

Montana Tech Library

Digital Commons @ Montana Tech

TECHxpo

Student Scholarship

Spring 4-13-2020

Assessing the Energy Management Culture of Global Leading Mining Companies: Curbing Carbon Emissions in a World of Growing Climate Change Concerns

Irene Ateng

Montana Technological University

C. Roos

Montana Technological University

Follow this and additional works at: <https://digitalcommons.mtech.edu/techxpo>

Recommended Citation

Ateng, Irene and Roos, C., "Assessing the Energy Management Culture of Global Leading Mining Companies: Curbing Carbon Emissions in a World of Growing Climate Change Concerns" (2020). *TECHxpo*. 23.

<https://digitalcommons.mtech.edu/techxpo/23>

This Poster is brought to you for free and open access by the Student Scholarship at Digital Commons @ Montana Tech. It has been accepted for inclusion in TECHxpo by an authorized administrator of Digital Commons @ Montana Tech. For more information, please contact sjuskiewicz@mtech.edu.

Abstract

Industries such as the oil, mining and chemical industry have been under a lot of pressure from governments and certain organizations worldwide to reduce their carbon footprint. The United Nations (UN), the International Council on Mining and Metals (ICMM) and other organizations, have mapped out policies and recommendations that can be used to achieve this. Mining companies all over the world have adopted sustainability commitments based on recommendations by the United Nations Intergovernmental Panel on Climate Change and have set targets for managing their energy use and GHG emissions. This research assessed the energy management culture of twenty (20) leading mining companies worldwide, using the UN's Sustainable Development Goals (SDGs) 7, Affordable and Clean Energy and 13, Climate Action as a performance metric, and established a trend of adaptation to these sustainability goals. Results showed that the mining industry is so far on an average, committed to achieving 80% of these goals. An investigation into the activities of these mining companies revealed what renewable technologies and energy management structures are currently being used. This research also reviewed how renewable technologies are a product of mining, which goes to prove that mining is essential in the combat of climate change. Future work will focus on assessing the impact of these management goals on the economic model of the companies.

Methodology

◆ Review of sustainability reports and financial reports from 2016 to 2018, 10-Ks and press releases from selected mining companies.

◆ The research method employed was both quantitative and qualitative;

*Types of renewable energy technologies used by these companies, alongside their carbon emission rates

*Energy management activities, policies and targets were measured and ranked against the UN's SD Goals: SDG7 and SDG13 on a scale of 0 to 3



◆ It is imperative to this research study that the selected companies are a representation of the global community, given that climate change is of global concern. Hence companies with presence in all continents in exception of Antarctica were selected for this study.

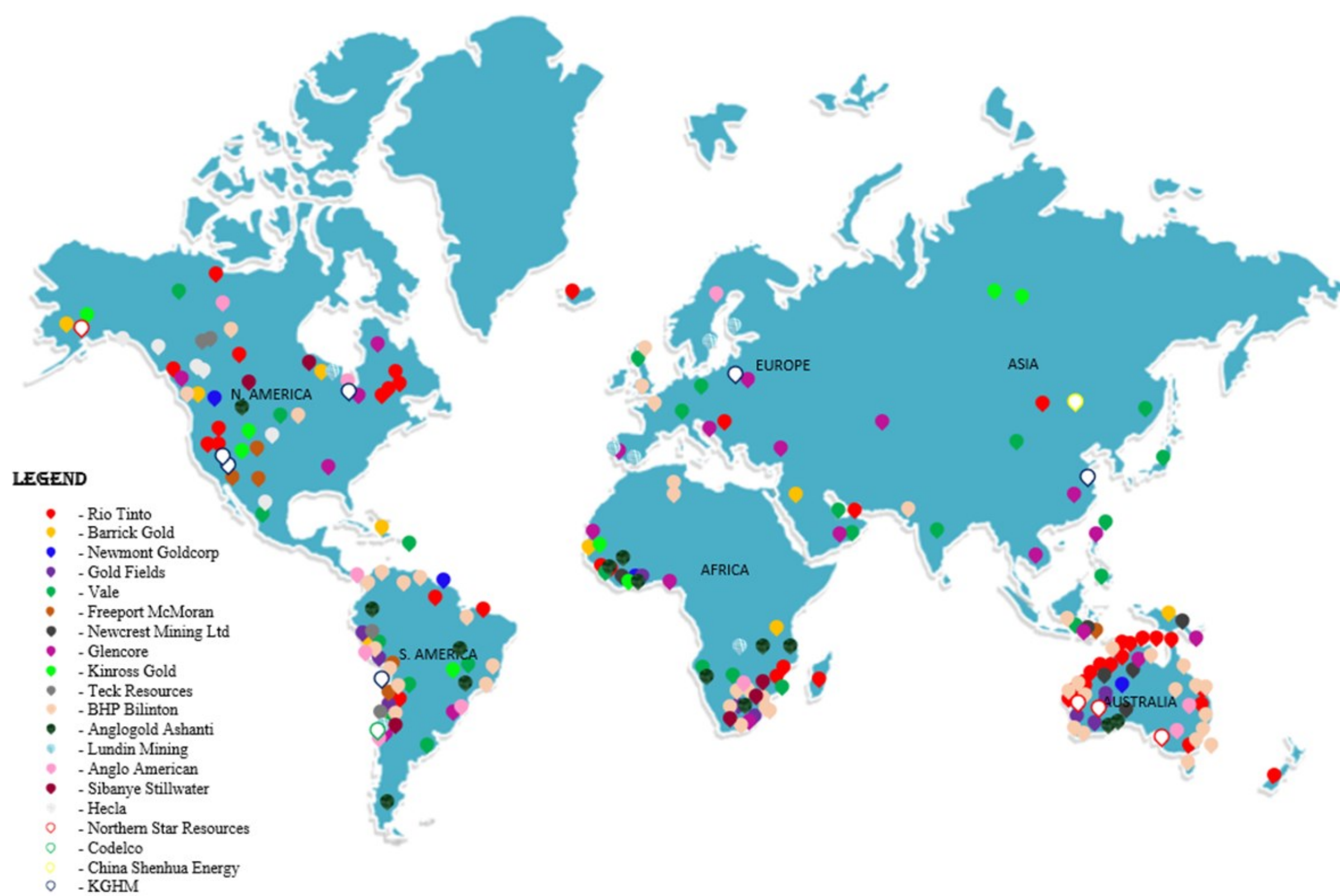


Figure 1: Global site locations of 20 selected mining companies



MontanaTech



Assessing the Energy Management Culture of Global Leading Mining Companies:

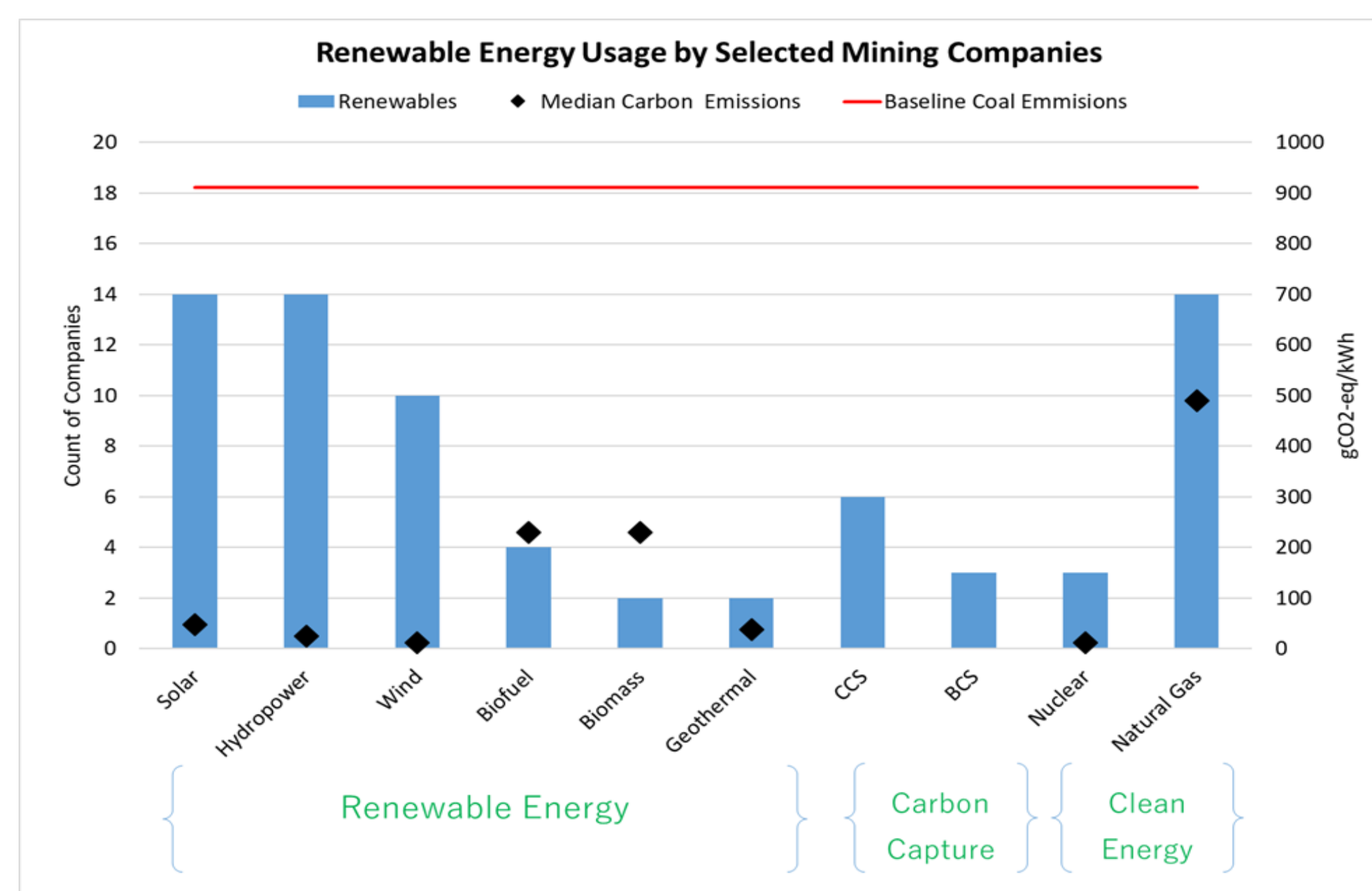
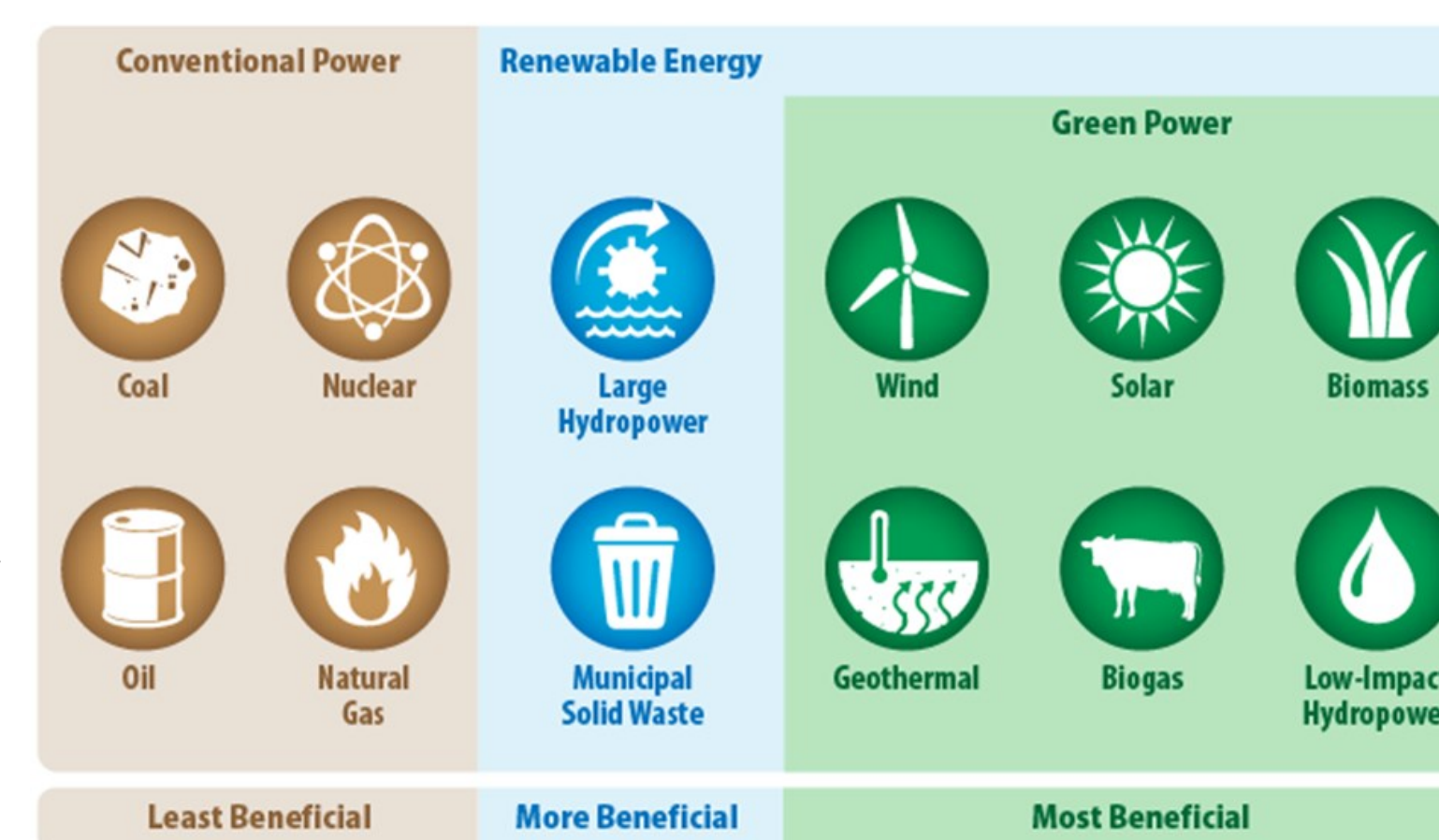
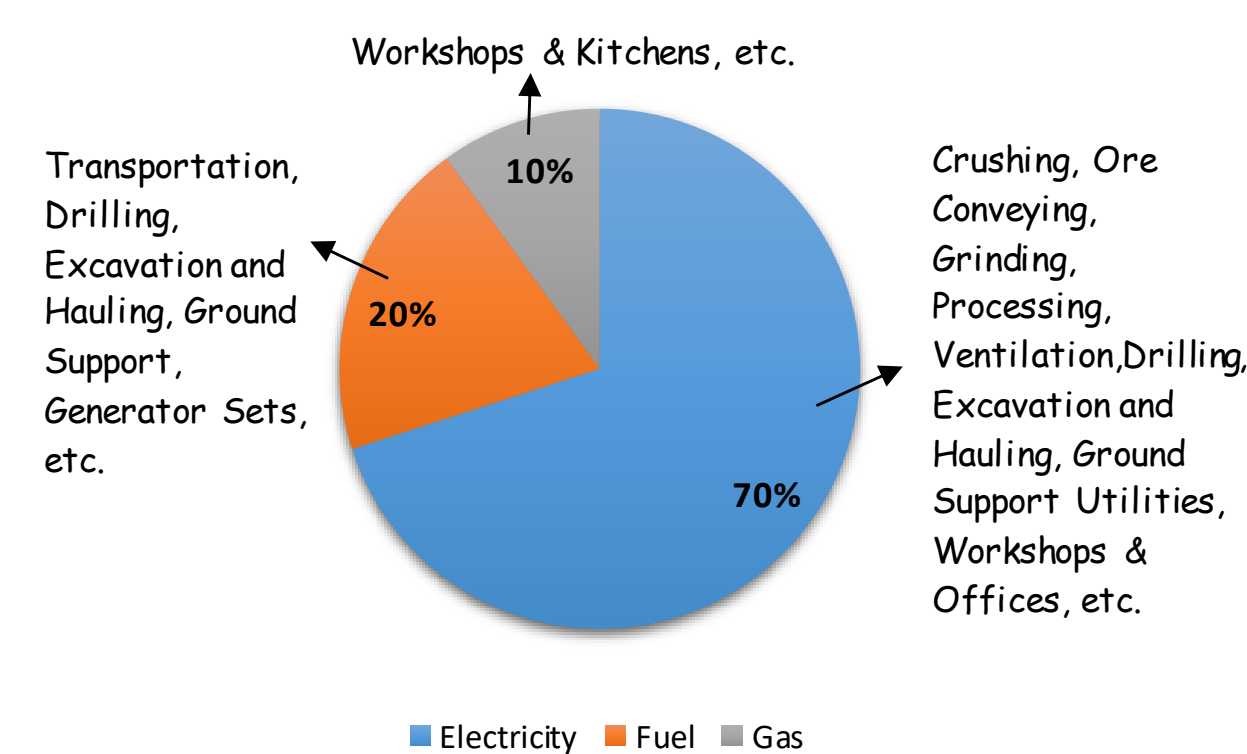
Curbing Carbon Emissions in a World of Growing Climate Change Concerns

Irene A. Ateng , Chris Roos

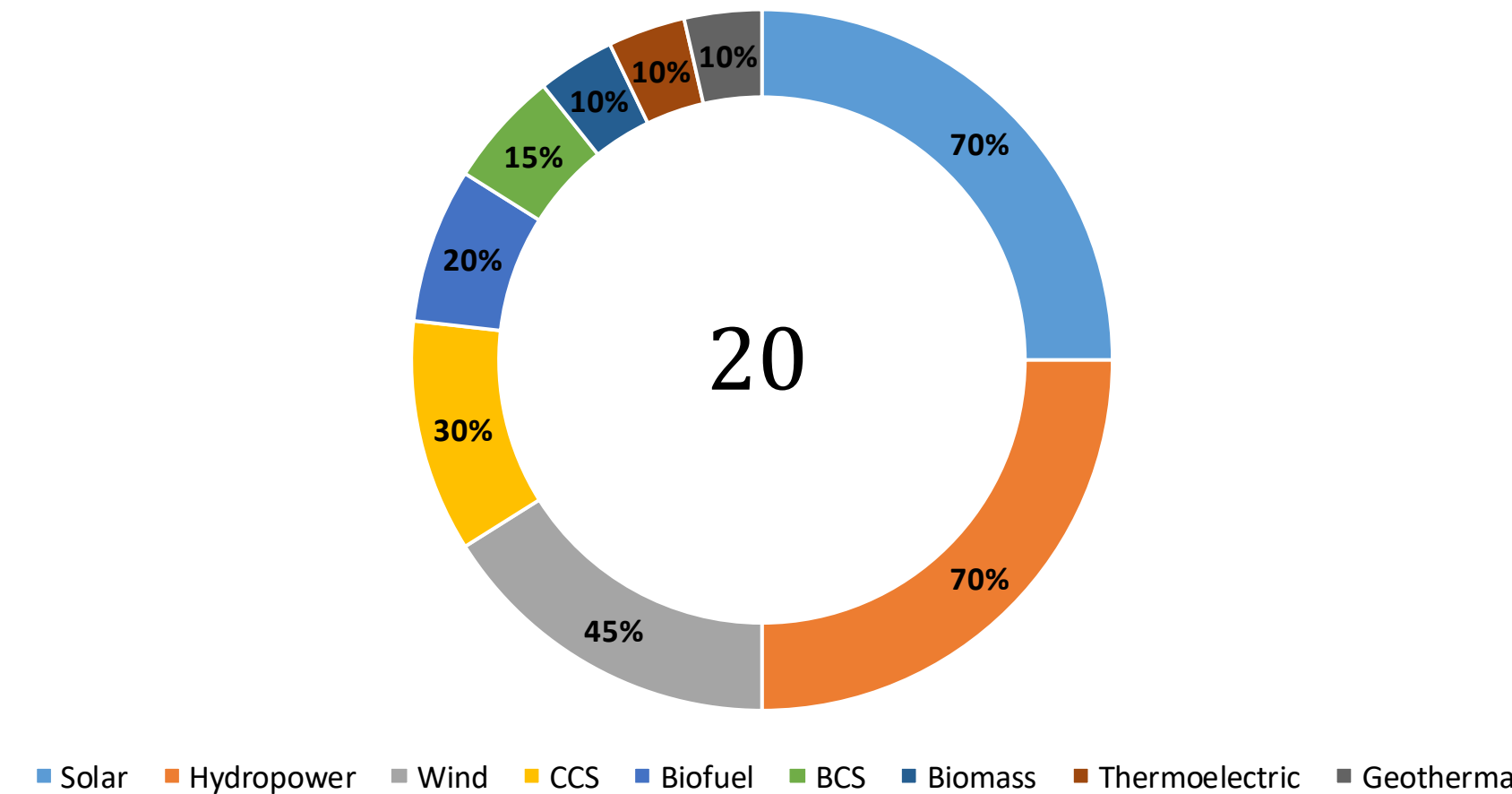
MS Mining Engineering, Montana Technological University

Data Collection & Results

Energy Use in the Mining Industry



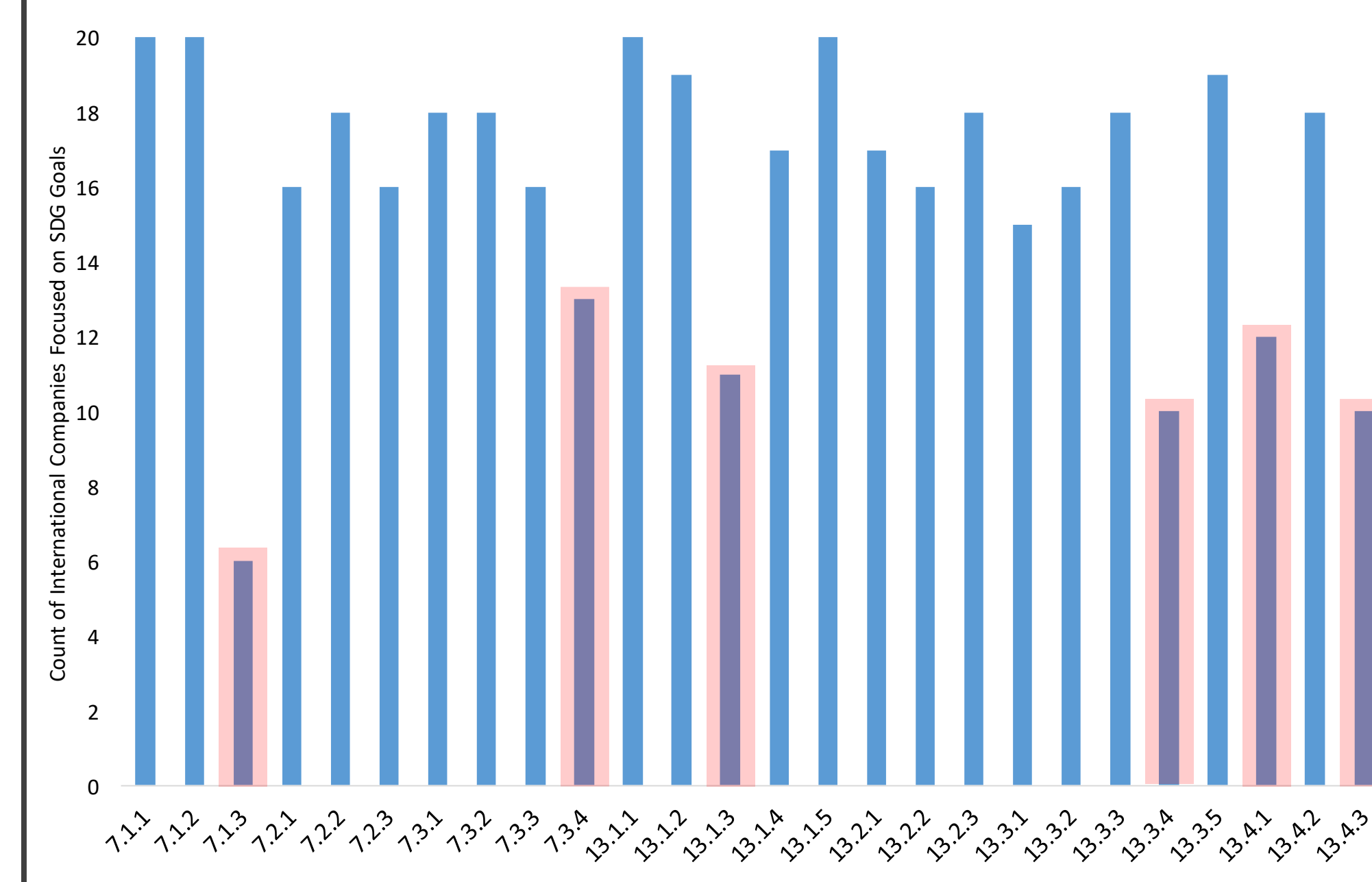
Renewable Energy Use by Selected Mining companies



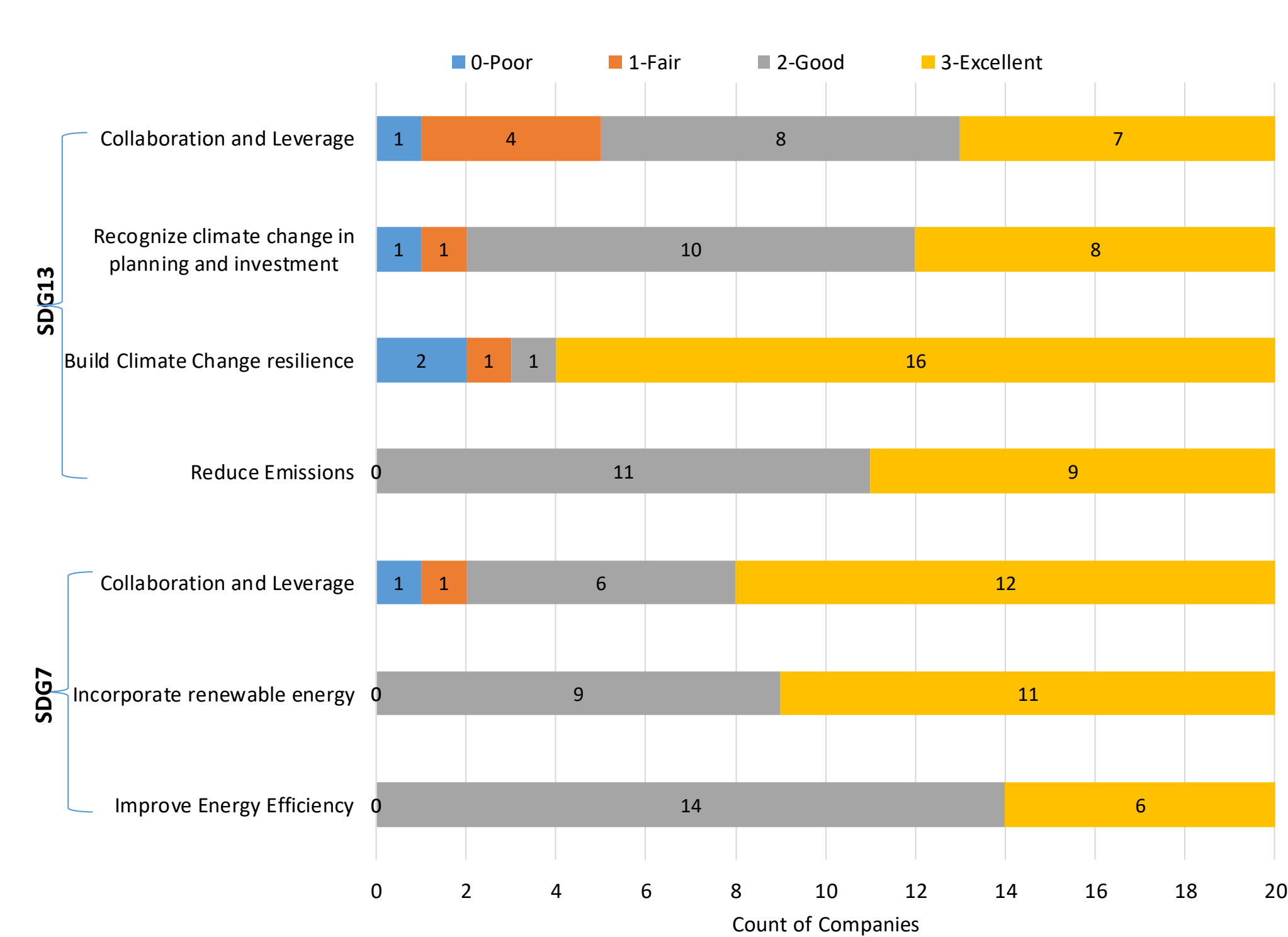
SDG7 & SDG13 Goals

| | | | |
|--|-------|---|--------|
| Understand energy audits | 7.1.1 | Improve energy efficiency | 13.1.1 |
| Improve energy infrastructure maintenance | 7.1.2 | Use renewable energy | 13.1.2 |
| Reduce energy demand onsite | 7.1.3 | Use low-emission fuels | 13.1.3 |
| Deploy off-grid wind, solar, or geothermal power | 7.2.1 | Align with INDCs | 13.1.4 |
| Diversify power sources for reducing outages | 7.2.2 | Measure and report direct, indirect, and product-related emissions | 13.1.5 |
| Reduce diesel generators | 7.2.3 | Develop energy response plans | 13.2.1 |
| Support local energy initiative | 7.3.1 | Plan for climate change impact on mines and communities | 13.2.2 |
| Integrate into rural electrification schemes | 7.3.2 | Model climate-related environmental impacts | 13.2.3 |
| Share benefits of energy infrastructure | 7.3.3 | Use scenario planning to inform views on climate and energy risks and opportunities | 13.3.1 |
| Explore co-financing arrangements | 7.3.4 | Use climate projections in design and placement of operations and infrastructure | 13.3.2 |
| | | Adopt corporate climate change, carbon management and disclosure policies | 13.3.3 |
| | | Use shadow carbon prices to inform portfolio evaluation and investment decisions | 13.3.4 |
| | | Include climate change on the board agenda | 13.3.5 |
| | | Participate in climate-related NDC and global emissions trading (CCS projects) | 13.4.1 |
| | | Engage in intra- and cross-industry climate dialogues | 13.4.2 |
| | | Publicly support carbon pricing | 13.4.3 |

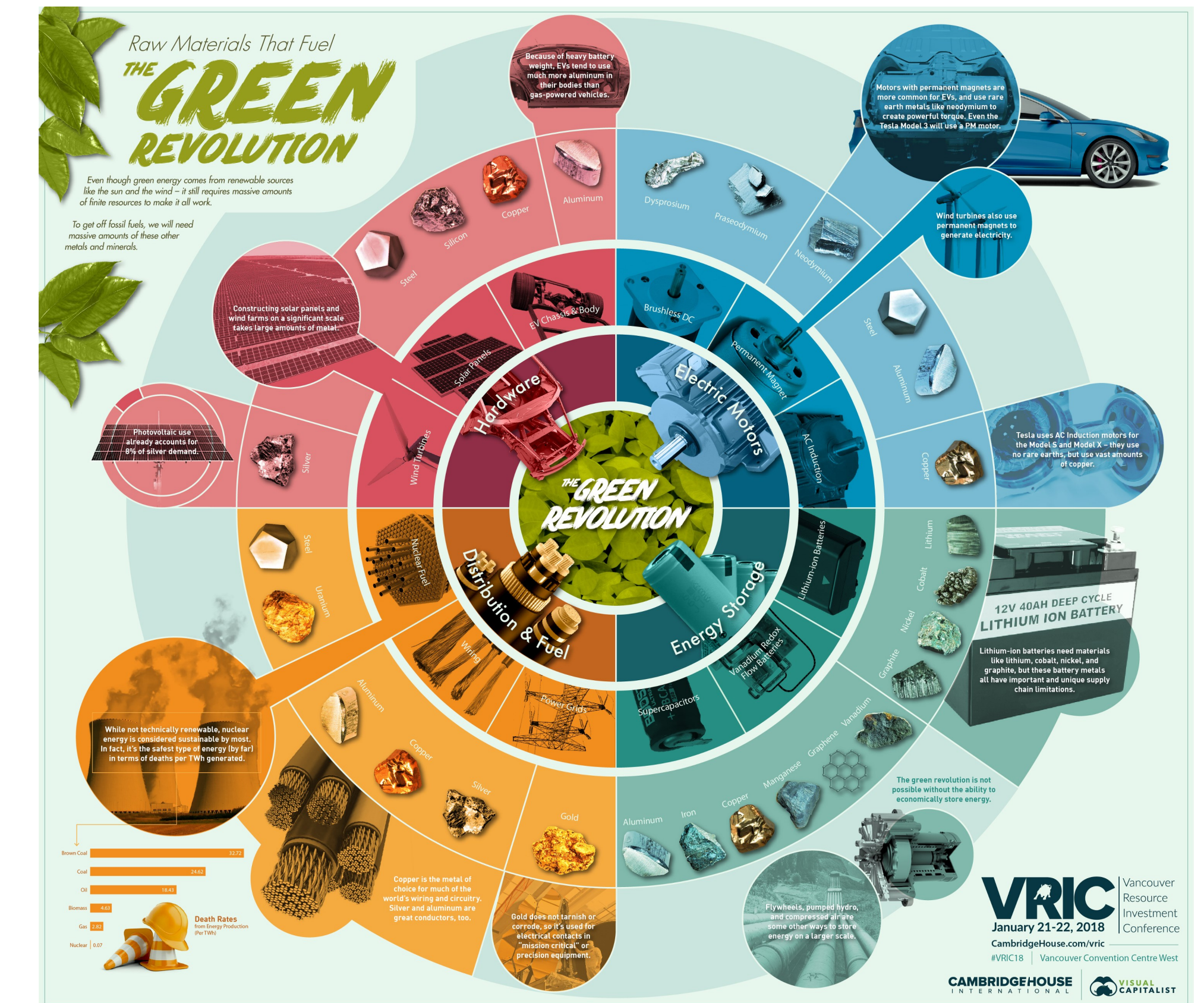
Energy Management Performance against SDG7 & SDG13 (Expansion)



Energy Management Performance against SDG7 and SDG13



Mining Fuels Renewables



◆ The renewable industry gets almost all of it's raw materials from the mining industry

Conclusions and Recommendations

◆ From data collected and analyzed, it is evident that the mining industry is fully committed to curbing their carbon footprints.

◆ Adhering to a majority of the UN's SDG7 (81%) and SDG13 (78%) goals is shows that the industry is proactive to the growing effects of climate change.

◆ The policies and performance of these leading mining companies set the standard for other mining companies to follow; the SD goals are achievable.

◆ Also relevant to this research is the importance of noting that the mining industry is the backbone of the renewables industry

◆ Acknowledging current performance, there is room for improvement to meet world-wide expectations on the mining industry to invest more in climate-related R&Ds, working towards low-emission fuels, renewables and more importantly, reducing energy demand.

◆ It is also recommended that more co-financing arrangements for green energy projects with members within the supply chain is encouraged.

References

epa. (2019, December 18). Green Power Partnership. Retrieved from epa.gov: <https://www.epa.gov/greenpower/what-green-power>

UNDP. (2016). Mapping Mining to the Sustainable Development Goals: An Atlas. Switzerland: World Economic Forum.

Desjardins, J. (2018, January 10). The Raw Materials That Fuel the Green Revolution. Retrieved from Visual Capitalist: <https://www.visualcapitalist.com/raw-materials-fuel-green-revolution/>

EITI. (2019). International Council on Mining and Metals (ICMM). Retrieved from <https://eiti.org/supporter/international-council-on-mining-metals-icmm>

UN. (2019). Sustainable Development Goals. Retrieved from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

Author

Name: Irene A. Ateng

Degree: MS. Mining Engineering

Advisor: Chris Roos, MS, PE.

Graduation Date: May 2020

Home Country: Ghana

Plans after Graduation: Work in the mining industry as a Mining Engineer.

