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The Next Revolution

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(This editorial is based on the article '[The Next Revolution](#)' which appeared in 'The Indian Express' on 1st April, 2019. The article talks about the energy matrix of India and changes it will undergo in the coming future.)

Many multilateral institutions like the International Energy Agency (IEA), the erstwhile Planning Commission, or now the NITI Ayog, have projected that energy demand in India will move on an upward curve; indigenous supplies will fail to keep pace with this increase in demand; energy imports will rise in absolute and relative terms, and, the environment will face increasing stress.

More specifically, coal will dominate, oil and gas will have significance; renewables, whilst on a rising trend, will account for a relatively inconsequential share and air pollution, depleting water tables and extreme weather conditions will lead ecological collapse.

Current trajectory of energy consumption is fundamentally against the objective of sustainable development and hence warrants a timely intervention.

Current Trends

A recently published energy outlook asserts that in 2040, fossil fuels will account for between 70-75% of India's primary energy consumption — down from approximately 90% today. Coal will account for 45% (down from the current 55%); oil 20% (down from 30% today) and natural gas at the same levels as today of around 7%. Renewables market share will increase to 15% up from the current 3-4%.

Consequently, India will have to import 95% of its oil requirements; 60% of its gas requirements and 30% of its coal requirements despite the fact that it contains the fifth largest deposits of coal in the world.

India will meet its Paris commitments to reduce Green House Gases emissions by 35% in 2035 relative to 2005. But, given this level of fossil fuel consumption, it will be one of the largest absolute emitters of pollutants in the world.

India has the world's second largest population of about 1.3 billion and significant amount of people live in darkness without access to electricity. While the Indian electricity system suffers from resource and economic constraints on one hand, environmental concerns too pose a challenge.

While many countries have switched over to renewable energy solutions for electricity, India still lags behind with just 20% of its electricity generating capacity, or 67033 MW, being based on renewable sources like wind, solar and biomass.

The need to shift soon

India is largely dependent on coal to meet its energy needs because of abundant availability of coal. It is not only one of the cheapest fuels and but there are no competitive substitutes for liquids as a fuel for mobility. **Coal meets more than 50% of the current commercial energy needs and generates more than 70% electricity. But the energy from coal comes at a huge environmental and health cost.**

It is estimated that of the entire industrial sector, 60% of particulate matter (PM) emissions, 45-50 per cent of SO₂ emissions, 30% of NO_x emissions and more than 80% of mercury emissions comes from coal-based power plants.

Coal-based power plants also account for about 70% of the total freshwater withdrawal by the industrial sector and close to half of our total greenhouse gas emissions. On top of this, most of the coal mining areas have been declared as critically polluted areas as well.

There exists fatal overlap of coal reserves, dense forests, tribal populations, high poverty and backwardness. Mining coal, therefore, leads to a huge conflict between the local communities on one hand and destruction of dense forests and wildlife which may be extremely difficult or impossible to regenerate.

India's dependence on imported fossil fuel is also increasing at an alarming rate. We now import close to 40% of commercial energy and this is only going to go up in the near future. Given the volatility prevalent in the international energy markets, this has huge implications for energy security of the country.

Roadblocks in transitioning

The costs of transitioning to renewable source of energy are huge.

They can be calculated in terms of the costs of stranded thermal power assets or the creation of transmission and distribution infrastructure to overcome the problem of "intermittency"(as the sun does not shine all the time; nor does the wind blow with regularity making these sources highly afflicted with fluctuations).

The energy sector also suffers from technological (that is, storage or carbon sequestration) and regulatory (conservation norms, emissions standards) issues to overcome before clean energy can be brought to scale.

Road to cleaner and sustainable future

Institutional, technological, financial collaborative steps should be taken to bring the revolutionary change in the ratio between fossils and renewables in the energy basket of emergent India.

There is a need to facilitate a holistic overview of the linkages between the different components of energy (oil, gas, coal, renewables, nuclear, hydro, bio, non-commercial); between fuel usage, electricity, mobility, industry, and agriculture, on the one hand, and, ecology on the other.

We have to create the appropriate institutional structures of decision-making. The current structure of multiple "energy" ministries (petroleum, coal, renewables, and power, atomic) should be collapsed into one omnibus Ministry of Energy and Environment. This will enable integrated decision making; it will also provide a platform for collaborative public-private and constructively "disruptive" innovation. Besides, it will also bring sustainability to the fore of policy.

An "**Energy and Environment Security**" Act can also be legislated which should engage the public in the larger debate on how to weaken if not break the current unhealthy nexus between economic growth, energy demand and environmental degradation.

Way forward

Energy economics needs to be redefined as India's economic future depends on its ability to aggressively expand renewable investment and cut back on energy imports, whilst focusing on energy diversification and the reduction of the current massive account deficit.