



INSIDE THIS ISSUE:

<i>India News</i>	2
<i>World News</i>	3
<i>Statistics</i>	4
<i>Regulations & Cases</i>	4
<i>Publications</i>	4
<i>Miscellaneous</i>	4

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IMPACT OF COAL MINING (PART 1)

The process of extraction of valuable mineral resources lying under the surface of the earth by employing different methods is called mining. Mining has always been an environmentally disruptive activity, but contemporary extractive industries are located in some of the most ecologically sensitive forests. As a result, mining leads to more long term impacts in the form of pollution, infrastructure development and increased human activity. The extracted mineral undergoes various physical and chemical process to get purified, and are used as inputs in industries to make different end products. Pollution to the environment is contributed not only by the industries but also due to the process of extraction of minerals.

In India, coal is the preferred source of power for thermal power plants and accounts for 55% of its energy need. As a result, coal mining has the highest production value in India, accounting for 42.3% of the production value at Rs. 9519 crores ([February 2017](#), Indian Bureau of Mines) after petroleum (crude), iron ore, natural gas (ut.) etc.

There are [two different types of mining](#) techniques employed to extract coal: (i) open cast or surface mining (ii) underground or deep mining. Depending on the availability of coal and depth of availability, the technique involved for mining is decided.

[Open cast mining](#) is suitable when the coal is available nearer to the surface of the earth. To expose the coal seam, the surface layer is fractured using dynamites, later the coal seam is drilled and fractured to extract the raw coal. This method has the possibility of recovering 90% or more of the coal.

In [underground mining](#), two main methods used: 'Room and Pillar mining' which leaves coal pillars to support the roof of the mine, this pillar may contain up to 40% of the total coal which can be recovered later. 'Long wall mining' is the extraction of the coal from one section of the seam using mechanical shearers. The roof is supported using the hydraulically powered supports. Over 75% of the coal can be extracted from panels of coal that can extent 3kms through the coal seam.

Open Cast mining causes severe damage to the environment, as this requires clearing of the surface vegetation before starting the mining activity. This causes environmental degradation and also results in displacement of wildlife and human settlements in the area. When the mining is done in near rivers, it may obstruct its water flow. The resultant activity of removal of soil etc will create water pollution along the stretches of the river.

The unearthed rock and coal mixture with water will form [acid mine drainage](#). This is a situation where the minerals from the rocks and heavy metals from the coal combine to form an acidic mixture, which leaks out of abandoned mine. When it seeps and reach the groundwater table, the surrounding region gets polluted, destroying the vegetation surrounding the mining site. Without a costly reclamation, the damage done by acid mine drainage cannot be reversed.

Coal reserves also contain pockets of methane. A mining worker exposed to it over a long period of time will have severe health impacts. Inhalation of coal dust and carbon will [harden their lungs](#), leading to black lung disease a.k.a pneumoconiosis or CWP. [Studies](#) have indicated that people living near coal mines also have higher-than-normal rates of cardiopulmonary disease, chronic obstructive pulmonary disease, hypertension, lung disease, and kidney disease.

Even with all these drawbacks, coal continues to be the leading source for production of electricity in most of the countries, stating the reasons, such as ease of handling the fuel, setting up of the power plant, easy availability, etc. Creating a better plan and adopting proper mitigation measures will help avoid some problems but the damage done due to coal mining cannot be mitigated fully. **(continued)**

NITI AAYOG FAVOURS LAW HIKING MINIMUM FINE ON POLLUTERS

The Central Pollution Control Board (CPCB) has recently ordered closure of many polluting units in Uttar Pradesh and elsewhere, but such a 'drastic' step could soon be the last resort if the government finally legislates a proposed law which imposes heavy fines on violators instead of shutting them down altogether.

The proposed law provides for an increase in the existing penalty from Rs 1 lakh to a minimum Rs 5 crore and imprisonment up to seven years for causing 'substantial' environmental damage. It also has provisions of imposing fine up to Rs 20 crore and extending the imprisonment to life term in certain cases where the polluting industries cause damage to larger areas.

Though the proposed legislation has received the law ministry's nod last year, the environment ministry has, so far, not put it before the Union Cabinet for clearance. Officials in the ministry indicated that the draft still needs

to be fine-tuned after incorporating certain suggestions from stakeholders. Though the proposal drew a lot of flak from environmentalists who criticized the 'pollute and pay' principle, the case to have such a law is strengthened by the government's policy think tank Niti Aayog.

The Aayog in its three-year action agenda, released on last Thursday, pitched for change in legislation, arguing that the present mechanism under the existing law (Environment Protection Act, 1986) may often lead to either "drastic action or no action" against violators.

It said, "Closure and cutting electricity/water should be the last resort. Presently, the choice for a pollution control board faced with non-compliance is to take drastic action or no action. The result is that frequently no action is taken until matters reach a crisis point". The ministry while bringing the draft of the proposed legislation too had taken the similar plea, arguing that the basic objective

to introduce civil penalties is to ensure that those who are non-compliant and are polluting should pay for environmental restoration without always facing the threat of closure, which often also means job losses for thousands.

At present, a violator has to pay a maximum fine of Rs 1 lakh and faces imprisonment up to five years on conviction. The fine can, however, be imposed only after filing a complaint in a court and getting an order for the same against the violator.

The proposed legislation is meant to amend the existing Environment Protection Act and the National Green Tribunal (NGT) Act. Once amended, the law will have separate provisions of categorisation of green violations into 'minor', 'non-substantial' and 'substantial'.

[The Times of India](#), August 29 2017

The Carmichael coal mine is a proposed thermal coal mine in the north of the Galilee Basin in Central Queensland, Australia. Mining is planned to be conducted by both open-cut and underground methods.[1] The mine is proposed by Adani Mining, a wholly owned subsidiary of India's Adani Group.

INDIA'S DEPENDENCE ON COAL TO CONTINUE DESPITE RENEWABLES

Even as India has made a considerable push towards renewable sources of energy keeping in view its Paris Agreement goal, the country's dependence on coal as primary source of energy will continue as its 'social cost' is quite less as compared to that of solar and wind.

The government has brought in the 'social cost' element in its latest Economic Survey which noted the importance of renewables but suggested a cautious approach, saying investments in renewable energy be made at a "calibrated pace" looking into the total cost accrued to the society. The 'social cost' is calculated while factoring in private costs of electricity generation, opportunity cost of land, health costs as well as the costs of stranded assets of the

conventional energy generation plants if it become idle due to shift to renewables. The survey calculated the 'social cost' of renewables at Rs 11 per kWh which, it claimed, is three times that of the coal in 2017 and the gap would reduce only when the country progresses towards the year 2030.

The government's chief economic advisor Arvind Subramanian, too spoke about this scenario when he noted that the coal continues to be "a very cheap way of providing energy to hundreds of millions who are still energy-deprived". He said though renewables were part of the energy answer, it came with "hidden cost" which must not be overlooked in the country's headlong embrace of renewables.

Subramanian suggested to factor in the 'social costs' of both

renewables and coal before taking any decision and said, "Current bids on renewables are not especially revealing or informative about the true costs because of extensive subsidies (implicit and overt, awarded by centre and states) and strategic behaviour by producers".

Though the survey constantly referred to India's commitment to fulfil its pledges made under the Paris Agreement on climate change, it stated that the first goal for India is to provide energy access to its entire population and bridge the "development deficit gap" by tapping all cleaner sources – an indication that the country may also move fast towards using nuclear energy for electricity generation.

[The Times of India](#), August 22 2017

WHY THE CARMICHAEL COALMINE MATTERS TO AUSTRALIA—AND THE WORLD

Adani's proposed Carmichael coalmine in Queensland would be the largest Australia has ever seen and the federal and state governments are keen to offer it financial support. Adani has said that over a 60-year lifetime, the company expects to extract 2.3bn tonnes of coal, which would make it equivalent to the biggest mine in the US. It is proposed to have six open-cut pits as well as five underground mines, with a disturbance area more than 30km long.

The company initially obtained approval to remove 60m tonnes of coal each year, but has scaled back its ambition to an initial production rate of 25m tonnes a year. But building the mine would have a much wider indirect effect. Carmichael would be the first mine in the giant untapped Galilee coal basin. The infrastructure that would be built to allow extraction of coal from the Carmichael mine could serve at least 10 more. If all the mines mooted for the basin were built and reached their proposed maximum output at the same time, they would be producing 330m tonnes of coal a year – more than Australia's entire coal industry does now.

The Queensland state government has made a deal with Adani, offering it a break on its royalty payments for the coal it extracts – but the details are secret. A wide range of groups are opposed to the project for different reasons.

If the mine does extract all the coal Adani says it plans to, the average emissions from burning that coal will amount to about 77m tonnes of CO₂ each year.

And if the mine reaches its touted peak production rate of 60m tonnes a year, it will be responsible for more than 120m tonnes of CO₂ emissions in those years – more than the annual emissions of many countries.

If the mine goes ahead and that leads to the development of other mines in the basin, their potential combined maximum output would

result in more than 705m tonnes of CO₂ being emitted each year. That's about 1.3 times Australia's total current emissions. If even half that were produced it would result in emissions larger than those of most nations.

If the world wants to have a 50% chance of keeping global warming at less than 2C above pre-industrial levels, 88% of the world's known coal reserves need to stay in the ground. In the Asia-Pacific region, more than 90% of coal needs to stay in the ground, according to research published in Nature.

Coal burned in other countries is not counted in Australia's emissions – coal from Carmichael would be exported to India – but many scientists and commentators have pointed out that producing those emissions runs counter to Australia's commitment in the Paris climate agreement to work to keep global warming at “well below” 2C.

Among the most pressing environmental concerns with the Carmichael mine, aside from climate change, is its reliance on water, a precious resource in Australia. About 250 litres of freshwater is used for each tonne of coal produced. In April the Queensland government granted Adani a highly unusual water licence to extract unlimited amounts from a water body that feeds into the underground Great Artesian Basin. Adani itself has estimated it will use 12bn litres of water a year – or 13 Olympic swimming pools a day.

The licence acknowledges this will “have an impact on the underground water levels in the region of the mine” both during and after the mine's planned years of operation. As that water level drops, farmers' bores could run dry and unique ecological communities in the region that rely on the natural springs may be destroyed. Environmentalists and farmers have complained that there are

no “trigger thresholds” that will force mining to stop if Carmichael uses too much water. Environmental groups have worked hard to link the development of the Carmichael mine to the destruction of the reef.

Over the past two years, half the coral on the reef has been killed in bleaching events caused by rising water temperatures, mostly a result of climate change.

Scientists have said that for coral reefs to have any chance of a future, global warming must be stopped at 1.5C. Even if that could be achieved, coral reefs would be severely degraded.

So to the extent that coal from the mine contributes to global warming, it is a threat to the reef. But the mine will also have a more direct impact, since the coal will be exported to India via a shipping terminal on the Queensland coast at Abbot Point, opposite the reef, increasing the risks of collisions, spills and excessive coal dust harming corals.

Access to the grid is too expensive for most of those people, making off-grid renewable generation a much more realistic option for alleviating energy poverty. The Indian government is aware of this, with plans to stop importing coal altogether. And its energy policies have been driving the cost of solar to record lows. It is true that about 75m rural households and 6m urban households in India have no power.

But burning more coal won't help the vast majority of those people, since they don't have a connection to the electricity grid.

[The Guardian](#), 15 August 2017

Carbon capture and storage (CCS) is a range of technologies that hold the promise of trapping up to 90% of the carbon dioxide emissions from power stations and industrial sites. It involves collecting, transporting and then burying the CO₂ so that it does not escape into the atmosphere and contribute to climate change.

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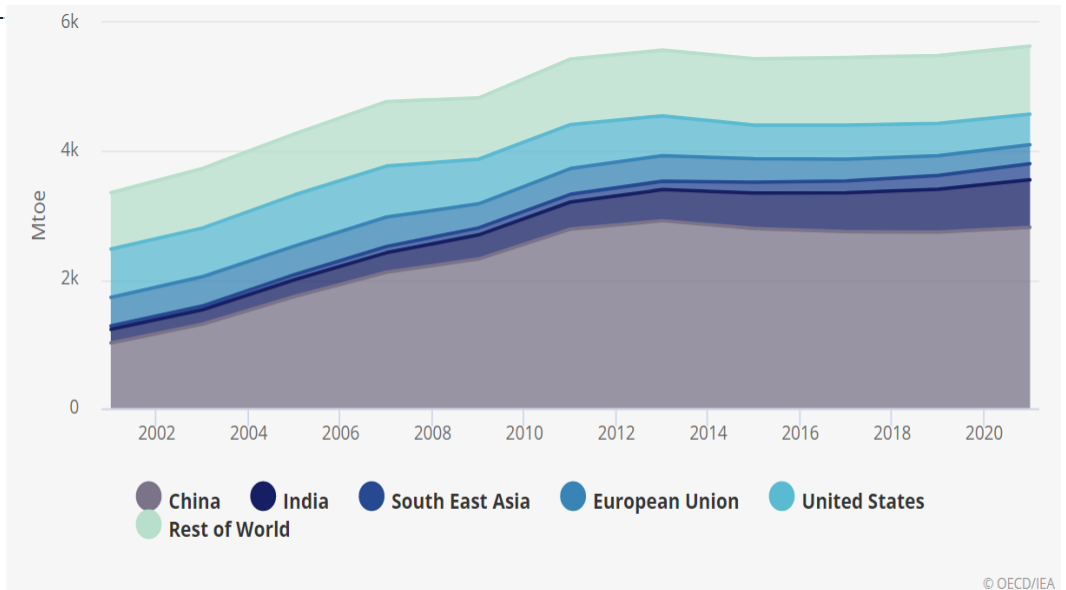
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Citizen consumer and civic Action Group (CAG) is a non-profit, non-political and professional organization that works towards protecting citizens' rights in consumer and environmental issues and promoting good governance processes including transparency, accountability and participatory decision making.

COAL DEMAND 2001-2021, BY INTERNATIONAL ENERGY AGENCY



Source: *Medium-Term Coal Market Report 2016*

REGULATIONS AND CASES

- Proctor and Gamble (P & G) Home Products Limited Vs PC Sharma “ Handling hazardous products without obtaining EC”, Original Application No. 30/2015, August 3 rd, 2017, [Click here](#)
- Joy Kaitharnath & Ors Vs CPCB & Ors, “Discharge of effluents into the water bodies ”, Application Nos.142, 290 and 453 of 2013, August 31st 2017, [Click here](#)

PUBLICATIONS

- Environmental Justice Australia, “Toxic and terminal- How the regulation of coal-fired power stations fails Australian communities”, 7th August 2017, [Accessed on 11th September 2017] [Click here](#)
- International Energy Agency (IEA), “World Energy Balances– Overview”, 2017, [Accessed on 11th September 2017] [Click here](#)

MISCELLANEOUS

- Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Solar PV Power Projects, August 2017. [Click here](#)
- Nepal's Citizens Climate Budget: Where is Nepal's money being allocated ? by UNDP- This booklet offers an overview of the budget allocated to address climate change and its effects in the country since 2013/14. [Click here](#)