Decarbonising our mines

GRAEME OVENS
Vice President, Operations, Gold Fields Australia

Energy and Mines Perth 2019
Certain statements in this document constitute “forward looking statements” within the meaning of Section 27A of the US Securities Act of 1933 and Section 21E of the US Securities Exchange Act of 1934.

In particular, the forward looking statements in this document include among others those relating to the Damang Exploration Target Statement; the Far Southeast Exploration Target Statement; commodity prices; demand for gold and other metals and minerals; interest rate expectations; exploration and production costs; levels of expected production; Gold Fields’ growth pipeline; levels and expected benefits of current and planned capital expenditures; future reserve, resource and other mineralisation levels; and the extent of cost efficiencies and savings to be achieved. Such forward looking statements involve known and unknown risks, uncertainties and other important factors that could cause the actual results, performance or achievements of the company to be materially different from the future results, performance or achievements expressed or implied by such forward looking statements. Such risks, uncertainties and other important factors include among others: economic, business and political conditions in South Africa, Ghana, Australia, Peru and elsewhere; the ability to achieve anticipated efficiencies and other cost savings in connection with past and future acquisitions, exploration and development activities; decreases in the market price of gold and/or copper; hazards associated with underground and surface gold mining; labour disruptions; availability terms and deployment of capital or credit; changes in government regulations, particularly taxation and environmental regulations; and new legislation affecting mining and mineral rights; changes in exchange rates; currency devaluations; the availability and cost of raw and finished materials; the cost of energy and water; inflation and other macro-economic factors, industrial action, temporary stoppages of mines for safety and unplanned maintenance reasons; and the impact of the AIDS and other occupational health risks experienced by Gold Fields’ employees.

These forward looking statements speak only as of the date of this document. Gold Fields undertakes no obligation to update publicly or release any revisions to these forward looking statements to reflect events or circumstances after the date of this document or to reflect the occurrence of unanticipated events.
Agenda

i. Gold Fields – who are we

ii. Meeting Gold Fields’ sustainable mining vision

iii. Granny Smith hybrid renewable energy project

iv. Agnew Gold hybrid renewable energy project

v. Future opportunities
Gold Fields Group (2018)

- Top 10 of the world’s gold miners
- Listings on the JSE and NYSE
- Total gold output >2Moz
- Energy spend US$258m (17% of OPEX) US$115/ounce

Americas region

- Mine: Cerro Corona (Peru)
- Project: Salares Norte (Chile)
- 314koz
- 10% of GFL total energy

South Africa region

- Mine: South Deep
- 157koz
- 18% of GFL total energy

West Africa region

- Mines: Tarkwa and Damang
- JV project: Asanko Gold Mine
- 680koz
- 46% of GFL total energy

Australia region

- Mines: St Ives, Granny Smith and Agnew
- JV Project: Gruyere
- 886koz
- 26% of GFL total energy

Global Footprint

Decarbonising our mines | Graeme Ovens | June 2019
Mining Contribution
- 17 years in Western Australia
- One of the largest gold miners in Australia
- Underground (80%) and Open Pit (20%)
- 43% of Group gold production
- 42% of Group net cash-flow
- Approx. 2,200 employees and contractors
- A$834m total exploration spend since 2002

2018 Energy Profile
- 95% of electricity use generated from gas
- 225km gas laterals to mines
- 5% electricity generated from diesel
- Diesel used primarily for our fleet of machines and vehicles
- Energy Spend to Opex: 15%
Energy security for miners

Energy challenges facing the global mining industry

- Availability of energy
- Reliability of energy supply
- Affordability of energy
- Addressing energy’s climate impacts
What Gold Fields has been doing

Implementing an integrated energy and carbon management strategy

- Strengthen energy security
- Improve energy efficiency & costs
- 2020 aspirational goals
  - Cost savings
  - Carbon footprint reduction
  - Business integration
- Reduce carbon emissions (adapt to climate-related risks)
- Integrate energy management into business (ISO 50001 ready)

Decarbonising our mines | Graeme Ovens | June 2019
Gold Fields’ electrification journey

Our gradual transition towards low carbon and renewable energy

- 128 kW solar rooftop systems commissioned at Helen Rd
- Agnew power options FS
- Cero Corona 5 MW floating solar PV PFS, negative
- GSM solar power PFS
- ISO 50001 certified
- 12MW solar under construction, additional >40MW under study
- 18MW wind under construction
- 15MW combined battery under construction
- Global group reduction >200 ktCO2e/year from high impact supply projects

2015
- Energy security assessments & 5-year regional plans developed
- South Deep 40 MW solar PV FS

2016
- GSM diesel to gas power plant (24 MW) commissioned
- Genser gas turbines commissioned at Tarkwa (22 MW) and Damang (25 MW)

2017
- Progressing evaluation at Salares Norte “20% renewable energy”

2018
- Tarkwa 15 MW gas turbine installed
- South Deep 40 MW solar PV: Regulatory changes
- GSM solar-battery FS complete, positive

2019
- Reviewing renewables in Ghana
- GSM solar/battery construction
- Agnew hybrid power station construction

- “134MW gas installed, additional 16MW under construction
- 12MW solar under construction, additional >40MW under study
- 18MW wind under construction
- 15MW combined battery under construction
- Global group reduction >200 ktCO2e/year from high impact supply projects
Granny Smith hybrid renewable energy project
● 21MW gas-fuelled power station commissioned in 2016 from diesel generation, expanded to 24.2MW in 2018

● Increased demand from mining operations – ventilation and paste installations due to mining at depth

● Opportunity to avoid increased commitments to gas supply by meeting increased demand with renewables

● Single supplier for power (IPP-Aggreko) – ease of integration, reduced risk
Granny Smith hybrid renewable energy project

Solar battery hybrid under construction

- Heads of Agreement announced at Energy & Mines 2018, contract signed December 2018
- Technically optimal solution: 8MW solar and Aggreko in-house modular 2MW/1MWh lithium-ion battery unit
- Clearing and construction commenced in May 2019 for a 20,000 solar panel farm
- Commissioning expected by late 2019
- Annual emissions savings of ~9,500 t CO₂-e
- Reduced fuel consumption of 10-13%
- Funded by Aggreko – 14 year supply deal
Agnew hybrid renewable energy project
Electricity transmission capacity restricted by existing infrastructure constraints

Consuming diesel on site to meet additional electricity demand

Challenges:
- 5-year PPA coming to an end
- Time constrained – 2 years to get operational
- No renewable resource data for the site
- Managing change to renewables – understanding the risks

Strong business signals to decarbonise energy supply
Agnew hybrid renewable energy project

Feasibility studies and project de-risking

- Energy modelling with consultants Advisian
- Early project de-risking:
  - SODAR to collect and understand wind resource
  - Geotechnical investigations for solar and wind farms
  - EOI process to shortlist consortia with technical and financial capability
  - ‘Shared risk’ tender package
- Gas, hybrid solution offered the lowest cost solution over a range of assumptions
Agnew hybrid renewable energy project

Gas and solar under construction

- Optimised hybrid microgrid consisting of:
  - 18MW through 5 wind turbines
  - 4MW solar plant (10,000 panels)
  - 13MW/4MWhr battery unit
  - 16MW gas plant to underpin demand
  - 25km gas supply pipeline

- Construction schedule:
  - Gas pipeline: Completed May 2019
  - Gas, solar power plants: Start Sept 2018 / Completion August 2019
  - Wind turbines and battery plant: Start July 2019 / Completion May 2020

- Funding of A$112m project:
  - Funded by EDL – 10-year supply deal
  - ARENA recoupable contribution: A$13.5m

Benefits for Agnew:
- Up to 60% of Agnew’s energy needs from renewable power
- Potential for 100% renewable energy during periods of high winds
- Annual emissions savings of ~40,700 t CO₂-e
Gold Fields’ energy future
### How can we energise the mine of the future

**Future opportunities in powering our mines**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrified: weaned off diesel</td>
<td></td>
</tr>
<tr>
<td>Gas: a key transition fuel</td>
<td></td>
</tr>
<tr>
<td>Diversified energy mix: wind, gas, solar</td>
<td></td>
</tr>
<tr>
<td>Modular and connected</td>
<td></td>
</tr>
<tr>
<td>More storage</td>
<td></td>
</tr>
</tbody>
</table>

Coupled with digital technology changes, these opportunities will disrupt how mines are designed, operated and closed
Thank you

QUESTIONS AND ANSWERS