BDO GLOBAL ENERGY TRANSITION REPORT

Global MINING / O&G Industry Report

Industry insights are based on survey responses from the BDO Energy Transition Diagnostic Tool
Energy is a concern for all companies.

Every industry across the globe will be under pressure to review and rethink their energy and carbon footprint. As government and industry pressures mount around climate change and meeting the Paris Agreement, demonstrating a robust and transparent approach to energy management and climate risk will become a norm.

The BDO Energy Transition Diagnostic framework helps raise awareness around the important pillars necessary in transitioning to low carbon.

- Mining/O&G are by necessity energy-intensive
- Pressure from stakeholders is growing globally as the focus on sustainable business practices is becoming a priority
- Solar, biofuels & wind are the alternative energy solutions that were reported as ‘mostly deployed’ from those surveyed, however small-scale hydroelectric & hydrogen were being considered the most out of all alternative energy

Moreover, integrating systems and solutions for energy efficiency monitoring and targeting is being increasingly adopted to manage energy consumption and GHG emissions.
THE TRANSITION TO A LOW CARBON FUTURE

Pressure on companies to reduce their carbon emissions is seeing alternative energy solutions becoming vital to a company’s strategy.

Energy management and sustainability are fast becoming Boardroom and business critical issues. Reporting on carbon, GHG emissions and climate-related risks are becoming increasingly mandatory. Pressures from investors, capital markets and consumers around climate related risks are requiring organisations to rethink their operations. Transparency around an organisations impact on the ecological and social environment is becoming a growing concern, especially among companies in the energy intensive sectors. Many key industry leaders have already taken a step forward in their journey to low carbon, but we have a long way to go in order to meet the Paris Agreement.

Climate-related risks are materializing today, and governments and regulatory bodies are now scrambling to play catch up, making up for years of inaction. This will likely see the transition hit some industries and organisations faster and harder than others.

The shift away from fossil fuels to alternative energy is an important step in reducing emissions quickly. As estimated by industry experts, renewables can cut energy-related CO2 emissions by about 70%. In addition, the International Renewable Energy Agency predicts that renewables and energy efficiencies have the potential to boost global GDP by 2.5% to 5% with the increased emissions mitigation.

The transition speed is currently being spurred on by massive drops in the cost of renewable energy, namely solar and wind, a surge in clean energy policies and investments, a rising number of countries targeting Net-Zero and in part by the global pandemic.

Source: International Renewable Energy Agency
Note: (1) Statistics based on survey responses gathered from three industries, Mining/O&G, Utilities and Construction. See data on last page.
81% report that the initial high capital costs is the biggest barrier to transitioning to renewables.

71% report the main driver for utilizing alternative energy is because of regulatory mandates.

35% report that customer pressure on climate change is driving their decisions to adopt clean energy.

65% ‘strongly believe’ a strong commitment to sustainability can raise investor interest.

27% confirm that they have NO specific KPIs around tracking emissions or climate related risks.

29% report that use of renewable energy results is ‘very significant cost savings’.

33% confirm that climate change or sustainability responsibility sits with C-level/Board.

67% confirm to have voluntary adopted sustainability accreditations or initiatives.

Source: BDO Energy Transition Diagnostic Tool survey
ENERGY TRANSITION DIAGNOSTIC - FRAMEWORK

AWARENESS & DEPLOYMENT
What level of awareness and deployment is your organisation in adopting renewable energy.

ENERGY EFFICIENCY
What energy efficiency solutions & activities have been adopted and/or evaluated in efforts to gain efficiencies and reduce carbon emissions.

CHALLENGES & OPPORTUNITIES
What are the main challenges and opportunities around adopting renewable energy.

STRATEGY & COMMITMENT
How does your organization rank against the industry in creating targets and commitments to reducing its carbon footprint.

MONITORING & REPORTING
How do you manage and monitor the success of the energy transition initiatives

Cleaner solutions for powering machinery and operations should be part of a company’s strategic plan for lowering carbon emissions.

The migration to alternative energies will always be, in part, a commercial decision. An understanding of the potential commercial benefits of addressing Climate Change is crucial.

Recognition of the commercial rewards and challenges of using alternative energy and other mitigating technologies will drive corporate change.

Climate change should be a strategic governance issue, one routinely on the Board agenda and included in portfolio reviews, investment decisions and risk management oversight.

“What gets measured, gets managed.” The path to sustainability requires a serious effort to understanding the current situation and starting an accurate monitoring of carbon emissions.
The Mining /O&G industry turns to solar

### Alternative energies in a company’s own operations or facilities across the Mining/O&G industry

<table>
<thead>
<tr>
<th>Energy Type</th>
<th>Deployed</th>
<th>Assessed</th>
<th>Considered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solar</strong></td>
<td>68%</td>
<td>13%</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>20%</td>
<td>10%</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Biofuels/biodiesels</strong></td>
<td>29%</td>
<td>23%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Biomass &amp; waste-to-energy</strong></td>
<td>18%</td>
<td>7%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Geothermal</strong></td>
<td>6%</td>
<td>6%</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Small-scale hydroelectric</strong></td>
<td>19%</td>
<td>6%</td>
<td>31%</td>
</tr>
<tr>
<td><strong>Hydrogen &amp; fuel cell energy</strong></td>
<td>17%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td>75%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: BDO Energy Transition Diagnostic Tool survey; Media overview

Notes: (1) Top 3 energy types are selected based on the percentage of deployment

### Top 3 Alternative energy types deployed in the Mining/O&G industry

- **Solar**: Solar prices continue to fall, easily transportable and now viewed as competitive to the traditional diesel generators often used in powering the operations.

- **Biofuels / biodiesels**: Often serves to reduce emissions; using biofuels brings benefits such as exemption from taxes, subsidies, lower price for the fuel, higher safety management.

- **Wind**: Floating wind and wave power are being experimented with to supply clean power to offshore oil and gas facilities.

Future trends: Mining/O&G may be first movers on hydrogen as prices & accessibility to the technology becomes achievable. Solar + storage / micro-grids will continue to be considered for remote mining locations and field based renewable installations for O&G.
ENERGY EFFICIENCY

Mining /O&G are actively exploring energy-saving solutions

55% strongly agree that targeting and monitoring are actively used to identify energy savings

87% of companies within the Mining/O&G industry regularly undertake site energy surveys

48% confirm that using energy efficiency technologies result in significant operational costs savings

Energy-saving solutions explored by companies across the Mining/O&G industry

Top 5

- **Energy-efficient lighting systems**: 52% Partly Exploited
- **Co-generation**: (use of wasted heat from electricity generation) 23% Mostly exploited, 13% Under evaluation
- **Smart meters**: 23% Mostly exploited, 13% Under evaluation
- **Optimised system / plant / equipment maintenance**: 77% Exploited, 16% Under evaluation
- **Heat Pumps**: 6% Fully exploited, 26% Under evaluation

The main advantages of energy-efficient lighting systems are reduced energy demand and a solid-state lighting systems, which have proven to be among the most efficient and ecological lightning technologies with ever-decreasing costs and a longer lifetime.

Effective Insulation is one of the most efficient ways to save energy.

Heat recovery system has a remarkable ability of saving a vast amount of energy and subsequently can be perceived as an alternative method to minimise expenses connected with mine air heating systems.

Future trends: Mining /O&G companies are continuing to focus on cost reductions, which can be found in energy management and boosting efficiencies via technology innovation.

Source: BDO Energy Transition Diagnostic Tool survey; Deloitte insights; Media overview

[1] Results are percentages of total number of those responding.
Opportunities for companies that switch to renewables can include:
- Reduced reliance on fossil fuels that are vulnerable to global price fluctuations, ensuing carbon taxes
- Reduction in CO2 emissions and costs which also may help to satisfy environmental and social criteria of a given project
- Improved investor engagement - demonstrating good corporate social responsibility

Challenges for companies that switch to renewables can include:
- Switching to renewables requires a complete rethink on operational processes which can be costly.
- Perceptions around the complexity, reliability, costs and performance is holding the adoption of renewables back for many companies

Those industry leaders that manage to adopt and transition to renewables will be recognized and rewarded by their investors, employees and community. Increasingly the social licence to operate will become non-negotiable as climate-related risks and externalities begin to be priced into a company’s operation.

### What key industry leaders think

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Somewhat agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>19%</td>
<td>55%</td>
</tr>
<tr>
<td>35%</td>
<td>42%</td>
</tr>
<tr>
<td>65%</td>
<td>23%</td>
</tr>
</tbody>
</table>

**Top 5 Challenges**

- **High initial capital costs**: 81%
- **Lack of government subsidies**: 45%
- **Risk of business disruption**: 45%
- **Lack of in-house knowledge / capability in available technologies**: 42%
- **Overall technological complexity**: 39%

Notes: (1) The percentages indicate the number of respondents that encounter these challenges.

Source: BDO Energy Transition Diagnostic Tool survey; UNDP; Media overview; McKinsey insights; Deloitte Vol 2. TL Series
STRATEGIES & COMMITMENT
Mining/O&G companies still not meeting UN expectations

33% report to have C-level/Board of Directors level of managerial responsibility for sustainability

60% of companies report having Department Senior Manager’s responsibility for sustainability/climate change

73% confirm to have specific KPIs and targets related to climate change/CO2 emissions

Approaches to announce corporate sustainability commitments

- 45% Performance against strategy and targets published in annual report or similar
- 35% High-level goals/strategy announced publicly
- 32% Regular communications to employees on initiatives and progress
- 29% Energy/carbon included in regular communications to wider stakeholders (local community, etc.)

Reporting
According to UN, the management of environmental and social aspects, and sustainability reporting of mining companies are currently not meeting the expectations of interested stakeholders:

- Miners are collectively responsible for 22% of global industrial greenhouse gas emissions, and pressure from customers, shareholders and regulators to lower this has been growing
- However, although not all companies are required to disclose their energy usage and carbon emissions, 67% of the companies surveyed have reported to voluntarily adopt sustainability accreditations and initiatives
- 87% have reported to gain assurance over the CO2 emissions and climate change reporting, but only 29% hire a third party and 6% mention to have Independent ISAE 3000 assurance reporting

So far, the mining/O&G industry has made little progress towards the SDGs. The sector is struggling with its reputation making it hard to attract young talent. Many of the global mining/O&G companies are trying to shift their branding - O&G to ‘Energy companies’ and Mining to one that supports the energy transition - renewables & batteries.

Source: BDO Energy Transition Diagnostic Tool survey; Bloomberg; NEF report - [2020]
Note: (1) The graph shows to what extent organisations publicly announced its corporate commitment to mitigating climate change or reducing its carbon footprint; (2) Sustainable Development Goals adopted by the UN in 2015
WHAT DOES THIS MEAN FOR YOUR BUSINESS?

The BDO Energy Transition Diagnostics Tool aims to raise awareness around the key pillars and approach to a company’s transition to low carbon. This sustainability radar illustrates where the Mining/O&G industry ranks in relation to ALL industry respondents.

Key components of the energy transition approach¹

- Energy efficiency awareness
  - The awareness and deployment of alternative energies including energy saving solutions
  - Monitoring and metering the effectiveness of the solutions
- Opportunities
  - Capturing the benefits of alternative energy & various solutions including new business models
  - Potential cost savings and operational improvements that could be gained
- Commitments
  - Commitments and ambitions relating to reducing carbon, in addition to addressing regulatory & stakeholders concerns
- Strategy
  - Managing decisions regarding the company’s sustainable development
  - The ways to carry out the commitments and requirements faced
- Monitoring and reporting
  - Key approaches to managing and monitoring and gaining assurance over GHG emissions and energy management / use

Source: BDO Energy Transition Diagnostic Tool survey
Note: (1) Refer to the Appendix section for data and components description
## SUSTAINABILITY RADAR
### Mining/O&G industry - Key dimensions descriptions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active monitoring and targeting</strong></td>
<td>Agree that monitoring and targeting is actively used to identify energy savings</td>
</tr>
<tr>
<td><strong>Regular site surveys</strong></td>
<td>Agree that site energy surveys are regularly undertaken</td>
</tr>
<tr>
<td><strong>Energy efficient operations</strong></td>
<td>The use of energy efficiency technologies and practices result in significant operational costs savings</td>
</tr>
<tr>
<td><strong>Operational cost savings</strong></td>
<td>The use of alternative energy result in significant operational costs savings</td>
</tr>
<tr>
<td><strong>HRM improvement</strong></td>
<td>Agree that robust Climate Change commitment improve staff recruitment, retention and morale</td>
</tr>
<tr>
<td><strong>Financial risks reduction</strong></td>
<td>Agree that a strong commitment to sustainability can reduce financial risk</td>
</tr>
<tr>
<td><strong>Investor interest raise</strong></td>
<td>Agree that a strong commitment to sustainability can raise investor interest</td>
</tr>
<tr>
<td><strong>Corporate commitments are public</strong></td>
<td>Confirmed that the company publicly announced is corporate commitment</td>
</tr>
<tr>
<td><strong>Energy usage and emissions are disclosed</strong></td>
<td>Confirmed that the organisation is required to disclose the energy usage and carbon emissions</td>
</tr>
<tr>
<td><strong>KPIs and targets</strong></td>
<td>Confirmed to have some specific KPIs/targets related</td>
</tr>
<tr>
<td><strong>Responsible person</strong></td>
<td>Confirmed to have a responsible person in the company</td>
</tr>
<tr>
<td><strong>Sustainable initiatives and accreditations</strong></td>
<td>Confirmed to voluntary adopted some sustainability accreditations or initiatives</td>
</tr>
<tr>
<td><strong>Ongoing monitoring</strong></td>
<td>Confirmed to have the ongoing monitoring in place</td>
</tr>
<tr>
<td><strong>Emissions reduction valuation</strong></td>
<td>Confirmed that success of energy efficiency actions measured in terms of CO2 emissions reduction</td>
</tr>
<tr>
<td><strong>Assurance over reporting</strong></td>
<td>Confirmed that assurance over the CO2 emissions/climate change reporting is gained</td>
</tr>
</tbody>
</table>

*Source: BDO Energy Transition Diagnostic Tool survey*
CONTACT

For any questions regarding this report or if you would like to speak to a BDO adviser, please contact

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DATA

N=91
Mining/OG = 30

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>Canada</th>
<th>South Africa</th>
<th>United States of America</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining (incl. Oil &amp; Gas extraction)</td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Utilities (incl. Electric Power Generation/Transmission/Distribution; Water &amp; Sewage)</td>
<td>6</td>
<td>9</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Construction</td>
<td>8</td>
<td>5</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Mining (incl. Oil &amp; Gas extraction)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: BDO Energy Transition Diagnostic Tool - Pilot Survey
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