions. This is a voluntary project. A feasibility study was conducted in 2010 after which it is projected to be implemented in 2011. The project will have a minimum			1-3 years

Activity Type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
	lifetime (when well maintained) of 20 years.			
Energy Efficiency: Building services	Damang (Ghana): **motion sensor control for air conditioners**. The purpose of this project is to reduce the amount of energy consumed by the air conditioner installed at both the plant and town sites in Damang by installing motion sensors into the power supply to each air conditioner. The sensor unit, with its own time delay will start up the air conditioner when the room is vacated or unoccupied for a preset period of time. The annual saving amounts to approximately 710 MWh. This project will reduce electricity and therefore reduce scope 2 emissions. This is a voluntary project. A feasibility study was conducted in 2010 after which it is projected to be implemented in 2011. The project will have a minimum lifetime (when well maintained) of 20 years.			1-3 years

Management

3.3b What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated budget for energy efficiency	
Other	**Combination of cost abatement through replacement of electricity together with an income generated from the sales of carbon credits. Both incomes streams are required to make the Driefontein renewable energy project economically viable.**

If no: **3.3c If you do not have any emission reduction incentives, please explain why not**

4. Communications (CDP 2010 Q22)

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

Publication	Page/Section reference	Identify the attachment
In annual reports (complete)	**Annual Report for the year ended 30 June 2010**: no 2010 specific GHG data was reported, as this report was published halfway 2010. Information on projects is provided on page 95. **Integrated Annual Report for the six months ended 31 December 2010**: pg 84-87	Attach: GF-1sthalf 2010_AR GF-2nd half 2010_AR
In voluntary communications (complete)	Methane Power in Mining Weekly	Methane Power in Mining Weekly
In voluntary communications (complete)	Energy Risk Award 06-2010	energy_risk_award_062010
In voluntary communications (complete)	Beatrix article in Mining Weekly	Beatrix article in Mining Weekly
In voluntary communications (complete)	25 degrees in Africa - Gold Fields to sell ZAR200-million of CERs in carbon trade deal	25 degrees in Africa - Gold Fields to sell ZAR200-million of CERs in carbon trade deal

Comment:

'*Fugitive mine methane emissions were not included in the Scope 1, Scope 2 and Scope 3 emissions total, reported on page 84 of the Integrated Annual Report for the six months ended 31 December 2010. An increase of 15% between the total reported in the Integrated Annual Report compared to the total of the Scope 1, Scope 2 and Scope 3 emissions reported in the CDP Report, was noted, due to the following reasons:*

- *Inclusion of fugitive mine methane;*
- *Update on the electricity emission factor for the Australian sites;*
- *Update on the coal calorific value;*
- *Update on blasting agents data;*
- *Changes to the Scope 3 emissions which were previously not assured for the full calendar period.'*

5. Climate Change Risk (CDP 2010 3-5)

5.1 Have you identified any climate change risks (current or future) that have the potential to generate a substantive change in your business operations, revenue or expenditure? Please identify the relevant categories:

☒ **Risks driven by regulation**
☒ **Risks driven by changes in physical climate parameter**
☒ **Risks driven by changes in other climate-related developments**

Risks & Opportunities

5.1a Please describe your risks driven by changes in regulation

ID	Risk Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
Int	International agreements	Countries/regions like Europe may impose life cycle greenhouse gas taxes on their borders to level the greenhouse gas emission reduction playing field in the absence of international agreements. The possibility of **border tax adjustments** in the absence of a Kyoto protocol follow-up may impact on the selling price of gold into regulated markets. At a gold price of $1,500 and with Gold Fields' carbon intensity this would have a price increase impact ranging from as low as 0.2% on the case of Cerro Corona to 2.4% in the case of Beatrix.	Other: reduced net revenue per ounce of gold sold	1-5 years	Direct	About as likely than not	Low
SA	Carbon taxes	In December 2010, the South African Government published a discussion paper open for public comment on the carbon tax option to reduce Greenhouse Gas Emissions. The discussion paper mentions a carbon tax based on measured and verified emissions to be preferred, although a proxy tax base based on the carbon content of fuel inputs could be considered. Taxes between R75-R200 per tonne of CO_2 are indicated to be considered appropriate.	Increased operation costs	1-5 years	Direct	More likely than not	Medium

ID	Risk Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
		Gold Fields has modelled the potential financial impact of the carbon tax on its operational costs. Operation costs were found to increase between 2.5 and 4.5% for the different operations, when assuming a carbon tax of R75/tonne CO_2.					
Aus	Cap and Trade schemes	The Australian regulatory framework consists of a reporting mechanism (The National Greenhouse and Energy Reporting Act 2007 (NGER)) and a cap and trade system (the Carbon Pollution Reduction Scheme (CPRS)). The implementation of the CPRS has been delayed until after 2012. It is unknown when the cap and trade scheme will be implemented and what the details of the scheme will be. This scheme, once implemented poses the risk to Gold Fields of increased operational costs.	Increased operational costs.	1-5 years	Direct	About as likely as not	Low-Medium

5.1b Please describe (i) the potential financial implications of risk before taking action; (ii) the methods you are using to manage this risk and (iii) the costs associated with these actions

ID: Int (International agreements: border tax adjustment)

(i) Potential financial implications of risk before taking action:

In the absence of a follow up agreement of the Kyoto protocol or other international agreements, regions like Europe could decide to implement border tax adjustments to level the greenhouse gas emission reduction playing field.

Gold Fields has calculated the potential financial impact of **border tax adjustments** on its product. Using Europe as an example and assuming a 2012 carbon price of Euro 15 per ton and a 20% reduction target, such a tax will increase the current cost base by the following percentages:

• Beatrix	2.4%
• KDC West	1.2%
• KDC East	1.8%
• South Deep	1.0%
• Tarkwa	0.3%
• Damang	0.2%
• St Ives	0.2%
• Agnew	0.2%
• Cerro Corona	0.2%
Total Gold Fields Production	**1.8%**

(ii) The methods you are using to manage this risk:

Gold Fields is putting in substantial effort to reduce carbon emissions, even without clear international commitments. Through reduction of emissions the impact of a potential border tax is currently managed. Over the last years, energy intensity of the group was reduced from 1.53 tCO2/ounce of gold in 2008, to 1.38 tCO2/ounce of gold in 2009 and 1.30 tCO2/ounce of gold in 2010. This decrease in energy intensity is due to the implementation of energy efficiency projects. Furthermore, methane emissions will be reduced through the implementation of methane capture projects in South Africa. Although emissions are reduced through energy efficiency projects and investigations into renewable energy sources have started, there are aspects of the mining operations that cannot be controlled; reduced ore grade and increased mining depth increase the energy intensity of gold outside the control of Gold Fields.

In Ghana, Gold Fields has entered into an agreement with an Independent Power Producer to perform a feasibility study for the generation of 8 MW of power from sustainable biomass. Furthermore, Powertech IST was employed to assess energy efficiency possibilities at Tarkwa and Damang.

In Australia, the progress on energy efficiency projects has been greatly assisted by the appointment of energy officers at both St Ives and Agnew. In 2010, six energy efficiency projects were completed, which reduced total emissions with 166tCO_2/yr. Furthermore, 2 projects were commenced with a total potential to save 608tCO_2/yr.

As an example, the implementation of the Beatrix and Beatrix 4 Shaft Methane capture projects will reduce the carbon intensity of Beatrix from 3.95 tons of CO_2e per ounce to 1.9 tons per ounce, a reduction of 48%. The impact of possible border tax adjustments reduces from 3.2% of Beatrix cost to 1.6%.

(iii) The costs associated with these actions

The cost of the Beatrix methane capture project is R82 million and of the Beatrix 4 Shaft methane capture project is R70 million.

The cost of the renewable energy feasibility study in Ghana is carried by the Independent Power Producer. The cost of implementing the energy efficiency projects at Tarkwa will be R43.8 million and those at Damang will be R965,000.

The six completed projects in Australia had a total cost of approximately R546,000. The two projects that were commenced in 2010 are forecasted to cost R4.4 million once completed.

The total cost of Gold Fields GHG mitigation projects, ranging from projects in feasibility stage to projects in execution stage is more than R500 million.

ID: SA (carbon tax)

(i) Potential financial implications of risk before taking action

Gold Fields has modelled the potential impact of a carbon tax on their operations. For this purpose a carbon tax of ZAR 75 per ton of CO_2 on Scope 1 and 2 emissions was assumed. Fugitive mine methane emissions have been excluded from this calculation as it is believed that it would not be practical to tax such emissions due to the lack of accurate measurement protocols and systems. The impact on Gold Fields cost base would be:

- Beatrix 3.1%
- KDC West 3.3%
- KDC East 4.7%
- South Deep 2.7%

(ii) The methods you are using to manage this risk:

Gold Fields is managing the carbon tax risk by trying to achieve behavioural change to effect more efficient operations and through the implementation of capital projects. The behavioural change is managed by including energy efficiency targets in the score cards of managers and thereby linking their bonuses and increases to the repositioning of the business. The projects include *inter alia*:

- Beatrix Methane Capture
- Beatrix 4 Shaft Methane Capture
- KDC East Hard Ice Project
- Energy efficiency projects on ventilation system, water pumping, compressed air systems and others. Gold Fields has a list of 18 energy efficiency projects, with a total capital cost of R345 million that will reduce the emissions of the group by approximately 380,000 tCO2/yr.
- Renewable energy projects: a feasibility study into a 5MW renewable energy project at KDC was initiated in 2010 and continued in 2011.

(iii) The costs associated with these actions

- Beatrix methane project. This project will generate up to 4 MW of power from mine methane and will cost R82 million.
- KDC East Hard ice plants. This project will cost R80 million and reduce energy consumption at KDC East by 53 GWhr per year
- The total cost of all the emission reduction projects is more than ZAR 500 million.

ID: Aus (Cap and Trade Schemes)

(i) Potential financial implications of risk before taking action

There is much uncertainty about the cost of carbon under the CPRS. With Gold Fields Australian carbon footprint in the order of 233,000 tons, a cost of carbon of AUD 10 per ton of CO_2e equates to an additional tax burden of R16.4 million. As Gold Fields Australian operations produce in the order of 620,000 ounces of gold per year, this additional cost burden equates to around R27.5 per ounce. This would increase Gold Fields' total cost of production in Australia by around by around 0.5%. If the carbon cost goes up to AUD 40 per ton, this increases to an impact of 1.7% on its total cost of production. These figures will come down if Gold Fields qualify for either the Emissions-Intensive Trade-Exposed industry assistance (EITE) or for the Transitional Electricity Cost Assistance Program (TECAP). The impact of the CPRS can further be reduced through the use of Obligation Transfer Numbers (OTN) for the diesel purchased, through energy efficiency projects and through the use of CERs generated in our operations in non-Annex I countries.

(ii) The methods you are using to manage this risk

Gold Fields Australasia is currently managing the risk of a carbon cap and trade scheme in two ways; firstly energy efficiency projects are implemented to reduce carbon emissions. Secondly, preparations are made to be ready if the cap and trade scheme is indeed accepted and implemented. Gold Fields Australasia is a member of the Australia Gold Production Industry (AGPI). AGPI commissioned the services of Ernst & Young, a firm specialising globally in Assurance, Tax, Transactions and Advisory services. Ernst & Young were scoped to correlate and complete analysis on the EITE framework and thereby be in a position to estimate whether the emissions intensity of the gold production process exceeded the thresholds for receiving EITE assistance.

(iii) The costs associated with these actions

- Energy efficiency projects: R546,000 for the projects finished in 2010
- Services of Ernst & Young were obtained through Gold Fields' membership of AGPI.

Risks & Opportunities

5.1c Please describe your risks driven by change in physical climate parameters

ID	Risk Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
1	Change in precipitation extremes and droughts	Gold Fields has contracted Climate Risk Management (Pty) Ltd who are climate modelling experts to assess the potential impact of climate change on its operations. Their report was published in April 2010 and show increased rainfall variability at several Gold Fields operations. At the South African West Rand and Beatrix operations, maximum recorded rainfall shows statistically significant increase. Furthermore, floods in Ghana disrupted production. This result, taken together with the decrease in mean precipitation suggest that whilst area average rainfall may be decreasing, isolated maximum intensities and hence localized storms within the area are increasing, leading to an **increase in the risk of flash floods**. More extreme storms increase the risk of mine flooding and increased water levels in tailings dams, which in turn could impact on tailings dam stability. At Tarkwa production days were lost during the 2010 rain events when it was too dangerous to	**Reduction or disruption in production capacity**, Increased costs and safety impacts	Current	Direct	Likely	Medium

ID	Risk Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
		operate heavy equipment. Gold Fields Tarkwa lost an average of 2 x 12 hour shifts per month booked as weather delays, mostly due to rain and fog.					
2	Higher temperatures	Gold Fields has contracted Climate Risk Management (Pty) Ltd who are climate modelling experts to assess the potential impact of climate change on its operations. Their report was published in April 2010 and show statistically significant increases in temperatures at most of the Gold Fields operations. Historical studies have shown significant correlation between work place temperatures and productivity on Gold Fields operations. Higher ambient temperatures impacts Gold Fields' operations in 2 ways. The first is direct impacts; when temperatures pass a certain limit, work is disrupted. The second impact is indirect through the performance of the chilling plants used to cool down the underground workings; the higher the temperature, the more cooling and therefore energy is required.	Reduction/disruption in production capacity & **Increased operational costs**	Current	Direct	Likely	Low

5.1d Please describe (i) the potential financial implications of risk before taking action; (ii) the methods you are using to manage this risk and (iii) the costs associated with these actions

i. **the potential financial implications of risk before taking action;**
ii. **the methods you are using to manage this risk and**
iii. **the costs associated with these actions**

(1) **Change in precipitation extremes and droughts.**

1. Potential financial implication:

Up to fairly recently the disruption of mining production by extreme weather events was not a common occurrence. In recent years a number of our peers have been impacted by such events. Examples are Anglo Platinum (Amandelbult shaft flooded) and Kumba Iron Ore (26% reduction in output in first quarter of 2011 due to heavy rain).

At Gold Fields Tarkwa production days were lost during the 2010 rain events when it was too dangerous to operate heavy equipment. Gold Fields Tarkwa lost an average of 2 x 12 hour shifts per month booked as weather delays, mostly due to rain and fog. The only area that was inaccessible during this time was the stage 3 area of Teberebie pit. Operations are planned to work higher level pits in the wet season knowing that the lower parts will be flooded. At Tarkwa, the deeper pits contain higher grade material, therefore there was a 0.2g/t drop in grade over October and November 2010 as the deeper pits could not be mined. The total deliverable tonnes were not affected.

It was calculated that in Ghana, an average revenue of R1,457,456 per shift was produced. Per shift missed, the cost implications can therefore be estimated to be around R1.5 million. In South Africa, average revenue per shift is R7.6 million. Therefore the costs implication of missed shifts due to extreme weather events is approximately R7.6 million per shift.

Gold Fields has assessed all of its operations for rainfall variability related vulnerabilities and is satisfied that the most obvious risks have been addressed. Should Gold Fields however have a reduction of output due to extreme weather events, it will translate into an increase in cash cost for the period under consideration.

2. The following methods are adapted to manage this risk:

To adapt and manage risks, all operations are subjected to risk analysis on a regular basis. The risk registers are reviewed on a quarterly basis as part of the normal operational reviews and assessed on a 6 monthly basis by the Executive Committee and

the Board in terms of applicability and effectiveness. A scenario study, to qualify and quantify the uncertain physical risks associated with climate change has been undertaken as part of the carbon management strategy. Furthermore, flooding risks have been adapted to by the following actions:

- Increased pumping capacity has been installed in 2010 in Ghana
- Investigations into the potential of a centralized tailing storage facility in South Africa have been initiated. This centralized tailing storage facility will be designed to withstand 1 in 200 year rainfall events. A pre-feasibility study has been finished in 2010 and a detailed phased approach feasibility study has been commenced beginning of 2011.

3. Costing of the above:
    - Gold Fields Tarkwa purchased an additional 6 high lift pumps and accessories at a total cost of R16 million. This was to facilitate the deeper pits and the introduction of 2 stages pumping due to increase in pumping head. This adaptation will enable the mine to withstand increased rainfall variability and thereby flooding.
    - The total budget for the Phased Approach Feasibility Study of the centralized tailing storage is forecast to be R60.54 million.

(2) Change in mean (average) temperature

i. Potential financial implications:

Research has shown that a 1 degree increase in work place temperature of underground mines decreases productivity by as much as 17%. Such a decrease impacts directly on the revenue. It is estimated that a one degree increase in temperature and an associated 17% reduction in productivity would reduce the revenue.

ii. The following methods are adapted to manage this risk:

The design parameters of all the chilling plants have been changed and are now based on the results obtained from the climate change risk study done for Gold Fields by Climate Risk Management (Pty) Ltd. The chilling plants at the following mines are being upgraded:

(i) Beatrix
(ii) KDC East and West
(iii) South Deep

iii. Costs of this:

The total cost of upgrading of all chilling plants at the South African operations as part of the climate change adaptation strategy is found to be approximately R1 billion per degree upgrade.

5.1e Please describe your risks that are driven by changes in other climate-related developments

ID	Risk Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
1	Other: supply chain risks	Climate change will have a direct impact on Gold Fields' supply chain. Gold Fields uses various materials like steel, timber, cement and chemical reagents in its operations. All of these materials come from industries that are vulnerable to climate change and might have to increase their prices due to carbon tax, to mitigate climate change associated risks or other carbon pricing mechanisms. Higher operational costs will reduce the company's profit margin. When the profit margin has been reduced to a critical point, expenses on social projects/investments will be reduced, which will cause wider social disadvantages.	**Increased operational costs** & Wider social disadvantages	1-5 years	Indirect	About as likely as not	Medium-high
2	Other: Unknown risks	Unknown climate change risks present a discontinuity in the way Gold Fields does business. Historically, Gold Fields planned its business on projecting from the past experiences. This can no longer be done. The biggest other risk Gold Fields is exposed	Other: The potential impact of the unknown risks cannot be assessed other than to realise that it may cause discontinuities in the way the	Current	**Direct** and Indirect	Unknown	Unknown

ID	Risk Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
		to is the uncertainty related to the rapid change that climate change will bring in the environment in which it operates. When one understands a risk it is possible to manage, mitigate and/or insure the risk. When one does not understand the risk it becomes very difficult to do this.	company does business.				
3	Other: Social Risks	As the impacts of climate change becomes more apparent, social perceptions about issues surrounding climate change will also change. Gold Fields will be at risk if it does not anticipate these changes and move with them. Damage to relationships with Gold Fields stakeholders can impact on the ability of the company to do responsible and profitable business. Gold Fields takes its "Social License to Operate" very seriously. It values the support of all stakeholders ranging from the communities it operates in, and its personnel all the way through to its	Other: the potential impact of this is that Gold Fields may lose its social license to operate	Current	Direct	Unlikely	High

ID	Risk Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
		shareholders. Should the effects of, or perceptions around climate change affect the relationship it has with any of its stakeholders, it can potentially impact on its ability to conduct its business in a responsible and profitable way.					

5.1f Please describe (i) the potential financial implications of risk before taking action; (ii) the methods you are using to manage this risk and (iii) the costs associated with these actions

1. Other: Supply Chain Risks

(i) the potential financial implications of risk before taking action;

Some of the supply chain products being at risk include timber (fire vulnerability), cement (carbon tax vulnerability), steel (carbon tax and logistical vulnerability), and chemical reagents (carbon tax and logistical vulnerability). Non energy material bought through Gold Fields' supply chain represents 25-50% of Gold Fields' total operating cost. It is estimated that the prices in Gold Fields' supply chain could be increased by up to 1% due to the pricing of carbon into the economy. Should this happen, it could increase Gold Fields' cost base by around 0.25-0.5%

(ii) The methods you are using to manage this risk:

Through the disclosure of emissions, suppliers can be compared on their carbon performance. Gold Fields is implementing a system whereby suppliers are requested as part of the standard conditions of contract to disclose the life cycle emissions of the products supplied. It is only once this system is fully operational that this risk can be managed through preference of suppliers with low product life cycle emissions.

(iii) the costs associated with these actions

The cost of implementation of the system that requires suppliers to disclose the carbon footprint of their products is minimal and managed in-house; therefore no exact costing is available.

1. Unknown risks

i. the potential financial implications of risk before taking action;

Gold Fields recognises that unknown risks can significantly impact on its operations and business; exact financial implications are not available as the risks are unknown.

ii. The methods you are using to manage this risk:

The Carbon Management Strategy is integrated with the Risk Management Strategy in a way that constantly scrutinises all the aspects of Gold Fields' business for new risks. This risk evaluation is done regularly and under responsibility of an executive board member.

iii. the costs associated with these actions

The exact cost of the risk management system is unavailable as this is managed in-house.

2. Other: Social Risks

(i) The potential financial implications of risk before taking action;

If Gold Fields loses its social license to operate it may severely impact on production at its different mines. Gold Fields has observed in areas where it operates around the world that a breakdown with the relationships with local communities can lead to significant production losses; several competitors lose operation days on a regular basis due to local community strikes. If Gold Fields would lose its social license to operate at any time, it would results in losses of between R1.5 million in Ghana to R7.6 million in South Africa per shift missed.

(ii) The methods you are using to manage this risk:

New systems are continuously designed and implemented to address social and community concerns. This includes, but is not limited to factors covered by sustainability policy. The first priority is stakeholder engagement to be aware of concerns and communicate effectively. Gold Fields is guided in this approach by the internationally used AA 1000 Stakeholder Engagement Standard. Furthermore, communities receive additional benefits from the mines through corporate social development programmes. The following are examples of corporate social investment spending by Gold Fields; building of schools, provision of scholarships and small business support.

(iii) the costs associated with these actions

The costs of stakeholder engagement are integrated into the day to day operation of the business. Total CSI spending in 2010 by Gold Fields was R128 million.

6. Climate Change Opportunities (CDP 2010 6-8)

6.1 Have you identified any climate change opportunities (current or future) that have the potential to generate a substantive change in your business operations, revenue or expenditure? Please identify the relevant categories:

☒ **Opportunities driven by regulation**
Opportunities driven by changes in physical climate parameter
☒ **Opportunities driven by changes in other climate-related developments**

Risks & Opportunities

6.1a Please describe your opportunities driven by changes in regulation

ID	Opportunity Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
SA1	Carbon credits	Gold Fields has two CDM projects that are in the validation stage; The Capture and Utilisation of Methane at the Gold Fields' owned Beatrix Mine in South Africa, as well as the KDC East #3 Ice Chiller project. The Beatrix project will capture and destroy methane gas emissions from the Beatrix mine in South Africa and generate 4 MW of electricity (approximately 4% of the mine's electrical demand). The KDC East project employs hard ice technology that has not been implemented in South Africa as yet. These 2 projects will reduce our greenhouse gas emissions by around 6%. Other projects in the pipeline include: • Waste heat recovery project. A project to recover waste heat is being developed. • Replication of the Beatrix project at	Increased stock price – an increase in the attractiveness of your organization to investors	Current	Direct	Very likely	Medium

ID	Opportunity Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
		the Beatrix 4 Shaft • Gold Fields is proceeding with a detailed feasibility study of a renewable energy project at KDC West that will generate 5 MW in the first phase but has the opportunity to generate up to 50 MW in later phases. • 8 MW renewable energy project in Ghana.					
SA 2&3	Demand Side Management and tax incentives	Gold Fields has a number of energy efficiency projects that will benefit from both the Demand Side Management project run by Eskom and the tax incentives announced for energy efficiency projects. These include projects such as: 1. Three Chamber Pipe Systems to improve water pumping efficiency 2. Optimisation of Air and Water Networks 3. Thermal Ice Storage 4. Lighting and Air-conditioning	Investment opportunities – opportunities to make capital investments	Current	Direct	Very likely	Medium

Risks & Opportunities

ID	Opportunity Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
		5. Solar Water Heating in company houses					

6.1b Please describe (i) the potential financial implications of the opportunity before taking action; (ii) the methods you are using to manage this opportunity and (iii) the costs associated with these actions

SA1: Carbon credits

i. Potential financial implication:

The net present value of the Emission Reduction Purchase Agreement signed between Gold Fields and Mercuria in May 2010 to sell the expected 250,000 CERs per year for the first crediting period of the Beatrix project has a value in the order of R200 million, or 1.2% of the operational cost of the mine. In addition to the carbon credit revenue it is estimated that the project will deliver its 5 MW of electricity cheaper than the Eskom power once the next round of the Multi Year Price Determination of National Energy Regulator of South Africa is published. Gold Fields won the European Energy Risk Deal of the Year Award for this transaction.

Replication of the Beatrix project at Beatrix 4 Shaft will have similar financial implications as the Beatrix project.

The KDC East Hard Ice project will earn 53,000 CERS and this will be bought by Mitsubishi of Japan and will contribute 0.2% of the operational cost of the mine.

The CERs generated by the other projects will be:

- Waste heat recovery – 14,000 CERs per year - at the current market price of R120 per CER, this represents a value of around R1,680,000 per year
- Driefontein Renewable Energy Project – 50,000 CERs per year – at the current market price of R120 per CER, this represents a value of around R6 million per year
- Ghana Renewable Energy Project – 20,000 CERs per year - at the current market price of R120 per CER, this represents a value of around R2.4 million per year

ii. Methods used to manage the opportunity:

Gold Fields has effectively communicated with all its employees that carbon credit projects are seen as a priority to reduce carbon emissions and should be developed where possible. The management of the carbon credit projects is overseen by the Carbon Management Steering Committee. Delivery of the CDM projects are included in the score cards of the managers responsible for these opportunities. Successful delivery of the projects will impact directly on both their bonuses and increases. Currently, 2 projects are in validation, while several projects are in the process of development or feasibility phase. The projects in validation process are Beatrix project, as well as the KDC East #3 Ice Chiller project. The Beatrix project will capture and destroy methane gas emissions from the Beatrix mine in South Africa and generate 4 MW of electricity (approximately 4% of the mine's electrical demand). The KDC East project employs hard ice technology that has not

been implemented in South Africa as yet. These 2 projects will reduce our greenhouse gas emissions by around 6%.

iii. Costs of these methods:

The capital costs of these projects are:

- Beatrix Methane Capture – R 82 million
- Beatrix 4 Shaft – R70 million
- KDC East Hard Ice Plant – R80 million

SA2&3: Demand Side Management and tax incentives

i. Potential financial implication:

With respect to DSM in South Africa, Eskom funds up to 50% of the capital for energy efficiency projects and 100% of the capital for all load shift projects. The total potential of Eskom available funding through this scheme is R260 million for the projects Gold Fields currently have on its books.

With respect to tax (section 12L (allowance for energy efficiency savings) & section 12K (exemption of certified emission reductions from taxation) of the income tax act), the following financial implications have been calculated:

- The Beatrix methane project emission reduction purchase agreement with Mercuria has been valued with a NPV of R200 million. Under normal company taxation this revenue would have carried a tax bill of R56 million. Under section 12K this tax is saved.

- Gold Fields also applied section 12L (Allowance for energy efficiency savings) to the Driefontein Renewable Energy project. By utilising the tax benefit, the project generates a NPV of R352 million, whereas it would only be valued at a NPV of R300 million without that tax benefit.

ii. Methods used to manage the opportunity:

The financial opportunities presented through DSM and tax incentives can only be harvested through the implementation of appropriate projects. For this reason, Gold Fields identified and started implementation of several energy efficiency projects and is looking into a biomass renewable energy project in South Africa.

iii. Costs of these methods:

Eskom's Demand Side Management incentive scheme pays up to 50% of the capital cost of an energy efficiency projects and 100% of the capital cost of load shift projects. The capital costs of the projects are:

- KDC East #1 and #7 Optimisation of Air and Water Networks – R27 million of which R12.5 million is funded with DSM
- KDC East 3 Ice plant – R75 million of which R53 million is funded with DSM
- KDC West Change-house heat pumps – R12.9 million of which R3.8 million is funded with DSM
- In KDC East, KDC West, South Deep and Beatrix, in-line fans – R110 million of which R87 million is funded with DSM

The Driefontein Renewable energy pre-feasibility study costs were approximately R350, 000. The feasibility study costs are estimated to be around R2.5 million.

6.1c Please describe the opportunities that are driven by changes in physical climate parameters

Physical climate parameters that can potentially impact Gold Fields' operations are; temperature, water supply (rainfall dependant), atmospheric moisture conditions (dust generation and industrial cooling). The impacts of these physical climate parameters are defined to be the following in the context of Gold Fields specific operations;

- increasing **temperature** is a risk as it reduces productivity and increases chilling costs,
- decreasing temperature is an opportunity as it increases productivity and reduces underground chilling costs
    - based on climate change theory and temperature measurements at Gold Fields' operations, it's more likely that temperatures are increasing and therefore this changing physical parameter is a risk
- Increasing **variability in rainfall** is a risk to the gold mining industry as it increases the probability of flooding and in general makes on-site water management more difficult.
- A decrease in variability in rainfall presents a water security opportunity
    - All indications imply that variability in rainfall increase instead of decrease; therefore there is no opportunity in this changing physical parameter.
- Reduction in **atmospheric moisture** will have both positive and negative impacts; positive impacts relate to increased performance efficiency of the cooling and chilling points. This opportunity is however offset by increased ambient temperatures and therefore not considered a real opportunity. The risk associated with a reduction in atmospheric moisture relates to increased dust generation in all surface operations.
- Increase in atmospheric moisture
    - It is more likely that atmospheric moisture will decrease than increase, thereby creating a risk. It is furthermore, more likely that the variation in atmospheric moisture will increase than that it will stabilize; thereby introducing operational uncertainty and increased risk.
- The impact of an increase or decrease of total annual **rainfall** is highly dependent on the climate at the specific operations. Climate change is associated with creating dryer conditions in already dry areas and wetter conditions in already wet areas. Furthermore, a change in total annual rainfall would come with more variability in rainfall which is a risk as flood management becomes more difficult. Therefore this changing physical climate parameter is seen as a risk and not an opportunity.

The impact of the above mentioned changing physical climate parameters on operations have been considered. At first it was thought that a reduction in atmospheric moisture could increase **cooling and chilling performance**. Unfortunately this risk is offset by increased ambient temperatures associated with reduced atmospheric moisture. Increased temperatures decrease productivity strongly and therefore require a chilling or cooling offset.

A reduction in total annual and variability of rainfall and increased atmospheric condition stability would enhance **mine rehabilitation** performance, whereas an increase in variability of these two parameters will impact negatively on mine rehabilitation. It is more likely that the variability will increase than decrease and therefore there are no opportunities in changes in these physical parameters.

The assessment of physical risks and opportunities formed part of the study performed for Gold Fields by Climate Risk Management (Pty) Ltd. This study is based on extrapolation of actual weather data of the 1960 to 2009 period. These projections carry uncertainties but have been extrapolated for at least 10 years.

The physical climate change and risk assessment done by Climate Risk Management (Pty) Ltd cover the South African operations. This exercise will be repeated for the other regions. Less formal estimates of physical climate change impact have been done for the international regions.

6.1d Please describe (i) the potential financial implications of the opportunity before taking action; (ii) the methods you are using to manage this opportunity and (iii) the costs associated with these actions

N.A.

6.1e Please describe the opportunities that are driven by changes in other climate-related developments

ID	Opportunity Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
1	Reputation	Gold Fields leadership in climate change and sustainable gold mining gives it a competitive advantage over peers with respect to securing of new mining opportunities. A good reputation, based on sustainable operations, gives Gold Fields a 'social licence to operate' and in that way creates investment opportunities.	Investment opportunities	1 – 5 yrs	Indirect	About as likely as not	Medium
2	Changing consumer behaviour	Gold as a Safe Haven: In 2010 it was reported that "Gold is seen as a safe investment; being used to hedge against turmoil. Sales of gold could increase if climate change were to create economic, political or social unrest." Whereas it is impossible to link the increase in gold price over the last year to the failure of the world to come to an agreement in Cancun, the lack of clarity in the carbon regulatory environment does add to the uncertain state of the world economy and could in a small way have a positive impact on the price of gold.	Increased demand for existing products	1-5 years	Indirect	About as likely as not	Unknown

ID	Opportunity Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
3	Other: new market opportunities	Irrespective of the nuclear incident in Japan, nuclear energy is still one of the most considered options for low carbon electricity supply in the future. Gold Fields has an opportunity to mine uranium as it has an excess of 50 million pounds of uranium contained in historical tailings dams across KDC West, KDC East and South Deep mines in South Africa. In addition, at KDC West alone, Gold Fields has in excess of 14 million pounds of uranium contained in tailings from current and future mining horizons. Work has already begun to determine how best to unlock the value inherent in these resources.	New products/business services	1-5 years	Direct	More likely than not	Medium-High
4	Other: new market opportunities	There is a possibility that the development of clean technologies will open up a new market for gold. Gold alloy catalysts are being investigated as an alternative to expensive platinum within the fuel cell stack	Increased demand for existing product	6-10 years	Indirect	About as likely as not	Medium

ID	Opportunity Driver	Description	Potential Impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
		and catalytic converters. Nanostellar, in partnership with the World Gold Council, developed a catalyst called NS Gold(TM); which is made of gold, platinum and palladium. This catalyst has the potential to reduce noxious emissions by about 20% more than traditional platinum catalysts.					

6.1f Please describe (i) the potential financial implications of the opportunity before taking action; (ii) the methods you are using to manage this opportunity and (iii) the costs associated with these actions

1) Reputation:

The potential financial implication of this opportunity lies in the possibility to grow the business as is the stated intend of Gold Fields. Gold Fields believes that its responsible behaviour in the climate change and sustainable mining space offers a competitive advantage against its peers that may result in Gold Fields obtaining to lucrative opportunities that it may not have had access to under normal circumstances. The exact financial implication will depend on each individual opportunity.

This opportunity is managed by diligently communicating in an open and transparent way Gold Fields efforts (both successes and failures) to all stakeholders.

Costs of managing this opportunity are integrated into Gold Fields' normal operating costs and are accounted for as part of its business as usual.

2) Gold as a Safe Haven:

The financial implication of this opportunity lies in a positive influence on the price of gold. Long term trends show a correlation between gold and energy prices. It is generally accepted that the move to a low carbon economy will put upward pressure on energy prices and it is expected that gold will follow this trend. This trend could be enhanced by global socio economic uncertainty that may result from uncertainty in the post Kyoto period.

This opportunity is not actively managed by Gold Fields as gold mining companies are price takers in the gold market. Therefore there are no costs associated with the management of this opportunity.

3) Development of the Uranium Market:

Gold Fields sees the development of the uranium project as a significant expansion opportunity and additional source of revenue for its business. This business will have the added effect of enhancing Gold Fields' rehabilitation efforts on the West Rand. The project was discussed at board level on the 25th of March 2010 and recommended a detailed feasibility study, which is proceeding according to plan.

Assuming that 50% of the Uranium content of current tailings could be extracted and sold (64 million pounds) at a price of R330 per pound, this would create an additional income stream of approximately R12.5 billion. This excludes the Uranium contained in the mines.

This opportunity is managed by performing a detailed feasibility study which will include recommendations on design and recovery practices.

The cost of this detailed feasibility study is R60.5 million.

4) New Industrial Applications for Gold:

The potential financial implication of this opportunity is that the price of gold may increase due to increased demand for gold for usage in new industrial applications. Any increase in the price of gold will directly impact on Gold Fields financial performance. It is unfortunately not possible to quantify what the impact on the gold price could be, but it is more likely that the price will increase than decrease. Additional revenue streams will impact directly on its profitability.

This opportunity is managed through Gold Fields' involvement with the World Gold Council. The World Gold Council supports the development of new, gold using, industrial applications, such as gold catalysts.

The cost of managing this opportunity is included in Gold Fields' annual fees to the World Gold Council.

7. Emissions Methodology

Base Year (New for CDP 2011)

7.1 Please provide your base year and base year emissions (Scope 1 and 2)

Base Year	Scope 1 Base year emissions (metric tonnes CO2e)	Scope 2 Base year emissions (metric tonnes CO2e)
2007	**1,283,364**	**5,226,770**

Methodology (CDP 2010 Q11)

7.2 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

ISO 14064-1
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

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

Gas	Reference
Methane	IPCC Third Assessment Report (TAR – 100 year)

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

Fuel/Material/Energy	Emission Factor	Unit	Reference
Liquefied petroleum gas (LPG)	0.06	metric tonnes CO_2-e per GJ	IPCC 2006 Guidelines
Gas/Diesel oil	0.07	metric tonnes CO_2-e per GJ	IPCC 2006 Guidelines
Motor gasoline	0.07	metric tonnes CO_2-e per GJ	IPCC 2006 Guidelines
Sub bituminous coal	0.10	metric tonnes CO_2-e per GJ	IPCC 2006 Guidelines
Methane	23.00	metric tonnes CO_2-e per metric tonne	IPCC Third Assessment Report
Other: Blasting Agents	0.17	metric tonnes CO_2-e per metric tonne	AGO 2006a and the Australian Department of Climate Change
Other: South African Electricity Grid Emission Factor	1.03	Other: metric tonnes CO_2-e per MWh	Eskom Annual Report 2009
Other: Ghanaian Electricity Grid Emission Factor	0.15	Other: metric tonnes CO_2-e per MWh	U.S. Department of Energy
Other: Australian (South) Electricity Grid Emission Factor	0.82	Other: metric tonnes CO_2-e per MWh	NGA factors 2010

Fuel/Material/Energy	Emission Factor	Unit	Reference
Other: Australian (North) Electricity Grid Emission Factor	0.82	Other: metric tonnes CO_2-e per MWh	NGA factors 2010
Other: Peruvian Electricity Grid Emission Factor	0.15	Other: metric tonnes CO_2-e per MWh	U.S. Department of Energy

8. Emissions Data

Boundary (CDP 2010 Q10.1)

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

Select from

- *Financial control*
- *Operational control*
- *Equity share*
- *Climate Change Reporting Framework (CCRF)*
- *Other*

Operational control is exercised

Scope 1 and 2 Emission Data (CDP 2010 Q10.2-10.3; Q12.1; Q13)

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

1,377,194

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

5,164,897

8.4 Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions which are not included in you disclosure?

If yes: **8.4a Please complete the table**

Source	Scope	Explain why the source is excluded
Mine Methane (all operations except Beatrix)	Scope 1	Mine methane has been excluded from all operations except from Beatrix (as it is measured there as required for the CDM project) due to the low level of occurrence and intermittent nature of these emissions. Continuous measurement of methane in mine ventilation air proves that the occurrence of methane in mines other than Beatrix is negligible.

Data Accuracy (CDP 2010 Q12.12; Q13.8)

8.5 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	More than 2%, less or equal to 5%	Metering / Measurement constraints, data management, extrapolation / data gaps	**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 around 2% (based on a review of metering equipment). **Coal 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. Because Gold Fields has got high quality management and accounting practices in place, the data management uncertainty is estimated to be below 2%. **Beatrix fugitive methane** is measured, as this is required for the CDM project which is in the process of registration (the project consist of flaring of this methane). Beatrix mine has more methane emissions than the other mines due to its geological formations. The methane emissions reported are based on spot measurements taken at random times. The

			uncertainty of the reported values is estimated to be 10%. As this represents 50% of the total scope 1 emissions, it translates into 5% uncertainty of scope 1 emissions. Based on the different uncertainty ranges described above, overall scope 1 emissions are estimated to have an uncertainty range of more than 2% but less than or equal to 5%.
Scope 2	Less than or equal to 2%	Metering / measurement constraints	Based on a review on the reliability of electricity meters, it was found that high quality meters (as used at Gold Fields) are typically below a 2% uncertainty range.

External Verification or Assurance (CDP 2010 Q20)

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

Complete

If Scope 1 emissions have been verified or assured (complete or underway), answer questions 8.6a and 8.6b:

8.6a Please indicate the proportion of your Scope 1 emissions that are verified/assured
100%

8.6b Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Type of verification or assurance	Relevant standard	Relevant statement attached
Limited Assurance	**ISAE 3000**	**Attach**

8.7 Please indicate the verification/assurance status that applies to your Scope 2 emissions

Complete

If Scope 2 emissions have been verified or assured (complete or underway), answer questions 8.7a and 8.7b:

8.7a Please indicate the proportion of your Scope 2 emissions that are verified/assured
100%

8.7b Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Type of verification or assurance	Relevant standard	Relevant statement attached
Limited Assurance	ISAE 3000	

Carbon Dioxide Emissions from Biologically Sequestered Carbon (CDP 2010 Q17)

8.8 Are carbon dioxide emissions from the combustion of biologically sequestered carbon (i.e. carbon dioxide emissions from burning biomass/biofuels) relevant to your company?

If yes: **8.8a Please provide the emissions in metric tonnes CO2e**

63,709 tCO2 in 2010 due to carbon sequestration (timber used in underground operations)

9. Scope 1 Emissions Breakdown (CDP 2010 Q12.2-12.6)

9.1 Do you have Scope 1 emission sources in more than one country or region (if covered by emissions regulation at a regional level)?

Yes

If yes: **9.1a Please complete the table below**

Country/Region	Scope 1 metric tonnes CO2e
South Africa	1,009,307.21
Ghana	241,932.85
Australia	98,760.89
Peru	27,193.53

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

- ☐ By business division (9.2a)
- X By facility (9.2b)
- ☐ By GHG type (9.2c)
- ☐ By activity (9.2d)

9.2a Please break down your total global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)

9.2b Please break down your total global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)
Beatrix (incl. Mine methane)	987,850.46
KDC West	7,013.25

KDC East	**5,200.74**
South Deep	**9,242.75**
Tarkwa	**195,965.76**
Damang	**45,967.08**
St Ives	**86,580.80**
Agnew	**12,180.09**
Cerro Corona	**27,193.53**

9.2c Please break down your total global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)

9.2d Please break down your total global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)

10. Scope 2 Emissions Breakdown (CDP 2010 Q13.2-13.5)

10.1 Do you have Scope 2 emissions sources in more than one country or region (if covered by emissions regulation at a regional level)?

Yes

If yes: **10.1a Please complete the table below**

Country/Region	Scope 2 metric tonnes CO2e
South Africa	**4,883,875.37**
Ghana	**68,484.95**
Australia	**190,332.93**
Peru	**22,203.84**

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

☐ **By business division (10.2a)**
X **By facility (10.2b)**
☐ **By activity (10.2dc)**

10.2a Please break down your total global Scope 2 emissions by business division

Business division	Scope 2 emissions (metric tonnes CO2e)

10.2b Please break down your total global Scope 2 emissions by facility

Facility	Scope 2 emissions (metric tonnes CO2e)
Beatrix	**827,062.60**
KDC West	**1,723,818.37**

KDC East	**1,746,928.41**
South Deep	**586,065.99**
Tarkwa	**50,728.76**
Damang	**17,756.19**
St Ives	**149,772.65**
Agnew	**40,560.28**
Cerro Corona	**22,203.84**

10.2c Please break down your total global Scope 2 emissions by activity

Activity	Scope 2 emissions (metric tonnes CO2e)

11. Scope 2 Contractual Emissions (CDP 2010 Q14)

11.1 Do you consider that the grid average factors used to report Scope 2 emissions in question 8.3 reflect the contractual arrangements you have with electricity suppliers?

Yes

If no, complete questions 11.1a and 11.1b:

11.1a You may report a total contractual Scope 2 figure in response to this question. Please provide your total global contractual Scope 2 GHG emissions figure in metric tonnes CO2e

11.1b Explain the basis of the alternative figure (see guidance)

11.2 Has your organization retired any certificates, e.g. Renewable Energy Certificates, associated with zero or low carbon electricity within the reporting year or has this been done on your behalf?

No

If yes: **11.2a Please provide details including the number and type of certificates**

Type of certificates	Number of certificates	Comments

12. Energy (CDP 2010 Q12.8; Q12.10; Q13.6)

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

More than 15% but less than or equal to 20%

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

Energy Type	MWh

Fuel	1,559,667.87
Electricity	5,580,332.16
Heat	0
Steam	0
Cooling	0

0.5 point per row (2.5 totals). Zero is valued as an input and therefore earns the 0.5 point.

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

Fuels	MWh
sub-bituminous coal	**107,152**
LPG	**35,538**
Diesel/Gas oil	**1,411,136**
Motor Gasoline	**5,841**

13. Emissions Performance

Emissions History (CDP 2010 Q19)

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

Increased

If emissions have increased, decreased or remained the same overall:

13.1a Please complete the table

Reason	Emissions value (percentage)	Direction of change	Comment
'other'	2.1%	Increased	More ore had to be milled to achieve the same gold output and mining took place deeper underground than last year which increased energy usage.
Emission Reduction activities	2.7%	Decreased	Beatrix increased its ore mining with 13% but still managed, through energy efficiency projects, to reduce its energy use and therefore it's combined absolute scope 1 and 2 emission with 2.7%.
Emission Reduction activities	0.4%	Decreased	KDC East increased its ore mining with17% but still managed, through energy efficiency projects, to reduce its energy use and therefore its combined absolute scope 1 and

			2 emissions with 0.4%

Emissions Intensity (CDP 2010 Q18)

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

Intensity Figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Explanation
162.97	Metric tonnes CO2	Unit total revenue (RM)	5.9%	Decrease	Revenue increased more than CO2 emissions and therefore, fewer emissions per RM revenue were obtained this year compared to last year.

13.3 Please describe your gross combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per full time equivalent (FTE) employee

Intensity Figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Explanation
118.57	Metric tonnes CO2	FTE Employee	10.2%	Increase	Absolute CO2 emissions increased, while the total amount of FTE Employees decreased in 2010 compared to 2009. Therefore, the total emissions per FTE Employee increased.

13.4 Please provide an additional intensity (normalized) metric that is appropriate to your business operations

Intensity Figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Explanation
1.30	Metric tonnes CO2	Ounce of gold mined	5.8%	Decrease	This intensity figure was

					corrected for lower quality of ore that was mined and increased mining depth. When correcting for these 2 factors, it was found that energy intensity decreased compared to previous years. This is due to energy efficiency project implemented by Gold Fields.

14. Emissions Trading (CDP 2010 Q21)

14.1 Do you participate in any emissions trading schemes?

No, we don't participate nor do we currently anticipate participating in any emissions trading scheme within the next two years.

If yes: **14.1a 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

And if "yes" or "we don't currently, but we anticipate doing so within the next 2 years":
14.1b What is your strategy for complying with the schemes in which you participate or anticipate participating?

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

Yes

If yes: **14.2a Please complete the following table**

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e) (annual)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits retired	Purpose, e.g. compliance
Credit Origination	Coal mine / bed CH4	The Capture and Utilisation of Methane at the Gold Fields' owned Beatrix Mine in South Africa	CDM	250,000	250,000	No	Not applicable
Credit Origination	Energy efficiency: industry	KDC East #3 Ice Chiller project	CDM	53,000	48,000	No	Not applicable
Credit origination	Biomass Energy	KDC West – Driefontein Renewable Energy Project	CDM	50,000	25,000	No	Not applicable
Credit Origination	Coal mine / bed CH4	Beatrix 4 Shaft – Methane capture and utilization	CDM	200,000	160,000	No	Not applicable
Credit Origination	Energy efficiency: own generation	Beatrix – waste heat recovery	CDM	14,000	7,000	No	Not applicable

15. Scope 3 Emissions (CDP 2010 Q15)

15.1 Please provide data on sources of Scope 3 emissions that are relevant to your organization

Sources of Scope 3 emissions	Metric tonnes CO2e	Methodology	If you cannot provide a figure for emissions, please describe them
Purchased goods & services	421,042	Followed ISO 14064-1. Emission factors for the production of diesel (weighted average of production data from Shell CDP 2009, Sasol CDP	

		2009, Chevron CDP 2009), petrol (weighted average of production data from Shell CDP 2009, Sasol CDP 2009, Chevron CDP 2009), LPG (Sasol CDP 2010), coal (Exxaro CDP 2010), timber (Environ. Qual. 35 (2006)), blasting agents (miningandblasting.worldpress.com), lime (Kenefick & Tate (2005), cement (IEA, 2007) and caustic soda (Worrell et al., University of California (2000)) were sourced and multiplied with the consumption data of each material.	
Transportation & distribution	6,399	Followed ISO 14064-1. An average transportation distance was estimated based on the location of all the most important suppliers. An emission factor of 0.187kg CO2/tonne km was sourced from Defra (July 2008) and multiplied with the total tonnage km's.	
Business Travel	6,940	Followed ISO 14064. Consisted of air and road travel and excluded road travel in Peru as this was not yet monitored in 2010. Road travel distances were multiplied with the average petrol car fuel consumption (based on Defra, 2008 data) and the petrol emission factor (2.27 kg CO2/l as calculated from calorific value, density and combustion factors presented by the IPPC (2006)). Air travel was sub categorised in short, medium and long haul and total amounts multiplied with the relevant emission factors as obtained from Jardin, Oxford University Centre for the Environment (2009).	
Transportation and distribution of sold products	7,057	Followed ISO 14064. For each operation the refineries which take of the gold distance to the mine were calculated. These tonne km's were multiplied with Defra's emission factors for either road or air transportation.	
Use of sold product	1,753	Followed ISO 14064. The sold gold still needs to be smelted and refined.	

		Average energy requirement for smelting and refining is 41737.70 MJ/ tonne of gold (National Resources Canada, average between 1997-2007). Total energy requirements for gold smelting and refining are multiplied with the countries specific grid electricity emission factor.	
Waste	0.09	Followed ISO 14064. The Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO) published gold recycling and disposal percentages. These percentages were used to calculate the amount of gold which is expected to end up in landfills. This amount of gold to be disposed of in landfills was multiplied with a organic product disposal emission factor published by the US Environmental Protection Agency.	
Employee commuting	17,990	Followed ISO 14064. The percentage of total amount of employees that use private transport to get to work was estimated (based on income it was estimated which % of employees could afford private transport), as well as the average distance that needs to be travelled. It was assumed that 80% uses petrol cars and 20% of the employees that have private transport use diesel cars. This assumption followed the South African percentage of diesel vs. Petrol cars on the roads. This total amount of employee kilometres travelled to work was multiplied with a petrol emission factor (2.27 kg CO2/l as calculated from calorific value, density and combustion factors presented by the IPPC (2006)) or diesel emission factor (2.71 kg CO2/l as calculated from calorific value, density and combustion factors presented by the IPPC (2006)).	
Supplier emissions	15,147	Followed ISO 14064. Contractor fuel at the international operations is	

		controlled and owned by Gold Fields hence its inclusion into the Scope 1 Emissions. Contractor fuel for the South African operation is owned and controlled by the contractors themselves and hence its inclusion into the Scope 3 Emissions. The South African contractors have recorded their diesel usage, which was multiplied with a diesel emission factor (2.71kg CO2/l as calculated from calorific value, density and combustion factors presented by the IPPC (2006)).	
Total	**476,328**		

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

Please respond to this question by selecting one of the options from the list below, which will available as a drop down menu in the ORS.

- *No emissions data provided*
- *Not verified or assured*
- *Verification or assurance underway but not yet complete- first year it has taken place*
- *Verification or assurance underway but not yet complete- last year's certificate attached*
- ***Verification or assurance complete***

If Scope 3 emissions have been verified or assured (complete or underway), answer questions 15.2a and 15.2b:

15.2a Please indicate the proportion of your Scope 3 emissions that are verified/assured

More than 60% but less than or equal to 80%

15.2b Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Type of verification or assurance	Relevant standard	Relevant statement attached?
Limited assurance	ISAE3000	Attach

15.3 How do your absolute Scope 3 emissions for the reporting year compare to the previous year?

Increased

If emissions have increased, decreased or remained the same overall:

15.3a Please complete the table

Reason	Emissions value (percentage)	Direction of change	Comment

Change in output	1.6%	Increase	**Purchased goods and services** + **delivery** of these materials - More ore had to be mined to get the same gold output, therefore more mining materials had to be purchased and delivered. Furthermore, this increase is due to ramp up of production at Cerro Corona
Change in boundary	3.3%	Increase	**Supplier emissions** -were previously not included
Change in boundary	0.6%	Increase	**Business travel –** now included employee flight commuting in Peru and Australia, where this was previously excluded
Change in boundary	1.3%	Increase	**Transportation and distribution of sold products -** Increase due to the accounting of emissions from mine to refineries of the international operations; these were previously excluded.
Change in boundary	-0.2%	Decrease	**Use of sold product –** as less gold was sold in 2010 compared to 2009
Change in boundary	-3.0%	Decrease	**Employee commuting –** less employees in 2010 compared to 2009