



**GOLD FIELDS**

ENERGY AND MINES WORLD CONGRESS  
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# THE ROLE OF ALTERNATIVE ENERGY IN ADDRESSING MINING'S ENERGY CHALLENGES: OUR EXPERIENCE

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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.

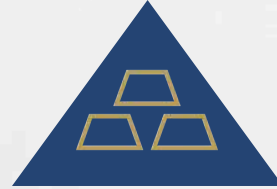
# OUTLINE



Africa's energy challenges



Global trends in solar developments



Gold Fields - who we are



Our energy and carbon management journey



What drives us



The South Deep solar project



Our experience with captive PPAs for renewables

# AFRICA'S ENERGY CHALLENGES

DIVERSITY IN MINERALS AND ENERGY RESOURCES



- Iron ore
- Diamond
- Gold
- Platinum
- Phosphate
- Uranium
- Aluminium
- Copper
- Coal
- Bauxite
- Hydroelectric Energy Project
- Solar Energy Project
- Geothermal Energy Project
- Wind Energy Project
- Coal Production
- Natural Gas Production
- Oil Production

# AFRICA'S ENERGY OPPORTUNITIES

## DIVERSITY IN MINERALS AND ENERGY RESOURCES



Home to **6 of the 10** top fastest growing economies



World's supplier of raw materials

Only a third of the population have access to energy



Energy usage peaked at **3.3%** of global total (2015)

Only **3.6%** of global CO<sub>2</sub> emissions



Africa's challenges:  
Lack of energy infrastructure

Unpredictable and expensive energy costs



Mining energy demand set to **triple** by 2020

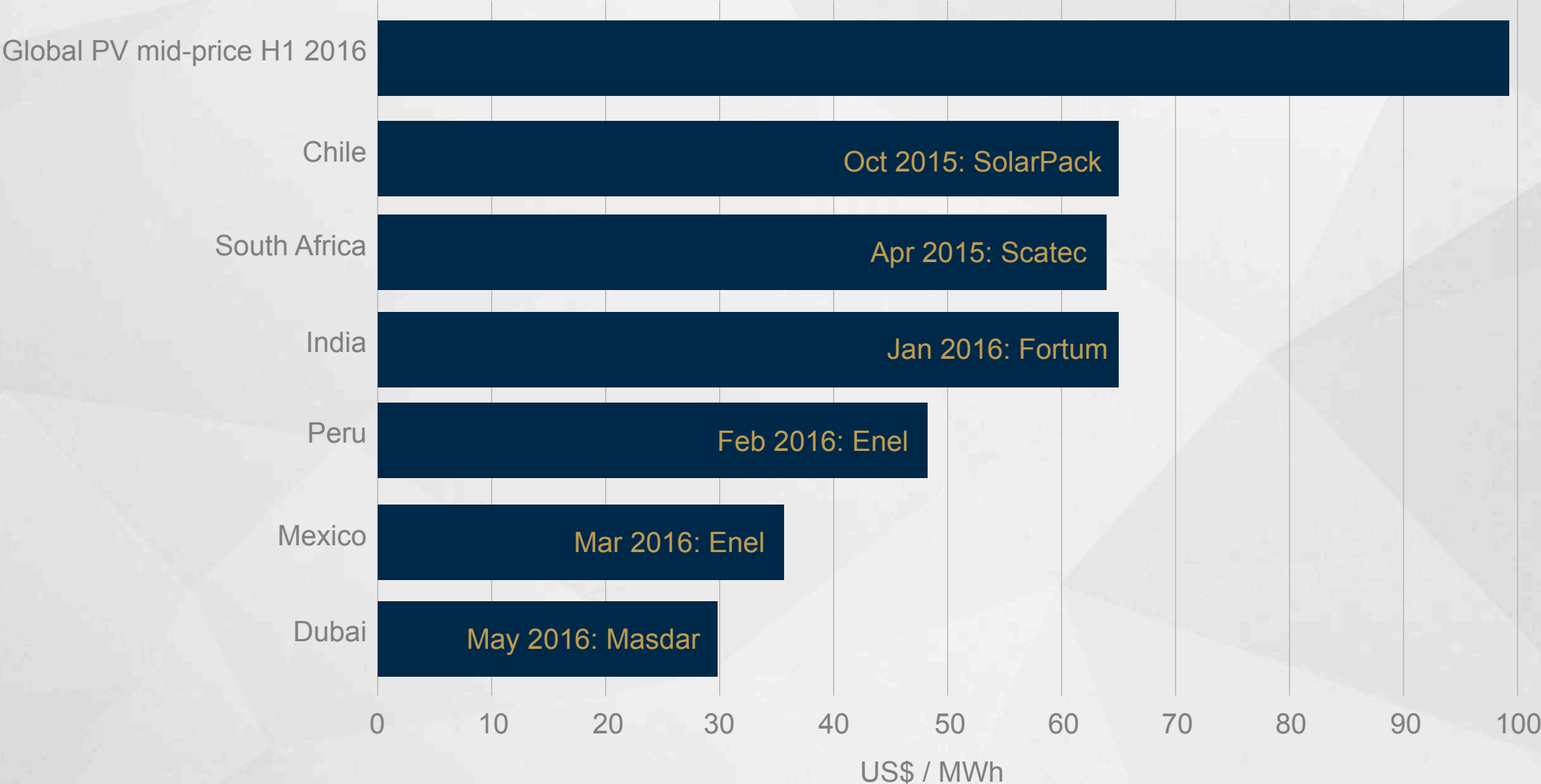


Demand tied to commodity cycles

Mining demand impacts on **non-mining** demand

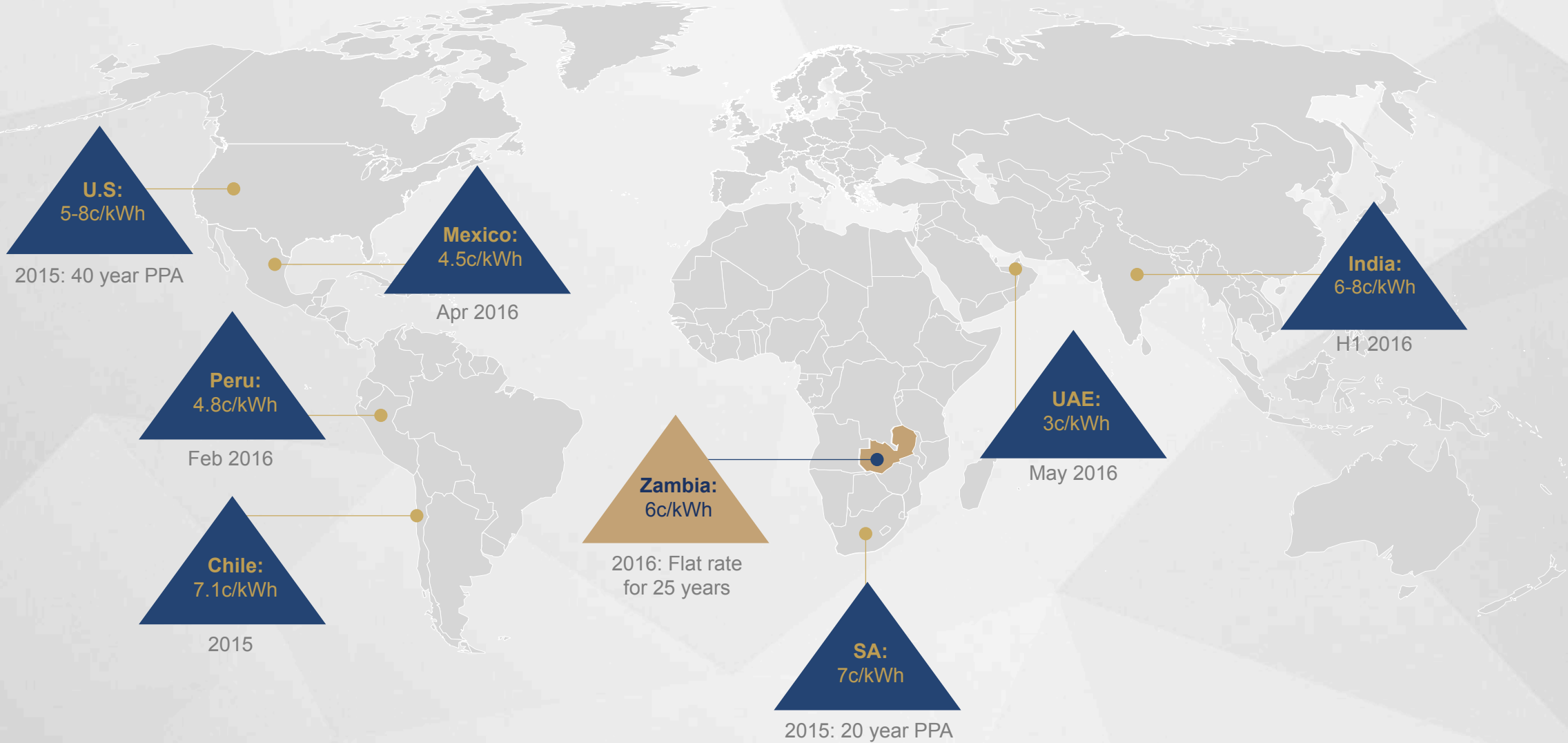
CAN AFRICA REDEFINE THE RENEWABLE ENERGY LANDSCAPE?

# GLOBAL TRENDS IN SOLAR PPAS



Source: Bloomberg New Energy Finance

# LATEST GLOBAL DEVELOPMENTS ON SOLAR PV PPA PRICES



90% COST REDUCTION SINCE 2009

# OBSERVATIONS ON LATEST GLOBAL DEVELOPMENTS ON SOLAR PV PPA PRICES



High **solar** resource regions harnessing energy



Developing nations **catching up**



How long before we see prices **below** \$20/MWh?



Even with oil at \$50/bbl, **solar** appears to be thriving



**Innovative** PPA structures

“OBJECTS IN THE MIRROR ARE CLOSER THAN THEY APPEAR”

# BACKGROUND TO GOLD FIELDS

GOLD FIELDS LIMITED (GFL)



An unhedged, globally diversified producer of gold



Operations in 4 countries: Australia, Ghana, Peru & South Africa, project in Chile



Annual gold production of approximately 2.1 million ounces



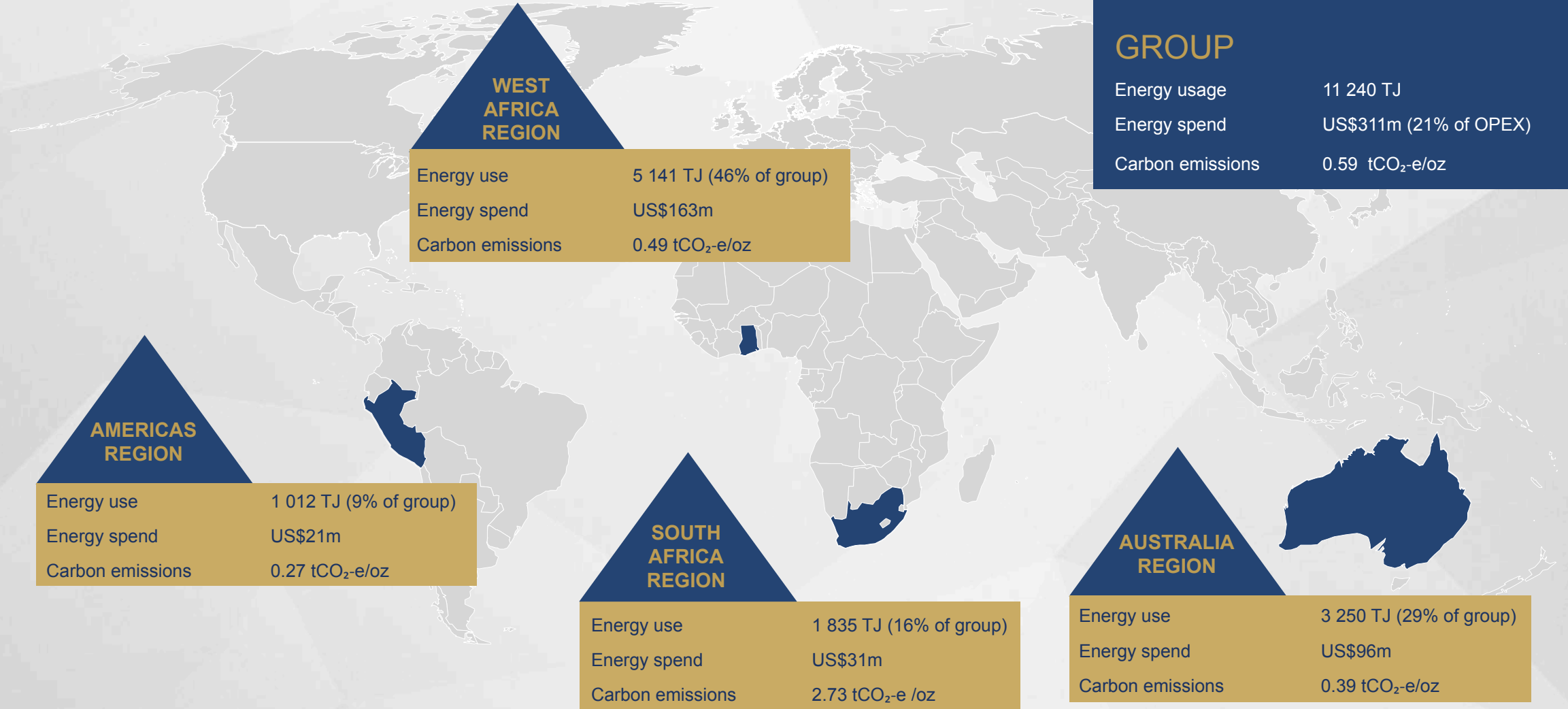
Listed on the JSE, NYSE and SWX

OUR VISION IS TO BE THE 'GLOBAL LEADER IN SUSTAINABLE GOLD MINING'

- Carbon and energy management are key

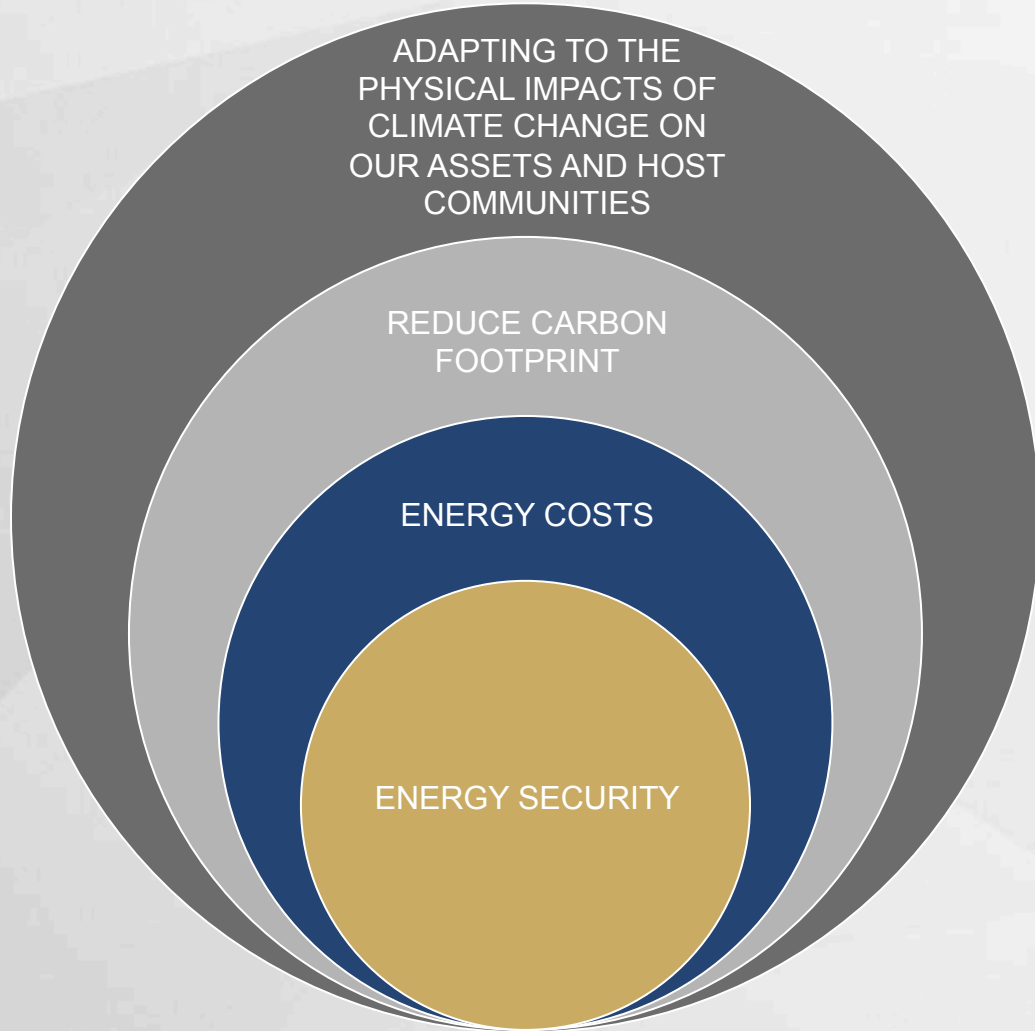
# GOLD FIELDS' ENERGY AND CARBON PROFILE

## OUR 2015 ENERGY AND CARBON FOOTPRINT



# WHAT DRIVES US

## ENERGY SECURITY, ENERGY COSTS AND THE GLOBAL CHALLENGE OF CLIMATE CHANGE



- Development of a climate viewer tool
- Climate change vulnerability risk assessments
- Support the climate change statement



Signed the Paris Pledge for Action



**ROBECOSAM**  
We are Sustainability Investing.



Numerous recognition awards for our long term leadership in climate disclosure and performance



- 10 years of CDP submissions with regular recognition for disclosure and mitigating actions
- 2016: On the CDP A-List

- 3-year regional integrated carbon emission and energy efficiency targets to 2016 & revised Group 2020 targets
- Over US\$40m in cost savings from energy efficiency/optimisation initiatives since Jan 2014



Two renewable energy NGOs - Knowledge partners in our South Deep PV project

# HOW GOLD FIELDS TURNS COMMITMENTS INTO ACTION

SUPPORTED BY TOP MANAGEMENT AND STRATEGIC TO THE GROUP



## POLICIES

- Supported by Board and Group Exco
- Strong strategic intent driven by Board
- Carbon management policy
- Aligned with ICMM policies



## STRATEGY

- Strong visible CEO commitment
- Integrated Energy and Carbon Management Strategy
- Supported by guidelines and structures
- 5-year plans emanating from energy security risk assessments
- 20% renewable energy for all new mines – where feasible



## KPIs AND TARGETS

- Included in Group Performance Scorecards (CEO to Operation)
- System-level energy performance management

“ Rising energy costs, supply constraints and carbon emission standards are some of the challenges we need to address, through, among others increased energy efficiency, use of renewable energy forms and energy storage systems”

**Nick Holland, CEO, “Gold Mining Company of the Future” Presentation 2015**



# GOLD FIELDS' ENERGY INITIATIVES

TAKING A LONG-TERM VIEW

# SOLAR PANELS AT GFL JOHANNESBURG HEAD OFFICE



COMMISSIONED IN NOVEMBER 2015



Reduction in grid  
electricity consumption  
by 60% between  
H1 2015 and H1 2016



Reduction in grid  
electricity costs by 36%  
between H1 2015 and  
H1 2016





Commissioned a  
24 MW gas-powered  
plant at our Granny  
Smith mine, Australia

PPA model



Commissioning of new  
gas plants in November  
by **Genser Power** at our  
**Tarkwa and Damang**  
mines in Ghana  
to supply 40 MW

PPA model





Commitment to 20%  
renewable energy at  
our **new mines**

Salares Norte, Chile



Appointment of an IPP  
for the 40MW solar PV  
plant at the South  
Deep mine in South  
Africa

# BACKGROUND TO THE SOUTH DEEP PV PROJECT

## SOUTH DEEP MINE

 Eskom

Grid connected  
(Eskom), 95% of  
electricity from coal



Energy spend is  
13% of operating  
spend



Average load 55 MW,  
to peak at 80 MW



Life of Mine:  
+70 years



Global Horizontal  
Index (GHI) of  
2 061 kWh/m<sup>2</sup>



# BACKGROUND TO THE SOUTH DEEP PV PROJECT

## THE PROCUREMENT PROCESS



EOI: Expressions of interest  
RFP: Request for proposals

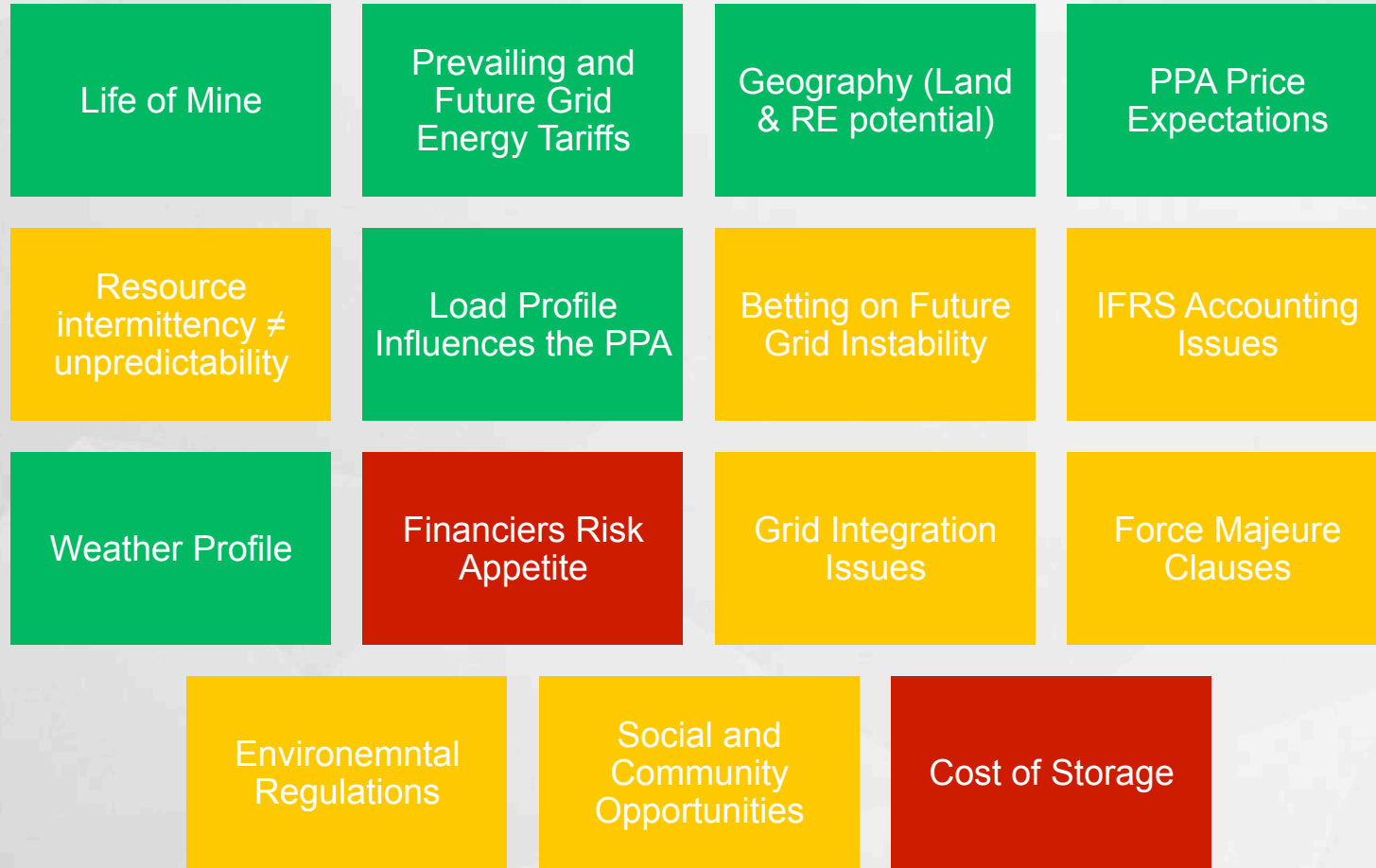


FURTHER, FASTER, TOGETHER

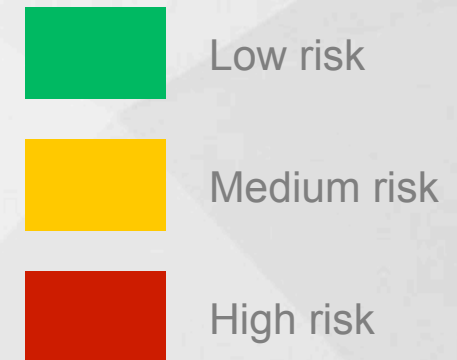


- BMO model under a ~20 year PPA
- Some 150 000 panels to be installed
- Produces ~20% of annual electricity
- ~100 000 tCO<sub>2</sub>-e / year avoided
- Socio-economic initiatives for our host communities:
  - Job creation
  - Skills development
  - Local procurement
  - Community investment initiatives

# CONSIDERATIONS FOR CAPTIVE RENEWABLE PPAs IN AFRICA



BASED ON OUR AFRICAN EXPERIENCE ON REACHING AN ECONOMIC AND TECHNICAL FEASIBILITY FOR A CAPTIVE PPA



# SUMMARY

## RENEWABLES HAVE A ROLE IN THE MODERNISATION OF AFRICA'S ENERGY SUPPLY MIX



Security of supply is key for the mining industry



LoM uncertainty could be a driver for innovation



Industry must be part of the solution to Africa's energy challenges



Raising capital can be difficult and/or expensive due to sovereign ratings



Governments need to provide an enabling environment



Mining companies need to embrace Shared Value concepts



Renewables can offer industry power cost relief and security of supply



Mines could run off renewables and low-carbon alternatives, while reducing their carbon footprint



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