Renewables and Mining Summit 2014

DUNCAN STEVENS AND MARTIN SPROTT

Evaluating Renewables for Gold Fields' Global Operations

23 June 2014

GOLD FIELDS

Overview

- Gold Fields renewable energy & carbon goals/commitments
- Methodologies for assessing feasibility of renewables
- Opportunities and barriers to incorporating renewables

To be the Global Leader in Sustainable Gold Mining

Fundamental Changes to Gold Fields

Unlocking and Creating Value

Aug 2012

'What Investors Want': Keynote speech by Nick Holland at the Melbourne Mining Club

Aug to Dec 2012

Portfolio review

Dec 2012 to Feb 2013

Unbundling of Sibanye Gold

Jan to Feb 2013

New cash-focused business plan

Apr 2013 onwards

Slump in the gold price

Oct 2013

Acquisition of the Yilgarn South Assets

Oct 2013 onwards

Review of growth strategy – including closure of the Growth and International Projects unit and rationalisation of growth portfolio

Feb 2014

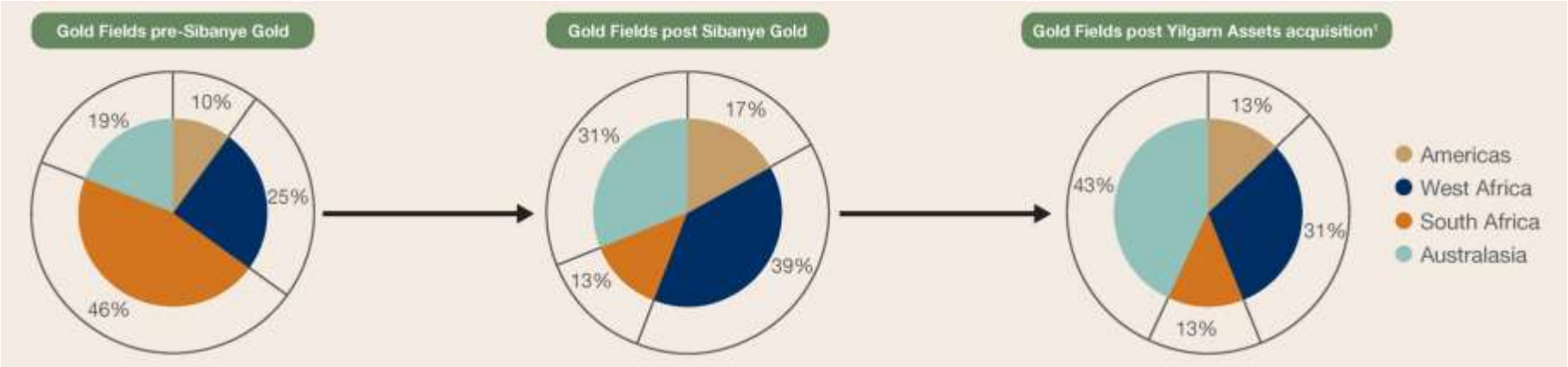
New South Deep life-of-mine plan

Unlocking and Creating Value

Fundamental Changes to Gold Fields

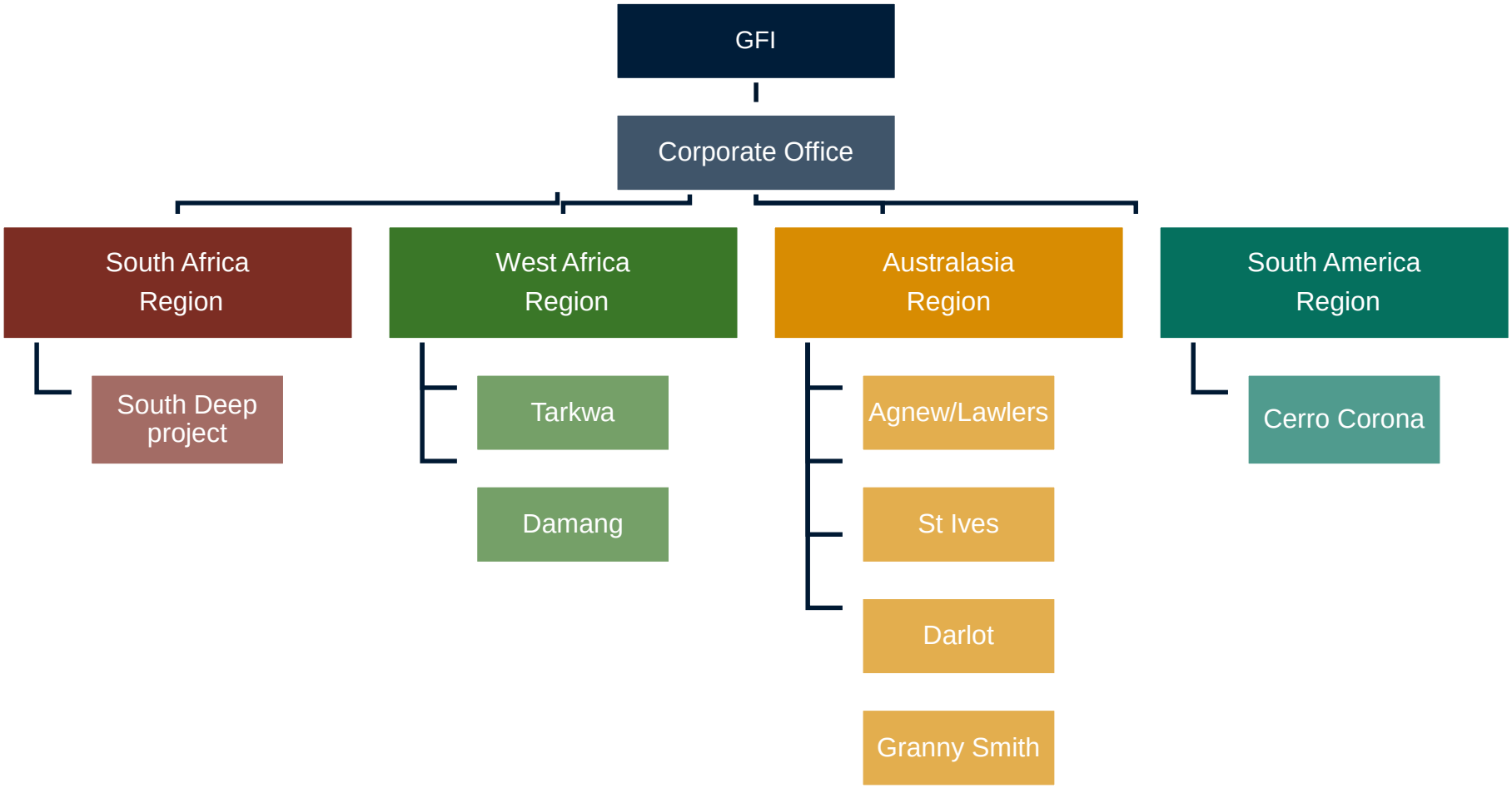
Gold Fields has changed fundamentally over the past year

- From Top 4 to mid-tier mining company
- 43% of production from our Australian operations
- 13% of production from South Africa (46% pre-unbundling)
- Group wide restructuring



2013: A Year of Change

New Operating Model and Structure



Regionally De-centralised Model

Gold Fields Commitment to Renewable Energy

Our Commitment Remains Unchanged: Strong Group Support

- Entrenched through our Group Carbon Policy and Guideline
- Supported at a Board and ExCo level
- Strong CEO commitment
- Group Energy and Carbon Management Strategy developed in 2012
- Revision of the Strategy and Actions Plans per Region: **End Q2 2014**
- Engage and lobby through a variety of forums (*founding member of the Goldfields Renewable Energy Lobby to promote deployment of large scale renewable energy generation for the north eastern goldfields region in Australia; ICMM, Chamber of Mines)*

"Global warming & climate change is a reality that requires global action" **Gold Fields Carbon Policy**

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Gold Fields Commitment to Renewable Energy

Group Strategic Renewable Energy Commitments

1. Review replacement of carbon-intense sources of energy with renewable energy or switch to less intense energy sources (taking security of supply or price demands into account)
2. No operation should go backwards to a more carbon-intense source (unless security of supply or price demands)
3. Identify short, medium and long term renewable energy initiatives that meet regional and operational IRR requirements
4. Determine what investments need to be made and budget accordingly
5. 20% renewable energy generation on average in all new mine developments
6. 13% carbon emission reductions target set against ‘business as usual’ carbon emissions by 2016. Currently being revised to regional targets
7. Engaging relevant stakeholders as partners in creating shared value for renewable energy related projects

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Integrated Energy and Carbon Management Strategy

Energy & Carbon strategy based on five strategic pillars and a set of enabling factors

The **"Plan"** pillar entails embedding energy and carbon in all planning and stage gate processes.

The **"Replace"** pillar centres on replacing carbon-intense energy with renewable energy sources, or switching to less intense energy sources (i.e. coal to gas)

Strategic Framework

Gold Fields Commitment to Renewable Energy

Transparent Reporting – Carbon Disclosure Leadership Index

2010	2011	2012	2013
Joint 1st	1st	2nd	Joint 1st

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Why Renewable Energy?

Costs, Carbon Reduction and Energy Security

- Extremely energy and carbon intensive industry
- Key cost driver: 18% - 20% of our operational cost base
- Continued rising global costs due to increasing energy demand & supply constraints
- **Strategic imperative to secure a sustainable future**
- Energy Security (reliability of supply and dependency on a single source)
- Reduce carbon footprint as a sustainable gold miner
- Offset future carbon taxes
- Generate carbon credits through CDM projects (US$48 000)

"solar is growing so fast it is going to overtake everything...It could double every two years" Chairman of the Federal Energy Regulatory Commission

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Why Renewable Energy?

Costs, Carbon Reduction and Energy Security

- Increase in remote (off-grid) projects
- Could be a legacy asset for local communities after mine closure
- Price parity fast becoming a reality
- Significant technological advances in renewables

"*Oracle of Omaha to install 656 large wind turbines at a cost of $1.9 billion in Iowa*" (**CNN 2014**)

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Gold Fields Renewable Energy Journey

Renewable Energy Timeline

1
Journey started in 2006: Beatrix, Carbon Management Strategy + CDP

2
Gold Fields Integrated Energy and Carbon Management Strategy

August 2012

3
Energy Efficiency & Renewable Energy Project Implementation

2006 - Present

4
A Year of Change: Evaluation of Renewable Energy Options Slowed

January – December 2013

5
Revitalisation of the IECMS

Q4 2013

6
Finalise and Implement updated Strategy + External Review (Targets and Baselines)

Q2 2014

Our Renewable Energy Journey

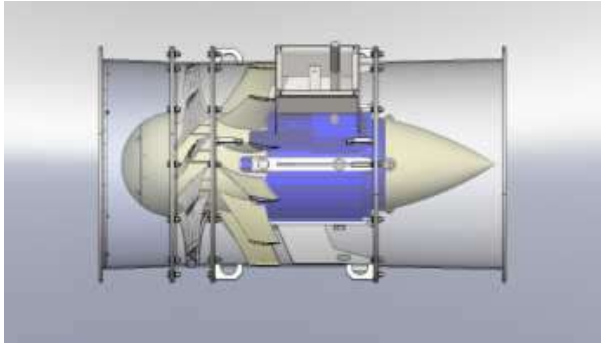
Energy Efficiency Initiatives

2013 Energy Efficiency Savings

- 25 group wide projects
- **South Deep:** 6.5% saving on average electricity consumption: **R52 million** (US$6 million).
- **Australia**: 7% improvement in energy efficiency: **US$8 million**
- **West Africa: US$1.7 million**. Ramped up to US$11.5 million (estimated annual savings by 2016)

CDM Project

- Auxiliary fan energy efficiency project at South Deep registered in July 2013

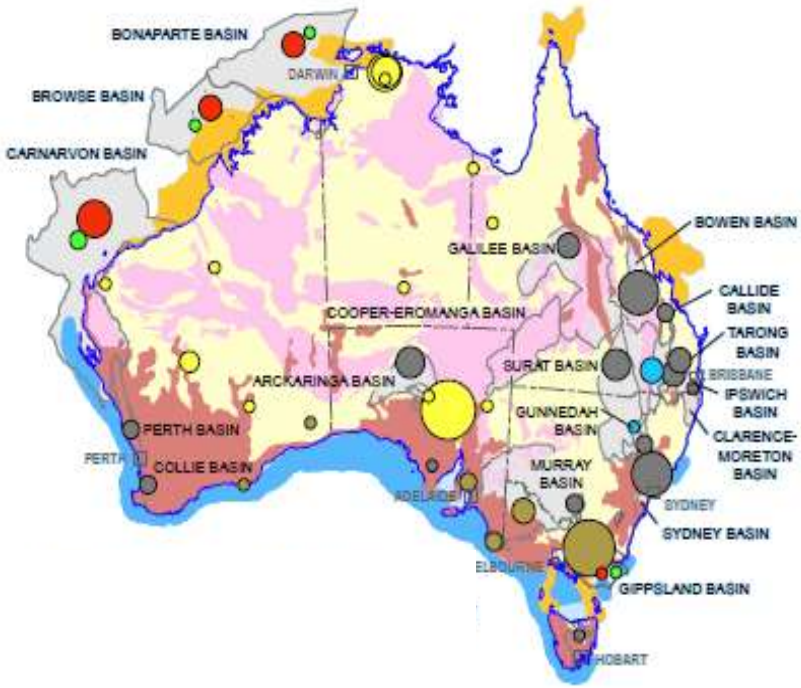


Driving down our costs and carbon emissions

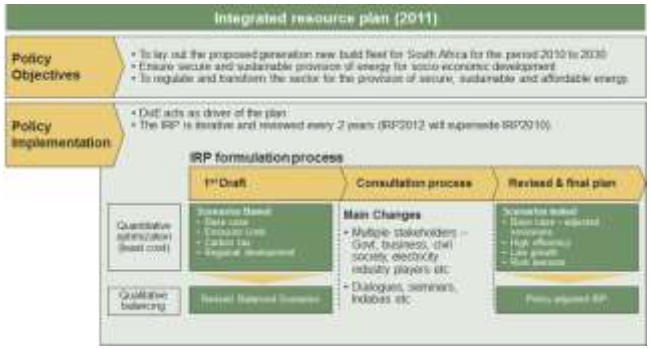
The total renewable energy landscape was reviewed for opportunities relevant to Gold Fields

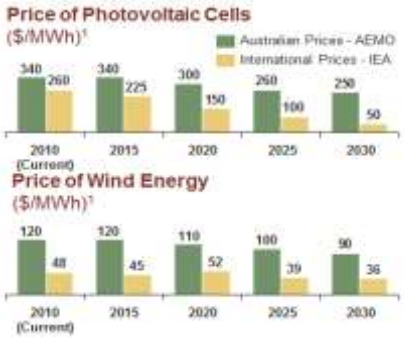
Identify Renewable Energy Opportunities

1. Review all local RE sources



2. Review regulation and cost development





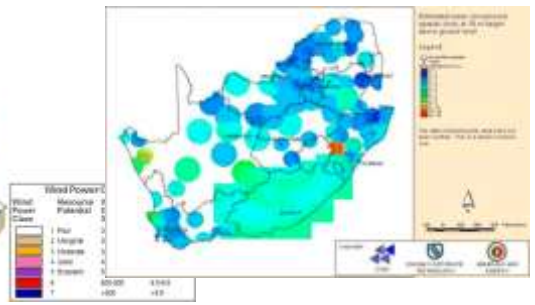
Methodology for Assessing Renewables

Deep dives were made into the most relevant technologies and challenges to implementation identified

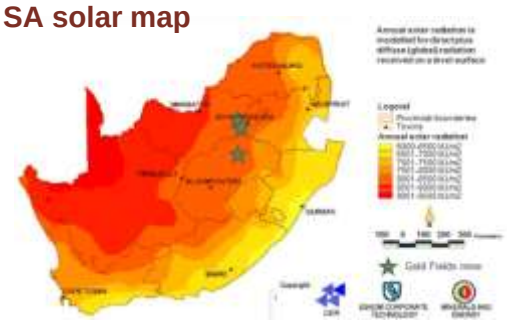
3 Deep dives to consider most feasible technologies

Ghana wind map

SA wind map

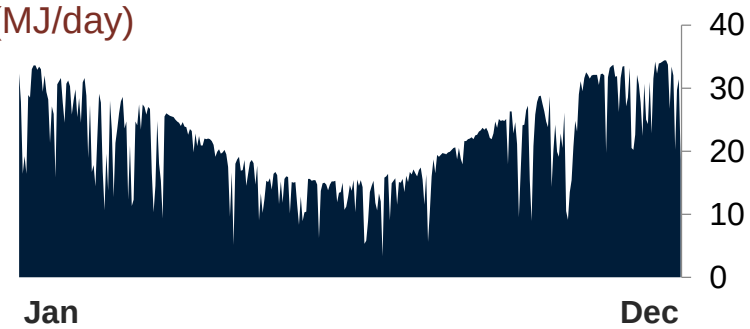


SA solar map

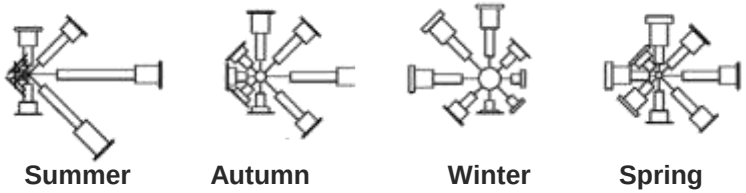


4 Consider challenges to implementation

Solar Power Volatility
(MJ/day)



Wind Power Volatility
(Wind speed and direction)



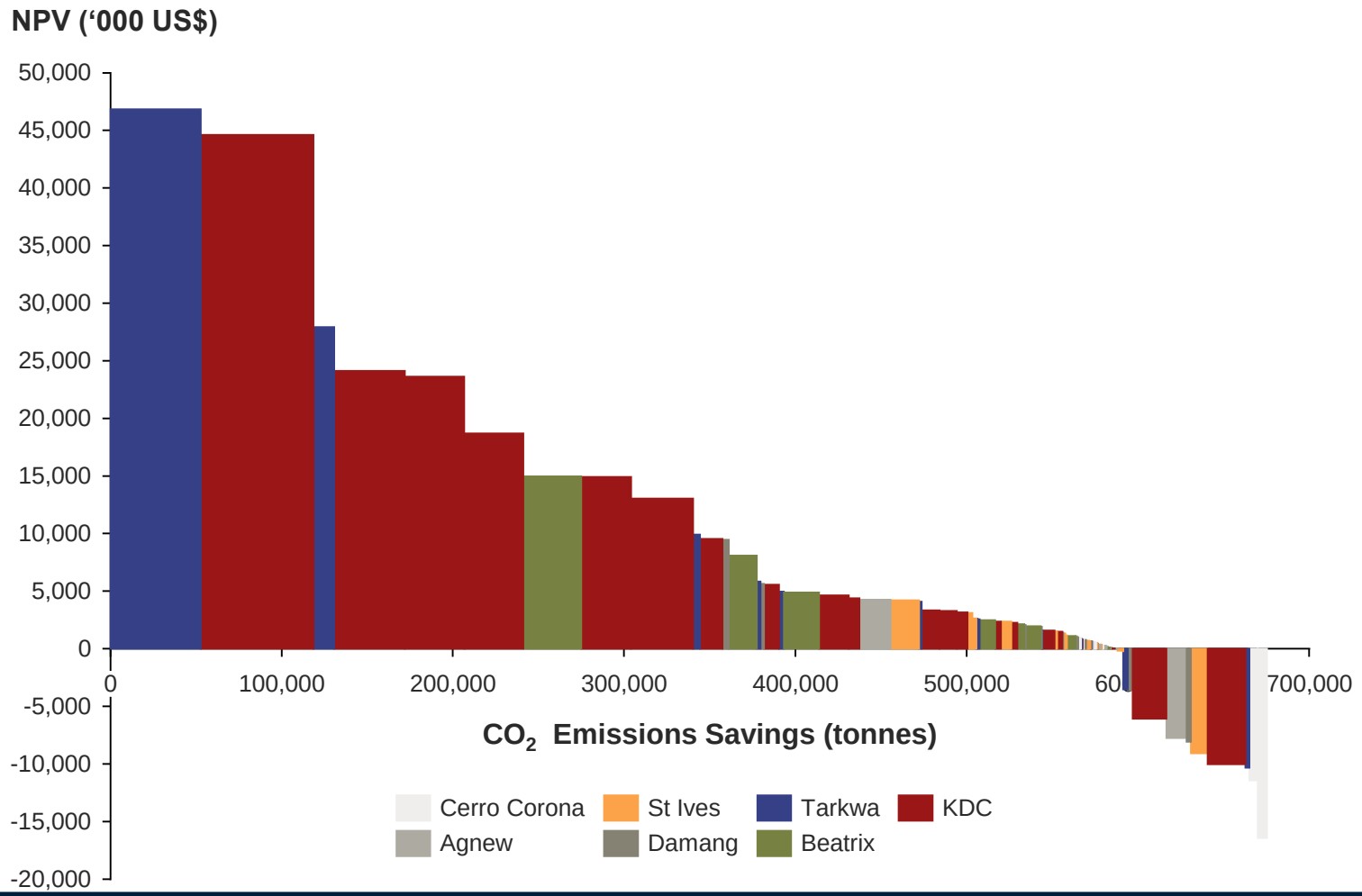
Solar and wind opportunities are offset by the availability of short term grid supplies to balance volatility

Methodology for Assessing Renewables

1

Opportunities were modelled as part of a Gold Fields CO_2 abatement curve

CO_2 emissions - NPV abatement curves (US$ '000, MT - consolidated)

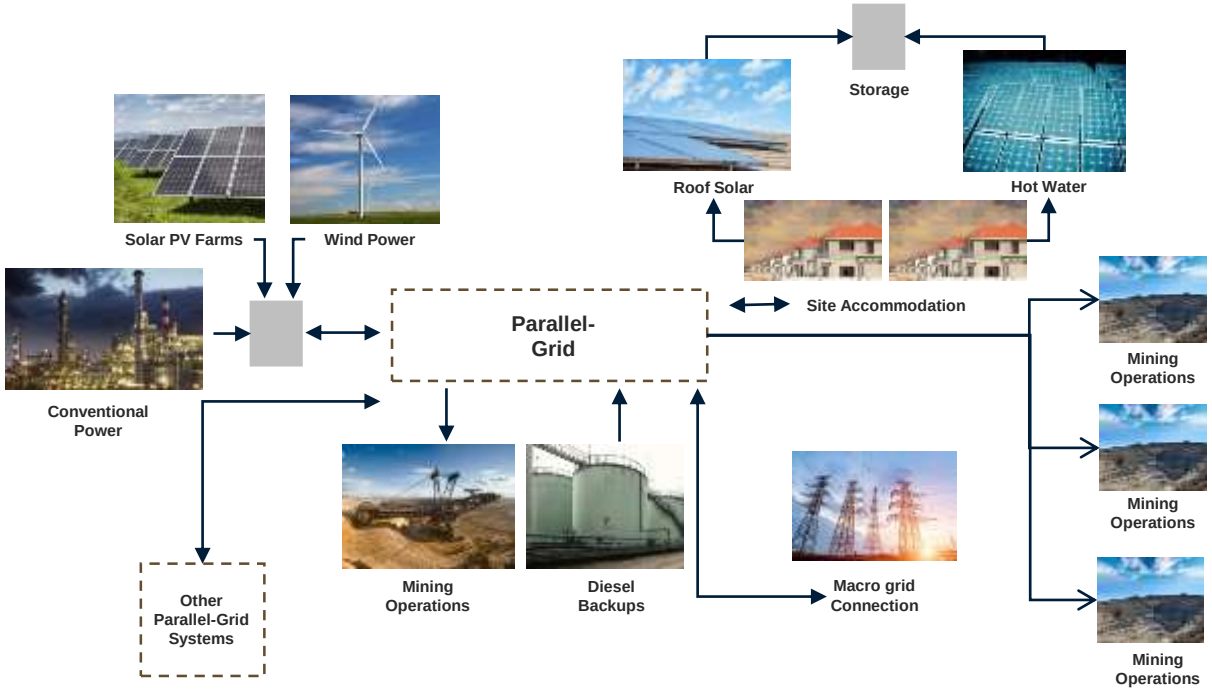


Methodology for Assessing Renewables

Source: Energy & Carbon Strategy project team analysis

A Parallel Grid System Among SA Mining Companies

Unlocking Renewable Energy Potential



Combine fossil fuel and renewables energy sources

Leverage IPP structures

Share the capital cost and risk across many parties

Integrate into the Eskom grid

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Global Opportunities

Opportunities Assessed

West Africa

- 30MW Tarkwa Biomass Power Plant project
- Biogas: Assess viability and potential to generate biogas out of sewage
- Replace diesel light plants with high efficient diesel or solar alternatives

Australasia

- Replacement of diesel lighting towers with a renewable energy hybrid
- Collection of wind and solar data at St Ives to assess potential for wind or solar generation
- Conducted a study on integration of biofuels

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Global Opportunities

Opportunities Assessed

South Africa

- Feasibility study on a biomass to energy project at KDC West - 5 MW in the first phase with the opportunity to generate up to 50 MW (**discontinued operation**)
- Beatrix Methane Project (**discontinued operation**): Officially began in 2006. Electricity generation commenced in March 2013 . Only South African CDM project registered in 2011.
- Awarded the European Energy Risk Deal of the Year award in 2010, as it was the first carbon credit project of its size undertaken by a gold mine

Peru

- Replace diesel light plants with high efficient diesel or solar alternatives
- Build own hydro generation asset

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Barriers to Incorporating Renewables

Barriers to Adopting Renewable Energy Solutions

- Life of mine
- Existing contracts
- Current lower prices of fossil fuel alternatives
- Cash constraints and availability of capital (ROI)
- Financial institutions expertise to assess renewable projects
- Regulatory constraints and uncertainty
- Low global price of carbon credits

"The power sector faces two key challenges in Ghana: the lack of adequate and secure quantities of reasonably priced fuel for power generation, and the lack of public funds to finance the sector's investment requirements": **World Bank 2013**

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Barriers to Incorporating Renewables

Barriers to Adopting Renewable Energy Solutions

- No IPP projects on the west rand yet
- South Africa does not currently allow for net-metering (barrier for grid-connected customers who would like to offset their energy consumption through renewable energy)

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Key Take Away Points

- Strategic imperative to secure a sustainable future
- Gold Fields remains committed to renewable energy solutions
- Top level support and the right partners are essential
- Sound methodology for assessing renewables feasibility
- Realistic goals and targets
- Regional strategies to drive operation specific requirements
- Greater collaboration between peers and partners to share learnings

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Thank You

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