



Jayanta Bhattacharya
Hony. Chief Editor

Voluntary stewardship mandate of COP26 for the mining industry: no mine without renewable power

The background

The 2021 United Nations Climate Change Conference, also known as COP26, is the 26th United Nations Climate Change conference was not an ordinary event – that the mining industry should not ignore to its own peril. The event was held in Glasgow, Scotland, United Kingdom, between 31 October and 12 November 2021.

Frankly as an insider to the industry, I have observed that the mining industry globally has mostly provided lip service to concerns of climate change and sustainability. At best, they tried to do incremental changes to satisfy the constituents. Neither they have imbibed the culture of continuous specific energy and material reduction nor have they taken any stewardship role in plantation on the waste material or biodiversity protection. The example setting role is minimal and it preferred to be a laggard rather than a leader. Interestingly, for cover the industry takes refuge behind the politics and the governments – often citing how important they are for the jobs and the economy. In many cases, there is an irritating masculine bravado, foolhardy though, that has run its course long back and has long been yielding diminishing return. But, the miners stopped to see!

Neglecting research and entrepreneurship blinded the industry

It is unfortunate on how we failed in research and value chain expansion. Globally, the miners are interested only in mining and selling as soon as possible. Instant profit-making blindsided them in seeing other opportunities. No one thought about the value that minerals can make. Just take the example of crude and coal. Crude processing and distillation can produce more than 100 derivatives that have market in various industries. From coal also we could create similar opportunities by pyrolysis, distillation, and various pressure processes. From

coal we can produce chemicals that can be used in disinfection, chemicals, pharmaceuticals and fertilizers and can even produce Graphenes like materials that can have wonderful applications. But most of the coal mining companies reduced themselves to supply coal to the thermal power plants for burning. The industry continued to do what it was doing eyes wide shut. This all happened because of poor investment in mined

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materials research. To foster the emergence of such world-class mining companies, the industry will have to invest more in research and development (R&D), particularly for solutions to challenges facing markets and the people. General economic model shows that the industry will require an increase in R&D spending from the current 0.8% of Revenue to 2.4% to sustain such research and if done so, it will have at least 1% topline growth in 5 years' time-paying back the investment within 3-5 years. How it has to be done? Create profit centers within in the organization, harness the best proven talent from the market, make startups and go into alliances and partnerships to get

complementary skills and experience, measure performance and bring agility in decision making.

Actionable items as outcomes of the study

A more than a decade old INAE Study* (<https://www.inae.in/core/assets/ff3029bdd0/img/R&D-MINING%20FINAL%20REPORT.pdf>) has underscored the risk India faces due to a very weak and fragile mining industry. It pinpointed the need for augmented R&D initiatives and rapid capacity building, the efforts and resource towards that have been miniscule in R&D and the visible skill deficit in minerals sector for R&D. In the light of the above findings, and the imperative to bridge these gaps, the study team would like to recommend substantial investments to overcome the near-moribund and lackadaisical state that prevails in the arena of R&D in the minerals sector.

For overcoming skill deficit, a major effort is called for capacity building in R&D manpower by creating high-value fellowships/scholarships in selected post-graduate institutions in mining which can help attract and create a R&D talent pool. Substantial R&D investments are also needed in the areas of ICT, rock excavation engineering, and sustainable development issues affecting the mineral industry. Through this project, the INAE study team seeks to strengthen the institutional capabilities to make informed policy decisions through a suggestive roadmap comprehending the following:

1. Creation of focused efforts through national centers of excellence in specific areas;
2. Launching mission-mode projects of relevance for the minerals sector's future and sustenance of mineral supply and
3. Enhancing the capability and capacity of the existing national laboratories. The components of the roadmap may be elaborated in the following:

... the industry will require an increase in R&D spending from the current 0.8% of revenue to 2.4% to sustain such research and if done so, it will have at least 2% topline growth in 5 years' time-paying back the investment within 3-5 years. How it has to be done. Create profit centers within in the organization, harness the best proven talent from the market, make startups and go into alliances and partnerships to get complementary skills and experience, measure performance and bring agility in decision making. May be the CEO's hand-off approach will work better.

Mine plus renewable power: the new paradigm

The mines need a lot of land where solar and wind power can be easily installed on the excess and reclaimed/recovered land. The advantages are for the mines having power grids close by. But without that too, secondary lighting like office lighting, street lighting and water pumps, etc. can be easily done by the mines in the remote areas for the community. Where grids are available, even if the integration of photovoltaic installations into an energy supply system does not directly lead to a cost reduction today, it is guaranteed in any case that fossil fuel reserves will be saved and the energy supply sustainably ensured. Ultimately, costs and environmental impact are always significantly reduced.

If the solar system is supplied under a "power purchase agreement" regime, the OPEX cash flow of the mine would not even be affected, and the energy supply would become cheaper from day one as investors in solar projects know the benefit of the long term use and already have trust in the technology.

In the lifetime of a mining operation, the PV system must be shifted or placed elsewhere on the site. This presents not a serious problem because the installation is highly customizable and mobile due to the modular design. On a lot of mining locations, the surface has been used for different purposes and parts of the soil have been left for future recycling. Solar greenfield sites can be used especially on former industrial areas, so named brown fields. The advantage is that these areas

are still accessible, have a better optical look and the environmental impact of mines will have a strong positive argument.

The mines can be innovative in their choices: whether to investing in the solar projects on their own balance sheet or if they are signing a power purchase agreement. Nonetheless, the carbon dioxide reduction will be a big benefit, especially when compared each kWh produced with a diesel generator or buying expensive electricity, against solar power projects. Each kWh produced with fossil fuels or coal will generate an average of 0,65 kg of carbon dioxide. A typical solar power greenfield for mines would start at a minimum 2 MWp installation. This leads to 3 GWh of energy production per year. This 3 GWh replacement would decrease the carbon dioxide emission of the mine for 1,95 Mio metric tons of carbon dioxide a year!

Taking into consideration that the lifetime of a properly installed solar system is more than 40 years and that the expected pay-back-times are less than 10 years, every solar or wind system would generate the energy only for the maintenance costs.

Mining operators and investors already understand very well that energy costs have a decisive influence on the profitability of a mining project. Taking into account that, besides saving on operational costs, initial investment is becoming even smaller, it is difficult to understand that the use of PV in regions of high solar irradiance is not yet being considered by default. One of the reasons may be that mining is characterized by conservative investment strategies. But this is just a possible explanation and not an acceptable excuse anymore.

Few words

Mandatory adoption of solar power needs regulatory changes and support, as in India, in the Mineral Conservation and Development Rules, 2017 and Mines Act.1952 necessitating commitment for renewable power in any form of mining, even including small mines. The state also has a role to play.

*The INAE study was done under the leadership of Late Professor Ajoy K Ghose and was jointly written by Prof. Ghose, Prof. R.N. Gupta and the author.



India's renewables to see largest upswing in 2021: IEA <https://energy.economictimes.indiatimes.com/news/renewable/indias-renewables-to-see-largest-upswing-in-2021-iea/79151487>