Sell-side analyst visit – Coal ESG
1 November 2018
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The Glencore perspective on carbon and climate

- We support reducing global carbon emissions and acknowledge the COP21 climate goal of the less than 2°C global leaders have pledged to achieve.
- We want to see a least cost approach to achieving climate goals.
- There is a significant gap between the economic and energy reality and climate target scenarios.
- Industrialisation and urbanisation of developing economies, particularly in Asia, will continue to drive significant growth in global energy/electricity/steel/cement and industrial demand which will continue to largely be met by coal, oil and gas for the foreseeable future.
- While it may no longer be predominant - under most scenarios, coal will play a major role as key input to industrial processes as a competitive, safe, secure and reliable baseload source of energy.
- The aim of climate and energy policy must be to reduce CO₂ emissions in the most cost effective manner whilst ensuring energy security.
- All climate scenarios recognise the deployment of carbon capture and storage technology (CCS) is essential across all fossil fuel processes to achieve emissions reduction and climate goals—this needs to be supported by global policy.
- The achievement of climate goals has to consider the ongoing use of coal—policy needs to drive the use of high efficiency low emission (HELE) technology, which delivers up to 35% less emissions than older technology.
Coal remains a key input for industrial sectors and a critical source of safe, reliable and secure energy.

- 1 billion people have no access to electricity\(^1\)
- 2.7 billion (40% world) rely on traditional fuels for cooking\(^1\)
- Non-OECD projected economic growth of 4.5%; extensive urbanisation still to occur

• More than 1000 pages, with 133 contributing authors, 6000 scientific references and 42001 comments\(^{(1)}\)

• Global climate related risks for natural and human systems of a 2 degrees temperature change are greater than 1.5 degrees\(^{(2)}\)

• Assesses scenarios / possible hypothetical pathways to limit global warming to 1.5 degrees:
  - Acknowledges some pathways show potential “trade-offs” in terms of key SDGs 1 (poverty), 2 (hunger), 6 (water) and 7 (energy access)\(^{(3)}\)
  - “Redistributive policies across sectors and populations … can resolve these trade-offs” \(^{(4)}\)

• These scenarios are neither reflected in the Paris NDC’s nor in actions on the ground\(^{(5)}\)\(^{(6)}\)

• Ongoing development imperatives (poverty etc.) and policy direction in developing countries supports the thesis and reality of ongoing coal build\(^{(5)}\)

• IPCC paths rely on carbon removal\(^{(7)}\) - as such it is supportive of the idea if IEA NPS type outcome prevails, CCS will be critical to limiting climate change \(^{(5)}\)
The IEA New Policy Scenario for 2030 shows an increase in the use of coal in absolute terms compared to 2016.

<table>
<thead>
<tr>
<th>2016 Actual</th>
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<tbody>
<tr>
<td>• 81% of primary energy demand from coal, oil and gas</td>
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<td>• 1.6% primary energy from new renewable energy despite $2.0 trillion investment since 2010</td>
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<tr>
<th>2030 New Policy Scenario – Government ambition</th>
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<tr>
<td>• Energy demand to 2030 still grows by 16%</td>
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<tr>
<td>• 77% of primary energy demand from coal, oil and gas</td>
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<tr>
<td>• Includes Paris Agreement Nationally determined contributions (NDCs) and subsequent policy</td>
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<td>• 7.1% of primary energy demand from renewables (including hydro)</td>
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<th>2030 SDS – required targets to meet Paris Agreement</th>
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<tbody>
<tr>
<td>• Energy demand in 2030 no higher than today</td>
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<tr>
<td>• 72% of primary energy demand from coal, oil and gas</td>
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<tr>
<td>• 11% of primary energy demand from renewables*</td>
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<td>• 21GW pa of CCS capacity must be installed from 2030</td>
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<table>
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<th>2030 IPCC – required targets to meet 1.5°C</th>
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<tr>
<td>• P3 – no or low overshoot</td>
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<td>• middle road scenario in which societal and technological development follows historical patterns</td>
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<td>• BECCS rollout from 2040; 15Gt CO2/yr by 2080</td>
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**Global primary energy demand (Btce)**

<table>
<thead>
<tr>
<th>2016 Actual</th>
<th>2030 New Policy</th>
<th>2030 SDS</th>
<th>2030 IPCC P3</th>
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<tbody>
<tr>
<td>19.7Btce</td>
<td>22.9Btce</td>
<td>19.8Btce</td>
<td>19.1Btce</td>
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**Notes:***

1. Source: IEA WEO 2017 and IPCC SR15 (Oct 2018), Btce billion tonnes of coal equivalent – standardised coal quantity using coal with energy content of 7000 kcal/kg or 29.31 GJ/t
2. Physical tonnes
3. SDS: Sustainable Development Scenario
South-east Asia will drive future Economic growth and demand for coal from Australia
South-east Asia energy demand outlook

- South East Asia region economy will triple in size by 2040
- Urban population set to grow by over 150 million people by 2040
- Energy demand will grow by almost two thirds to 2040
- Coal will account for 40% of energy growth
- Total coal demand more than doubles by 2040
- Demand for high quality thermal and coking coal will rise
Coal fired power generation is included in the Paris commitments of 24 countries responsible for more than 50% of global emissions

- **India**
  - New coal units totaling 64GW, 43GW under construction
  - 143Mt coal demand

- **Vietnam**
  - New coal units totaling 19GW, 11GW under construction
  - 33Mt coal demand

- **Japan**
  - New coal units totaling 63GW, 5GW under construction
  - 12Mt coal demand

- **Philippines**
  - New coal units totaling 6.6GW, 4.6GW under construction
  - 14Mt coal demand

- **South East Asia**
  - New coal units totaling 122GW, 81GW under construction
  - 260Mt coal demand

Source: NDC's, IEA WEO 2017 and Glencore analysis

(1) includes India and Pakistan coal demand calculated based on underconstruction capacity
Investment in high efficiency low emission (HELE) technology for coal plants provides pathway to lower carbon emissions

- New ultra supercritical plants can deliver up to 35% CO₂ reduction
- Also reduce SOx, NOx, PM by up to 67%
- HELE technology available as a plant upgrade or new build
- No shortage of finance from Asian banks, negating MLD’s (including World Bank) reluctance to fund coal

![Isogo Japan - 43% thermal efficiency](image-url)

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**Efficiency gains substantially reduce CO₂ emissions**

![Efficiency chart with CO₂ reduction](chart-url)
Costs of achieving a 2°C goal as a fraction of Global GDP (2010-2100)

- The median modelled cost of achieving a 450ppm target is estimated to rise to 5% of cumulative global GDP between 2010 and 2100, if CCS technology is not deployed.

- CCS is the single most influential class of technology for reducing the cost of achieving a 2°C goal given its broad applicability to electricity generation, industrial processes, synthetic fuel production, and bioenergy.
What is the Surat Basin CCS Project?

The Integrated Surat Basin Carbon Capture and Storage Project aims to assess and, if possible, demonstrate the safety and suitability of CCS in the region....

Read More
CTSCo (100% Glencore) is developing a ~180,000t integrated carbon capture, transport and storage project

- Capture plant to be located at one of 3 local coal power stations, all less than 15 years old
- Aim is to provide confidence that CO₂ can be safely stored for larger scale storage
- Majority of funding from Coal21 Fund (Australian black coal industry), Federal Government and ANLEC R&D

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PRE-FEASIBILITY STAGE 2009-2014
- Obtained a Greenhouse Gas Exploration Permit (EPQ7) from Queensland Government
- Granted Environmental Authority (EA) to drill wells, acquire seismic survey data, and construct access roads and other facilities
- Completed extensive analysis of existing Surat Basin data, the drilling of an exploration well, and the acquisition of new well data

FEASIBILITY / FEED STUDY STAGE 2014-2018
- Scientific verification work that the site is suitable for storing liquid CO₂
- Undertaking environmental baselines and further rock properties modelling – no injection to take place at this stage
- Examination of geological and environmental factors to provide a baseline for ongoing monitoring and comparison
- Preparation and seeking permit for test injection (maximum 180,000 tonnes over three-year period only)
- Continued open engagement local community, non-government organisations and government agencies

FID / CONSTRUCTION AND COMMISSIONING: 2018/19-2020/21
- Approval to construct a demonstration post-combustion capture (PCC) plant, linked to an existing power station in the region
- Construction of CO₂ Capture Plant
- Construction of in-field injection equipment at the site in Wandoan including:
  - One injection well into the Precipice Sandstone formation
  - 4 to 5 monitoring well slots into the precipice and shallower e.g. Hutton formation to detect for any potential leakage
  - Offloading facility with tankers to receive the liquid CO₂ from 4 to 5 trucks per day
  - Pipeline from offloading facility at the site to the single test injection well

TEST INJECTION STAGE 2020/21-2023/24
- Commence injection of liquid CO₂ – maximum of 60,000 tonnes per year for three years
- Continued monitoring and verification of the movement of CO₂ during the injection period
- Post injection ongoing monitoring

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• MOU with Intergen owned Millmerran Power Station (Huaneng 75% equity)

• Post Combustion Capture (PCC) plant design being undertaken by Huaneng Clean Energy Research Institute (CERI)

• A$3.5M in a three stage process contracted in March 2018 with CERI

• Plant design based on Huaneng’s Shanghai 120,000 tpa plant operating since 2009, with ~22,000 operating hours
Our approach to sustainability
Our sustainability pillars

<table>
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<tr>
<th>Health</th>
<th>Safety</th>
<th>Environment</th>
<th>Community &amp; Human Rights</th>
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<tr>
<td>Become a leader in protecting and improving the wellness of our people and communities</td>
<td>Become a leader in safety and create a workplace free from fatalities and injuries</td>
<td>Minimise any negative environmental impacts from our operations and apply the precautionary principle in decision-making</td>
<td>Foster socio-economic resilient communities and respect human rights everywhere we operate</td>
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SafeWork: promoting a risk-based safety culture

- In 2009, the Coal business developed the SafeWork initiative. This was rolled out in 2014 as a Glencore company wide initiative.

- All Glencore safety targets and programmes are now aligned with SafeWork, an initiative to change attitudes towards safety and bring about long-term sustainable change to eliminate fatalities and serious injuries.

- Focused on eliminating fatalities and serious injuries by identifying the hazards that cause fatalities within our operations and developing life-saving behaviors and protocols to target them.

- Analysing High Potential Risk Incidents (HPRI) is a key part of our program to put in place measures to prevent similar incidents.

Since the introduction of SafeWork in 2009, the coal business has seen significant improvement in its safety performance: 79% decrease in TRIFR, 64% decrease in LTIFR, 59% decrease in DISR
Implementing a safety leadership program

- Each site has clear safety improvement plans which are reviewed regularly by senior management.
- Intervention plans are implemented to address poor performers.
- In 2017, we strengthened our frontline safety leadership by focusing on:
  1. Leadership-led risk assessments and hazard identification.
  2. Compliance with SafeWork.
  3. Reporting and recording all incidents involving substandard risk and hazard analysis and non-compliances.
  4. Proactive steps to improve compliance with SafeWork procedures and standards.
We have World recognised, leading community HIV PPP program

- In South Africa, our business continues its collaboration with three local organisations, Re-Action!, Life Careways and Life Occupational Health, to advance its Employee Wellness Programme
- A focus has been to increase the number of HIV positive employees on care and treatment programmes
- In 2017, we formally extended the wellness programme to include a detailed financial wellness element to address the indebtedness challenge faced by employees
- As at the end of September 2018, of the 858 employees who are HIV positive, a total of 683 (80%) are registered in care and treatment program
• Focus is on land management and life of mine planning in order to deliver mine closure options that provide for sustainable post-mining land use and relinquishment of mining tenements.

• Each site has a annual rehabilitation plan and management have KPI’s in relation to quality and quantity.

• First two open cut coal mine certification in QLD ever at Rolleston (220 ha) and Newlands (73 ha).

• In 2017, Glencore hosted the ICMM mine closure working group in Australia which included a visit to our operations and an opportunity to share practices and shape the industry approach.

• Part of this planning process includes the treatment of final pits and we are taking steps to minimise the size or environmental impact of a final void.
Implementing a proactive approach to rehabilitation and mine closure planning

We own or lease c. 570,000 hectares, of which c. 55,000 hectares have been disturbed and c. 17,000 hectares rehabilitated.

Australia, Westside – Mine Closure

Australia, Mt Owen – rehabilitation

South Africa, Middelkraal – teff pasture

Colombia, Prodeco – rehabilitation nursery

Australia, Liddell – Cattle Grazing
Proactively responding to community concerns

Over the past five years, achieved a 72% reduction in community complaints since 2013 and a 33% reduction during 2017.

- The majority of our historical complaints relate to air and noise and the reduction reflects the continued focus on improving operational performance. Steps taken include:
  - Identifying effective noise management controls during the mine planning, assessment and operational phases. These include specific noise controls, minimising haul distances where practical and minimising the clearing of trees, bush and grass during construction work
  - Using automated systems to identify meteorological conditions likely to result in noise impacts
  - Avoiding placing operations on raised and exposed areas to minimise noise and dust generation
  - Planning for progressive and temporary rehabilitation
  - Setting aside sufficient water for dust suppression
  - Undertaking noise and air quality awareness training for employees

Control Centre at Bulga, Australia to manage noise, dust and blasting

Real time air quality monitoring at Prodeco, Colombia
Community engagement on a shared resource

- In 2010, in coordination with the NSW Minerals Council, the region’s miners established the Upper Hunter Mining Dialogue, to address community concerns related to the coexistence of mining with local infrastructure and services, land rehabilitation, water and air quality.
- The Dialogue, which Glencore currently chairs, brings together eight coal producers from the region and community and business leaders, environmental groups, residents, regulators and other industries.
- It is a collaborative effort, determining the biggest priorities for the local community, understanding its concerns and working together to develop and implement solutions to such top priorities.
- Some projects tackled have included air quality management, water management, rehabilitation and mine closure.
Environmental performance and proactive stakeholder engagement provides a competitive advantage

- We can demonstrate that we listen to general community concerns and address these through modifications to the mine plan or operational activity
- Our track record in environmental performance has shown that “we do what we say”

Bulga optimization project
Respecting human rights

Human rights due diligence of suppliers
In 2017, Prodeco engaged Fundación Ideas para la Paz (FIP) to undertake a human rights due diligence exercise on its suppliers. The exercise reviewed Prodeco’s ten most critical contractors.
An external readiness assessment of our Australia coal business was recently conducted in preparation for the proposed Australian Modern Slavery Act.

Working with security providers
In Colombia, critical contractors received training specifically on the rights of children and have Prodeco’s security employees attended a human rights workshop organised by the Universidad del Norte.

Human rights risk assessments
Prodeco and South Africa completed action plans to reduce and eliminate the gaps identified by a human rights risk assessment undertaken in 2016 and 2017 retrospectively.

Voluntary Principles workshop with Sustainability and Security teams, July 2018 facilitated by FIP
We continue to support efforts for peace in post-conflict areas

- In Colombia, Prodeco continues to participate in the development of Colombia’s National Plan on Business and Human Rights, led by the Presidential Advisory Office on Human Rights.

- Prodeco is also participating in the Energy Mining Committee (CME), an initiative of private companies, established to foster dialogue on the UN Voluntary Principles and their operational implementation.

- In September 2018, Prodeco participated in a ceremony at the Estados Unidos village, in the municipality of Becerril. The community presented a homage for the victims of the armed conflict in this community of Cesar.
Supporting territorial peace in Colombia

**Local capacity building**
- Established a Diploma in Territorial Peace and Capacity Building of Civil Society and Official Entities (in partnership with the Cesar Development and Peace Programme)
- Territorial and institutional strengthening of the project
- Strategic social dialogues
- Together for Peace youth group

**Corporate Peace Culture**
- Training in human rights and peace related topics to our employees and contractors

**Responsible Management**
- Human rights-focused risk analysis
- UN Guiding Principles on Business and Human Rights
- UN Voluntary Principles on Security and Human Rights

**Entrepreneurship for Peace**
- Agricultural projects in lands not used for mining
- Environmental offset programmes
Increasing transparency with downstream stakeholders

There is increasing pressure for transparency in the supply chain in relation to the ethical sourcing of our products and services

- Increased engagement with our European customers, government and NGOs and held a number of meetings to provide an overview of the coal business, our sustainability performance and key challenges.

- In 2017, European utility companies conducted third party human rights reviews of their Colombian suppliers including Prodeco and Cerrejón (JV).

- In 2018, both Prodeco and Cerrejón (JV) participated in the Bettercoal 3rd party audits.

- Glencore is an active member of the Bettercoal Technical Advisory Committee.
Creating shared value

Local Procurement: Where possible we source locally
- $US1.5 billion spent on local suppliers

Local employment: We provide training to local people to qualify for skilled jobs
- Approximately 23,000[^1] people employed, including contractors
- 85% of our direct employees are from the local area

Synergies from infrastructure: We help ensure that infrastructure related to our assets benefits local communities and supports development
- $US7.2 million invested in infrastructure over the last two years

[^1]: As at full year 2017
Creating shared value

Social investment
- We invest in public healthcare, education and basic services such as the provision of water and sanitation
- We employ from our local communities and provide training to support the development of skills and qualifications
- $US43 million invested over the past five years

We partner with public and private agencies
- In Colombia, we’ve partnered with the Department of Social Prosperity (DPS) on social projects that reduce poverty in the region. These focus on:
  - Income Generation
  - Basic Social Services
  - Social Infrastructure
  - Reconciliation and peace building initiatives