



In association with



Lightsource

4th Annual Renewables for Mining Toronto Summit

Hear from global leaders in
mining and renewables including:**Nick Boyle**
CEO
Lightsource Renewable
Energy**Kim Rudd**
Parliamentary Secretary
to the Minister of Natural
Resources
Government of Canada**Kevin Dsouza**
Vice President, Sustainability
& Environment
Centerra Gold**Russell Blades**
Senior Manager, Energy
and GHG
Barrick Gold**Frank Roberto**
Chief Metallurgist
Newmont Mining**Andrew Drager**
Managing Director
Juwi Renewable Energy**John Carson**
CEO
Alterra Power**Stephen Letwin**
President and CEO
IAMGOLD**Heymi Bahar**
Renewable Energy Markets
Analyst and Project Manager
International Energy
Agency**Tsakani Mthombeni**
Group Head of
Energy & Carbon
Gold Fields**Terry Lynch**
President
Chilean Metals**Ian Brodie-Brown**
President and CEO
AurCrest Gold**Kerry Adler**
President and CEO
SkyPower Global**Duane Parnham**
Chairman of the Board
Giyani Gold**Tony Lord**
Director, Asset and
Energy Management
New Gold**Ron Little**
President and CEO
Orezone Gold**Valerie Helbronner**
Partner
Torys LLP**Thomas Qvist Vestesen**
CEO
Danvest Group

New for 2016



Global focus with case studies and market updates on renewables for mines in Africa, Australia, South America and North America



10 new international renewables for mines case studies to be presented



The first annual awards and global rankings for renewables for mines to be announced at the Congress



Electric vehicles in mining: operational insight, migration strategies and financial business case



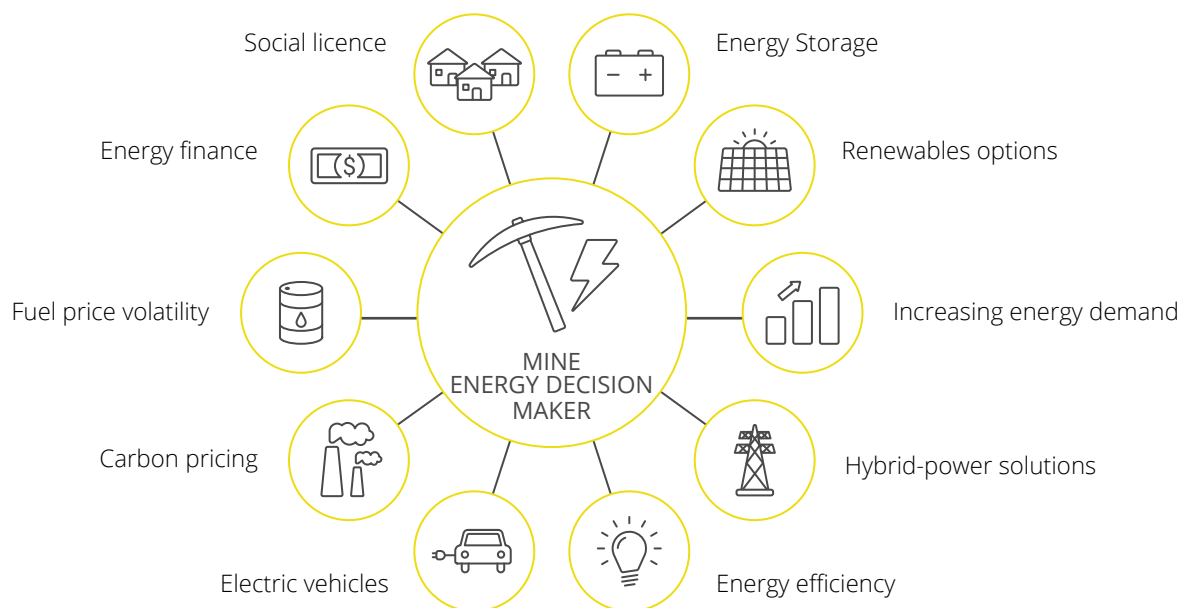
Insight on how carbon pricing is shaping energy strategies and shifting power choices for mines



Organized networking to facilitate introductions to mining and renewables experts



Where Mining Meets Renewables to Address Key Energy Challenges



Key Reasons to Attend

- Understand the global opportunity for renewables for mines with insight on North American, South American, African and Australia mining markets
- Meet with senior mining leaders currently exploring alternative energy options for new and operating mines
- Learn from 10+ new international case studies of mines incorporating renewable energy and storage systems into their power supplies
- Benefit from facilitated networking sessions to connect mining and renewables experts
- Get the updates on how traditional diesel suppliers are adapting their offerings to mining customers
- Hear how microgrid experts are evolving their business models to meet the needs of the resource sector
- Plus gain insight on critical topics for mining energy decision-makers including electric vehicles and carbon mitigation

"The Energy and Mines Toronto event opened my eyes to renewable energy possibilities that exist for mining projects. A great forum for dialogue with users and key potential partners."

– **Keith Boyle, COO, Chieftain Metals**

"The roundtable provided a forum for corporate energy managers to compare strategies and challenges in a non-sales environment."

– **Bill Allemon, VP-Energy & Electrical Asset Management & Reliability, AngloGold Ashanti**

"Definitely a great conference with a matchup of both renewable developers and storage options for mining companies to review. A premium event to see the latest innovations in both the on grid and off grid opportunities."

– **Bill Fisher, Executive Chairman, GoldQuest Mining**

ENERGYANDMINES
RENEWABLES IN MINING
AWARDS 2016MONDAY 21 NOVEMBER
6:15 - 9:00
HILTON TORONTO

The Energy and Mines Renewables in Mining Awards ceremony will take place on the evening of November 21st at Hilton Toronto. Come and celebrate leadership and innovation in renewables in the mining sector at this gala awards dinner.



Awarded to the mining CEO who has demonstrated energy leadership and a strong commitment renewable energy



Awarded to the mine and developer to acknowledge an innovative and pioneering renewable energy project for a mining operation that commenced in 2016



Awarded to the mining company for the use of solar thermal technology to power mine operations



Awarded to the mining company that has showed the most effective and innovative use of electrical energy storage at a mine site



Awarded to a mining company for the best use of wind power for mining operations
> 100 MW, < 100 MW



Awarded to a mining company for the best use of solar PV for mining operations
> 100 MW, < 100MW



Awarded to the mining company for innovation and deployment of renewables for non-operational facilities (e.g. offices)



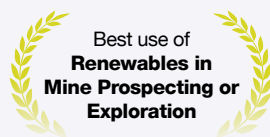
Awarded to the mining company showing innovation and commitment to renewables in mine transportation



Awarded to the mine, developer or similar agent for innovation, achievement and leadership in the use of renewable energy on a reclaimed mine site



To reward a renewables project for a mine that has also boosted community engagement and social license



To recognize innovation and leadership in the use of renewables for mine exploration, prospecting or early mine development. This award will be presented to the mine and the technology provider

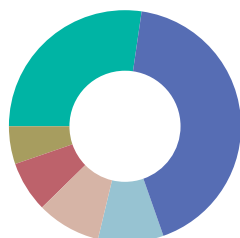


Awarded to a mining company that has the most ambitious or laudable public commitment to renewable energy

For more details about the Awards, please visit worldcongress.energyandmines.com



Previous attendee breakdown



Agenda at a Glance

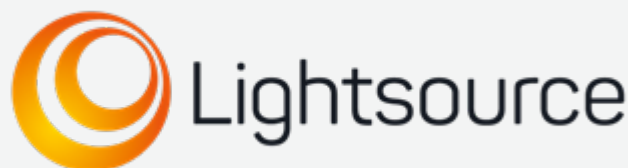
November 20: Workshop	November 21: Day 1	November 22: Day 2
An Essential Introduction to Mining for Renewables Professionals	The Role of Renewables in Driving the Competitiveness of Mines	Mining Energy Innovation and Transformation
Understanding the Basics of Mining	International Case Studies of Renewables for Mines	Spotlight on Africa: Energy Affordability and Security for Mines
Energy Requirements in Mining	Energy and Mines and Carbon Pricing	Mining Microgrids: Insight from Traditional Power Suppliers
CSR: Social and Environmental License	Adapting Renewables to Miners' Power Demands	Repurposing Mine Lands with Renewables
Dealing with Renewables and Mining "Case Study"	Reducing Diesel and Carbon for Remote Canadian Mines	Developing Collaborative Finance Models for Mining Microgrids
Opening Drinks Reception	Energy and Mines Renewables in Mines Awards 2016	Realizing the Benefits of Electric Vehicles for Mines
		Energy Storage for Mines

Hear from leading mining and energy experts including:





In association sponsor



Lightsource was founded in 2010 and has achieved an unrivalled track record in the installation of both ground mount and rooftop solar projects. Currently the leading solar photovoltaic (PV) energy generator in the UK and Europe, and one of the top ten largest solar PV energy generators globally, Lightsource has deployed more than £2 billion of solar assets and manages an operational portfolio of more than 1.3 Gigawatts– enough to power more than 350,000 households each year.

Lightsource finances, develops, constructs and operates utility-scale solar power stations and also supplies renewable power at a discounted rate direct to major energy users (MEUs) via its Power Purchase Agreement (PPA) model. Its in-house team of experts offer full service capability from initial design and planning through to ongoing operations and maintenance.

Sponsors and Exhibitors


Advisian
WorleyParsons Group


Congress Partners





Why sponsor Energy and Mines 2016?

Energy and Mines works collaboratively with you to create a marketing and thought-leadership solution that meets your objectives with the global mining, renewables and finance sectors.

Whether it is through one of our packages, or a bespoke solution, we will ensure you meet your company's objectives with this growing market segment.

Key reasons to sponsor or exhibit at Energy and Mines World Congress:



Reach the top energy buyers from global mining operations – 27% of 2015's attendees and over 40% expected in 2016



Position your company as a Thought-Leader with global mining and renewables experts



With 300 daily hits, Energy and Mines news site & biweekly newsletter are the ideal platforms to reinforce your message with mining and renewables leaders



Build your profile with senior mining, renewables, and finance experts



47% of sponsors and exhibitors repeat their sponsorship annually



Take advantage of our premium matchmaking service offering exclusive one-on-one meetings with prospective clients and partners



Establish your profile as a market leader by sponsoring an Energy and Mines Award at this year's inaugural ceremony



Reach a global audience of mining and renewables leaders with attendees from 5 continents coming to Toronto

To learn more about our partnership opportunities and how our customized solutions can help you achieve your business needs and objectives, please contact:

Mike Greenwood,
Head of Strategic Partnerships,
Energy & Mines

Direct: +1 613 680 2484

Mobile: +1 613 355 6616

mike.greenwood@energyandmines.com

To learn more about our partnership, please visit
<http://worldcongress.energyandmines.com/sponsors/>





AN ESSENTIAL INTRODUCTION TO MINING FOR RENEWABLES PROFESSIONALS

Pre-Summit Workshop: November 20, 2016

ESSENTIAL INTRODUCTION TO MINING FOR RENEWABLES PROFESSIONALS

NOVEMBER 20TH - HILTON TORONTO

9.00 UNDERSTANDING THE BASICS OF MINING

- Minerals, metals, ore and mine lifecycle
- Exploration, reserves and resources
- Blasting, hauling and comminution
- Concentration, leaching, smelting and refining
- Commodities transport and mining ports

10.40 BREAK

11.00 ENERGY REQUIREMENTS IN MINING

- Open pit mining energy demand
- Underground mining energy demand
- Off-grid vs on-grid energy requirements
- Energy use for water and ancillary tasks
- Requirements and future demand trends

12.30 LUNCH

13.00 CSR: SOCIAL AND ENVIRONMENTAL LICENSE

- Miners, job roles and company organization
- Environmental aspects in mining
- Mine closure and reclamation
- CSR & COP21
- The most successful mine-renewables projects

14.40 BREAK

15.00 DEALING WITH RENEWABLES AND MINING

- Mineral and metals economics and valuation
- Current commodity markets and trading
- Renewables allocation in mining
- Case study on renewables for mining

16.45 CLOSE

18.00 OPENING DRINK RECEPTION

Workshop Registration:

Participants can register workshop online or by contacting Sukhee Chae at Energy and Mines.

For questions or additional details contact:

✉ sukhee.chae@energyandmines.com

☎ +1 613 627 2787

Previous workshop attendees include:

MACCAFERRI

EMC

EDC

GP JOULE

HOLLING

GDF SUEZ

ENGIE

VIESMANN

DR

ENERCON

Doppelmayr

Gamesa

CATERPILLAR

CanadianSolar

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

SOLARRESERVE

GILKES

CPV

BayWa

ABENGOA

SULLIVAN & WORCESTER

nrg

RIJN CAPITAL

BARRICK

SIEMENS

Trust

Norconsult

Panasonic

S&C ELECTRIC COMPANY

Excellence Through Innovation

SUNCO

Narada

DIGITAL ENGINEERING

LABORELEC

CHIYODA CORPORATION

ANTARES

SUNWODA

VIZIMAX



About the workshop leader

Arnoldus Mateo van den Hurk Mir, Ph D.

For 30 years, Arnold has been as an adviser and professional in geo-mining, renewable energy, company appraisal and financial analysis. He has worked in Europe, South America, the Caribbean, Africa and China. He has wide knowledge and experience in both the renewables and mining sectors. He is passionate about connecting these two sectors to improve the efficiency of mining.

Agenda

DAY 1: NOVEMBER 21

ENERGYANDMINES



TORONTO
21-22 NOV.

WORLD
CONGRESS

In association with
Lightsource

8.00 Coffee & Registration

8.15 Chair's Opening Remarks

Adrienne Baker, Director, Energy and Mines

8.20 Opening Welcome

Nick Boyle, CEO, Lightsource Renewable Energy

8.25 Welcome Address: Building a Roadmap for Sustainable, Low-Carbon Energy for Mines

Kim Rudd, Parliamentary Secretary to the Minister of Natural Resources, Government of Canada



8.40 Keynote: Why Renewables Are Beginning to Make Sense for Miners

Donald Bubar, President and CEO, Avalon Advanced Materials

THE ROLE OF RENEWABLES IN DRIVING THE COMPETITIVENESS OF MINES

9.00 Keynote Session: The Role of Renewables in Driving the Competitiveness of Mines

Rising energy costs are hampering the competitiveness of the resource sector and the prolonged commodity price low has intensified the focus on driving down and controlling power costs. In addition, the sector is being challenged by increased social opposition and regulatory demands which can be addressed by alternative energy choices. This keynote session will look at how renewables can increase the effectiveness of the resource sector by delivering affordable and sustainable power options.



9.00 Keynote: Understanding how Renewables fits with Mining's Strategies Today

- Understanding the drivers behind mine electrification and renewables integration
- Exploring the benefits of power price stability and storage integration
- How do renewables fit with mining's broader corporate strategies?

Russell Blades, Senior Manager, Energy and GHG, Barrick Gold



9.20 Keynote: How are Renewables Changing the Global Energy Landscape?

- Shifting technology and geographical drivers of renewable power deployment
- Understanding the cost effectiveness of different renewable power technologies
- Why is it important for mines to start the energy transformation towards renewables?

Heymi Bahar, Renewable Energy Markets Analyst and Project Manager, International Energy Agency



9.40 Keynote: Adapting Renewables to Fit with Mining's Business Model

Nick Boyle, CEO, Lightsource Renewable Energy

10.00 Networking Break



10.30 Keynote Panel: The Role of Renewables in Increasing the Competitiveness of Mines

- How has the prolonged commodities low affected the energy strategies of mines?
- Do miners see renewables as a competitive option to conventional power?
- What are the triggers for and main benefits of renewables for mines today?
- Why aren't these benefits being fully realized: what are the key barriers to adoption?
- Why is it important to act now in adopting renewable energy to realize the full benefits?
- How do renewables leaders view business development opportunities with mines?
- How do miners view the different approaches and business models of renewables providers?
- What opportunities are there for mines to invest in renewables outside of operational needs?
- How will the commodity price recovery change the energy portfolio of mines?
- Views on the critical next steps for realizing the full potential of energy innovation for mines

Chair: Michael Amm, Partner, Torys LLP

Terry Lynch, President, Chilean Metals

Duane Parnham, Chairman of the Board, Giyani Gold

Kerry Adler, President and CEO, SkyPower Global

John Carson, CEO, Alterra Power

INTERNATIONAL CASE STUDIES OF NEW RENEWABLES HYBRIDS FOR MINES

Session 1: Renewables Hybrids for Mines: New International Case Studies

The business case for renewables and storage for mines is strongest for diesel-reliant, remote operations with longer mine lives. Today remote mines across the globe are integrating these solutions and also finding innovative ways to work with independent power producers to address mine life challenges through customized PPAs and funding options. This session will showcase the very latest international case studies of renewables hybrids for mines in development and operation.



11.20 Case Study: Hybrid Solar/Thermal Power for Essakane Mine

With a 5 MW solar project already in operation at its Rosebel mine in Suriname, IAMGOLD is working to complete a deal for a 15MW solar project as an adjunct to its 57 MW thermal power plant at its Essakane Mine in Burkina Faso.

- Reviewing alternative energy options for Essakane – key challenges and opportunities
- The hybrid solar/thermal power solution and the benefits
- Looking at 15% of power generation from renewables in the next 2 to 3 years

Stephen Letwin, President and CEO, **IAMGOLD**



11.40 Case Study: Building Community Relationships through Renewables Partnerships

AurCrest Gold, an Ontario-based junior mine, is developing a 40 MW renewables project with Cat Lake First Nation.

- Details on this unique project to provide power for the mine site and surrounding community
- Insight on the mine's broader strategy to build partnerships to develop renewables to power remote First Nations communities and mine sites
- Next steps in project development and community engagement around renewables

Ian Brodie-Brown, President and CEO, **AurCrest Gold**



12.00 Case Study: The Benefits of Integrating Renewables into Community Development

Centerra Gold developed an innovative community development program in Kyrgyzstan by providing local communities with solar technologies to provide economic opportunities and address water scarcity in the region. Both initiatives were unrelated to core mining activities but instrumental in boosting social license to operate and reputational value.

- Details on this unique project and the benefits of using renewables to boost social license

Kevin Dsouza, Vice President, Sustainability & Environment, **Centerra Gold**

12.20 Networking Lunch

ENERGY AND MINES AND CARBON PRICING

1.20 Session 2: Energy and Mines and Carbon Pricing

As more mining jurisdictions move towards implementing carbon pricing mechanisms, carbon exposure is emerging as a top concern for mining operators. Preparing for compliance with carbon emissions trading schemes and taxation is one of the most complex and challenging tasks for miners, especially those operating in a variety of jurisdictions. This session will explore how mines are addressing carbon risk and offer insight into how renewable energy will play a role in offsetting exposure.



1.20 Keynote: Understanding how the Transition to a Low-Carbon Future Affects Mining

1.40 Introducing a Shadow Price on Carbon and the Impacts on Energy Decisions

Frank Roberto, Chief Metallurgist, Newmont Mining, **Newmont Mining**



2.00 Panel Discussion: Energy and Mines and Carbon Pricing

- What would miners like to see from carbon pricing mechanisms?
- What are some examples of the potential financial impacts of carbon trading for mines?
- How are mines managing carbon monitoring, reporting and pricing compliance internally – what sort of resources are being dedicated to these processes?
- How are miners linking energy choices and carbon mitigation for global operations?
- How is carbon pricing in a given jurisdiction influencing energy for a specific mine site?
- Are mines considering moving smelting and other processes to avoid carbon exposure?
- Is there a competitive advantage to be gained from moving to low-carbon energy choices before a formal price on carbon has been established?
- How can the resource and renewables sectors work together to foster best practices in climate mitigation and low-carbon energy choices?

Chair: **Paul Ebert**, Senior Principal - New Energy, **Advisian**

Exequiel Rolon, Sustainable Development Manager, **Fresnillo**

Michiel ten Hoopen, Head of Advisory and Offset Development, **ClearBlue Markets**

Frank Roberto, Chief Metallurgist, **Newmont Mining**

2.50 Networking Break

ADAPTING RENEWABLES TO MINING'S POWER DEMANDS



3.20 Session 3: Adapting Renewables to Miners' Power Demands

In order for more projects to move forward, the renewables sector needs to adapt its model to better fit with the current power systems of the mining sector. This panel will bring together energy leaders from the mining sector with renewable energy developers specializing in new hybrid solutions to discuss how renewables can better fit with mining's current energy system.

- Insight from mining energy leaders on their current energy challenges and strategic initiatives
- How are renewables succeeding and failing to fit with mining's current power systems?
- How are hybrid providers evolving to meet the load profiles and power demands of mines?
- Is the power intermittency of renewables still a concern for mining energy decision-makers?
- What are some of the strategic and technical innovations for hybrids that will interest mines?
- How can mining energy leaders and renewables experts collaborate on solutions?

Chair: **Valerie Helbronner**, Partner, **Torys LLP**

Tony Lord, Director, Asset and Energy Management, **New Gold**

Luis Contreras, Environmental and Social Responsibility Manager, **KGHM Chile**

Robin Adamson, Director of Business Development, Microgrid & Hybrid Solutions, **Canadian Solar**

Thomas Qvist Vestesen, CEO, **Danvest Group**

Peter Lilienthal, CEO, **Homer Energy**

REDUCING DIESEL AND CARBON EMISSIONS FOR REMOTE CANADIAN MINES

4.10 Session 4: Reducing Diesel Reliance and Carbon Emissions for Remote Canadian Mines

Evolving federal and provincial energy and climate policies and the ongoing rise of diesel power costs are reinforcing the business case for renewables integration for remote Canadian mines. This session will provide an overview of key policy developments and opportunities for renewables integration with Canada mines.



4.10 Case Study: Designing a Zero Capex Strategy for Diesel-Savings with Renewable Power

This case study will showcase a new wind hybrid project in development for a Canadian mining operation which offers no initial capex investment for the mine.

Nicolas Seguin, Head of Business Development, **TUGLIQ Energy**

Agenda

DAY 1: NOVEMBER 21

ENERGYANDMINES



TORONTO
21-22 NOV.

WORLD
CONGRESS

In association with
Lightsource

4.30 Panel Discussion: Reducing Diesel and Carbon Emissions for Remote Canadian Mines

- How are evolving climate and energy policies impacting remote power choices?
- Do miners see renewables as a competitive option to diesel power?
- How has low oil and commodity pricing affected the current economics of renewables?
- How much do other factors impact diesel costs– i.e. transportation, taxation, etc.?
- What concerns do mine operators have around the intermittency of renewables solutions?
- What other social, environmental and logistical benefits come from diesel-abatement?
- What type of carbon reduction strategies are mines developing and how is this affecting energy?
- How will the energy strategies of remote operations change in the near-term?

Chair: **Michel Carreau**, Director, Energy, **Hatch**

Keith Boyle, Chief Operating Officer, **Chieftain Metals**

Loic Didillon, Environmental Professional, **Tata Steel**

James Paterson, CEO, **Kivalliq Energy**

Catharine Farrow, CEO, **TMAC Resources**

5.20 Conference Day 1 Close

ENERGYANDMINES
RENEWABLES IN MINING
AWARDS 2016

6.30 Energy and Mines Renewables in Mining Awards Reception & Dinner

This inaugural Awards will recognize those renewables and mining leaders that have made an exceptional contribution to renewables for mines. Winners will be chosen through a combination of Energy and Mines Rankings; a formal nominations process and jury selection. Awards will be presented at this gala reception and dinner.



8.25 Chair's Opening Remarks

Adrienne Baker, Director, Energy and Mines

MINING ENERGY INNOVATION AND TRANSFORMATION



8.30 Case Study: Delivering Operational Savings with a PV-Storage Hybrid Solution

Sandfire Resources has invested in a 10.6 MW solar PV farm that will include battery storage for its the DeGrussa Copper-Gold mine in Western Australia

- An update on this innovative hybrid solution
- Optimizing PV, storage and fuel to ensure the mine's need for spinning reserve
- How does this project pave the way for further uptake of renewables by remote mines?

Andrew Drager, Managing Director, juwi Renewable Energy

8.50 The Future of Energy for Mines: Renewables Transformation and Acceleration

SPOTLIGHT ON AFRICA: ENERGY AFFORDABILITY AND SECURITY FOR MINES

9.10 Session 5: Spotlight on Africa: Energy Affordability and Security for Mines

Africa is one of the regions where partnerships between miners and renewables IPPS and technology providers makes the most sense. Across the continent, mines are struggling with rising energy costs and unreliable power. Renewables hybrids for remote and grid-tied mines offer both price stability and security to African mines. Additionally, these investments create a legacy asset for surrounding communities. This session will focus on the opportunities for mines and renewables to work together to solve energy challenges across the continent.



9.10 Keynote: The Role of Alternative Energy in Addressing Mining's Energy Challenges

- For grid connected mines, could renewables become primary supply with grid as back-up?
- Insight from Gold Fields' 40 MW PV project for South Deep operation
- Are renewables the panacea of mining energy security?

Tsakani Mthombeni, Group Head of Energy & Carbon, Gold Fields

9:30 Networking Break



10.00 Panel Discussion: The Role of Renewables in Addressing Mining's Energy Challenges in Africa

- Insight from mining leaders with African operations on current operational energy challenges
- How are mines addressing these power issues and what role could renewables play in the process?
- What has been the impact of lower oil pricing on the economics of alternative power?
- When running the business case for hybrid power, what are the main hurdles for implementation?
- What would unlock those barriers and allow mines to move forward with new energy solutions?
- How would miners like to see financing structured for hybrid solutions for mines?
- What role can Governments and development banks play in these supporting alternative power options for the resource sector?
- Development and electrification - a leverage for mining power autonomy

Ron Little, President and CEO, Orezone Gold

Tsakani Mthombeni, Group Head of Energy & Carbon, Gold Fields

Francois Auclair, CEO, Algold

Erwin Spolders, CEO, Redavia

Ryan Hairsine, Senior Project Engineer, Roxgold



MINING MICROGRIDS: INSIGHT FROM TRADITIONAL POWER SUPPLIERS



10.50 Session 6: Mining Microgrids: Insight from Traditional Power Suppliers

Recognizing the global demand for more affordable and sustainable power options, major diesel generator suppliers are now looking to develop hybrid solutions to provide mining clients with renewable power options. This session will bring together traditional power suppliers to discuss their different approaches to hybrid energy solutions and provide insight on how they see the energy profile and demands of miners changing.

- What sort of feedback have you had from mining clients on their energy challenges and the solutions they are considering?
- How are you approaching the renewables hybrid business – how does this fit (or not) with your current business model?
- What role do you see for partnerships with renewable energy developers and technology providers?
- Where do you see the most potential for renewables microgrids with current mining clients?
- What are the most common barriers for mines when considering adopting hybrid solutions?
- How do you see the power landscape for mines changing in the near-term?

Akram Elhenawy, Global Key Accounts Manager, **Caterpillar Microgrid - Electric Power Division**

Satish Jayaram, Global Energy Ventures, **Cummins**

Jason de Carteret, Business Development, Africa, **Aggreko**

Mark Kennedy, Business Development Manager, **Wärtsilä Canada Incorporated**

REPURPOSING MINE LANDS WITH RENEWABLES

11.40 Session 7: Repurposing Mine Lands with Renewables – A Growing Market Opportunity

Redeveloping contaminated mine lands with renewable energy is one of the biggest market opportunities for the global renewable energy sector. According to Energy and Mines Global Rankings, currently there is 1000 MW of installed capacity of renewables projects in operation on former mine lands. For mines, there are legacy, social and financial benefits to repurposing sites with renewables and, for developers, this is an exciting market opportunity that opens up new sources of funding and support.



11.40 From Mining to Wind Power: Realizing the Benefits of Legacy Projects

James Spencer, President and CEO, **EverPower Wind Holdings**



12.00 Joint Case Study: Redeveloping Mine Lands for Solar PV

Peter Pedersen, Managing Principal, **Brightfields Development**

12.20 Panel Discussion: Repurposing Mine Lands with Renewables – A Growing Market Opportunity

- What are the main benefits for mines of integrating renewables into site rehabilitation plans?
- How do these projects differ from greenfield sites for project developers?
- What potential risks and liabilities should developers be aware with these sites?
- Is carbon pricing expected to drive more projects as mines look to offset emissions?
- What are some examples of local and national funding sources for these projects?
- What role are local governments playing in supporting wind and solar on contaminated lands?
- How should developers begin to access this growing market opportunity?

Gail Mosey, Senior Energy Analyst, **National Renewable Energy Laboratory**

James Spencer, President and CEO, **EverPower Wind Holdings**

Peter Pedersen, Managing Principal, **Brightfields Development**

1.10 Networking Lunch

DEVELOPING COLLABORATIVE FINANCE MODELS FOR MINING MICROGRIDS

2.00 Session 8: Developing Collaborative Finance Models for Mining Microgrids

Finding lenders and workable models for renewables hybrids for mines has been a challenge. The biggest hurdle for renewables project uptake by the mining sector is the long-term nature of traditional power purchase agreements and the upfront capital costs, especially in this time of prolonged commodity lows. These projects tend to be too small to attract traditional banks and often carry more risk in terms of the creditworthiness of the offtaker and the PPA terms. This session will offer candid insight from mining finance leaders and lenders on developing investment models for mining microgrids.



2.00 Exploring Finance Solutions for Mining Microgrids

Thomas Hillig, Founder, **THEnergy**



2.15 Panel Discussion: Developing Collaborative Finance Models for Mining Microgrids

- What are the current financial priorities and cost concerns for mining finance leaders?
- How would mining leaders assess the business case for renewables?
- What are your views on the different finance models for these energy projects?
- What are the inherent risks associated with mining hybrids that can deter investment?
- How is the prolonged commodity low impacting the financiability of these projects?
- How are finance models evolving for renewables projects for mines including portfolios, synthetic PPAs?
- What flexibility can be built into contracts to address variable energy usage and mine closure?

Louis Kent, Senior Manager, **Energetics**

A Representative, **Economic Development Canada**

3.00 Networking Break

REALIZING THE BENEFITS OF ELECTRIC VEHICLES FOR MINES

3.30 Session 9: Realizing the Benefits of Electric Vehicles for Mines

With over 90% of the world's mines being open cast and often located in remote regions where diesel transportation costs are prohibitive, mines are actively exploring electric vehicles to cut diesel costs and improve air quality. The electrification of the resource sector will increase its competitiveness and sustainability but there are challenges to overcome including the upfront capex of these technologies before they become business as usual. This session will provide insight on the benefits and challenges of electric vehicles for mines.



3.30 Case Study: Testing the Performance of Electric Underground Mining Vehicles



3.50 Panel Discussion: Realizing the Benefits of Electric Vehicles for Mines

- What are the main drivers for mines moving to electric vehicles?
- How does electrification fit with renewables integration for mines?
- How are mines currently testing these technologies and what have the results been?
- What should the expectation be in terms of diesel savings?
- How much can these technologies reduce carbon and other harmful emissions?
- What are the main barriers for mines investing in electric vehicles?
- What sort of infrastructure is required when you electrify mine transportation?
- What is the average capex of these vehicles and the typical payback period?
- What are the latest innovations in the technologies that will result in more uptake?

HOW WILL ENERGY STORAGE IMPROVE MINING'S ENERGY LANDSCAPE?

4.35 Session 10: How will Energy Storage improve Mining's Energy Landscape?



4.35 Current Status and Outlook for Energy Storage for Mines

- An overview of storage technologies, pricing trends and applicability for mining microgrids
- Cosmin Laslau**, Senior Analyst, Energy Storage Intelligence Service, **Lux Research**





4.50 Panel Discussion: How will Energy Storage improve Mining's Energy Landscape?

- How and when will energy storage transform the applicability of renewables for miners?
- Expert views on the current status and outlook of energy storage for mining microgrids
- What are the key applications for energy storage in a mining microgrid?
- What challenges need to be overcome to realize the full potential of storage for mines?
- What recent innovations will drive further integration of storage for these hybrid systems?
- What should miners expect in terms of diesel reductions when integrating storage?
- Insight on how storage can assist with grid balancing and stabilization for grid-tied operations

George Hanna, Managing Director, **Qinous**

Mike Grunow, Vice President of Marketing, **ViZn Energy Systems**

Richard Boudreault, Executive Chairman, **Sigma Energy**

Bill Sproull, VP Business Development & Sales, **ESS**

Steve Scharnhorst, CEO, **Fluidic Energy**

5.40 Chair's Closing Remarks

Adrienne Baker, Director, **Energy and Mines**



THREE WAYS TO REGISTER



+1 613 627 2787



sukhee.chae@energyandmines.com



worldcongress.energyandmines.com

Special rates available for mines, group bookings and members of supporting partners.

Complementary passes to mine energy-decision makers.

Contact sukhee.chae@energyandmines.com for details.