- The number of males engaged in part time study over the three periods fluctuated, dropping from approximately 1 million to 900,000 over the three periods; (Meanwhile, the females studying part time steadily increased from nearly 800,000 in 1970-71 to well above million in 1990-91.)

1. Paraphrase
2. summary
3. paragraph 1
4. paragraph 2.

- The bar chart shows the proportion of men and women who taught in seven different faculties of a particular university in 2012.

1. Overall,
2. while
3. Furthermore,
4. Moreover,
5. Meanwhile,

Power for All and Energy Security

Manoj Kumar Upadhyay

Energy is a key indicator of the living standards of citizens of any country and instrumental in raising it. The correlation between per capita consumption of electricity (a proxy for all energy forms) and Human Development Index (HDI), makes it the fundamental input to any economic activity. Despite accounting for 18 per cent of the world's population, India uses only around 6 per cent of the world's primary energy. The four primary sources of energy are coal, oil, gas and renewable energy. Out of the four, India is well endowed in coal as well as renewable energy sources including bio-energy.

Coal

From an availability perspective, coal reserves in India have been estimated to be roughly about 300 billion tonnes. It has been the mainstay of the Indian electricity system so far and is likely to remain so in the immediate future as well. Due to the vast availability of this fuel source, it could remain the cheapest source of energy for India for a long time, if explored and used efficiently. It is the only energy source for which India is not dependent on imports (except coking coal used for steel making). The import of thermal coal can also be reduced to zero if a proper policy framework for exploration-cum-mining for commercial use is put in place. Coal is however not an environment friendly fuel compared to renewable energy and is likely to lose out in the long run. Though when compared to renewable energy, particularly solar energy, thermal power plants take up only about 1/50th of the land required for generation of the same amount of power at current level of efficiencies.

Oil and Gas

As far as oil and gas is concerned, these resources in India are not adequate to meet its growing requirement. Of the two, the price of oil has been much more volatile, where the slightest increase puts tremendous pressure on the economy. Compared to oil, gas is cheaper and more environment friendly. Though oil comprises 29 per cent of total primary commercial energy mix and gas only 7 per cent, it is imperative that India's dependence on oil and gas as a source of energy is reduced to the extent possible by encouraging a switch to other forms of energy, such as electricity which can be derived from renewable sources. Even then, India would have to remain dependent on import for oil, as it cannot meet its

The bar chart illustrates the number of [illegible] females engaged in further education in Britain. It shows whether they were studying full-time or part time and is divided into three periods.

Overall, the number of men and women studying part-time outnumbered those studying full-time by a significant margin. While both modes were relatively similar between the sexes, there was some variance, especially in the 1990s when the number of women studying part-time increased substantially.

With regards to full-time education, male students approximately doubled from around 1,00,00 in 1970 to well over 200,000 by the end of 1991. For women, the trajectory was less consistent rising sharply in the first decade and then tapering off to an almost identical level to that of men in 1990s.

the international prices due to large import dependency which is likely to continue for a long time.

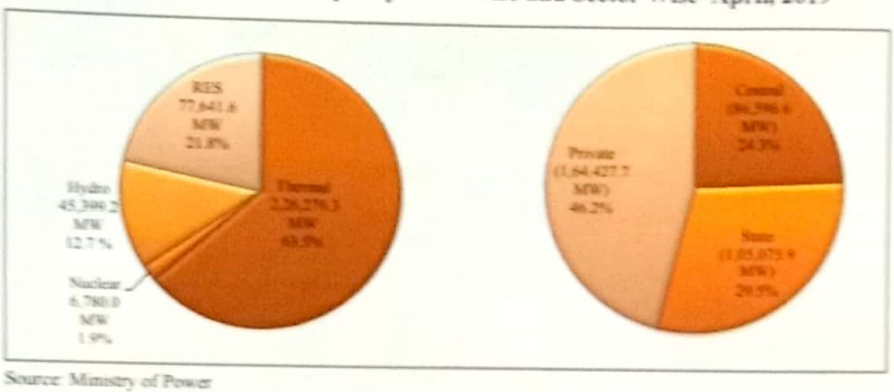
Renewable Energy

The third source is renewable energy from solar, wind, biomass, hydro and more such sources. It is also the most environment friendly. Fortunately, being located in the tropics endows us with virtually unlimited potential of solar and wind energy. The huge availability of biomass sources in the form of crop residue, cattle dung, human waste and food waste, also present large scale opportunities for biomass based energy production. The prices of renewable sources, particularly solar and wind, have been reducing drastically and are now almost at par with electricity generated using coal. However, the issue with renewable energy is its volatility, uncertainty and seasonality. Further, solar energy, though at par with thermal electricity in terms of cost, requires more than 50 times the land to generate the same quantum of electricity as from thermal power plants. This can become a limiting factor, even though rooftops and farm land offer a solution. Yet, while the issue of volatility and uncertainty is being addressed by a number of economical storage solutions, the problem of seasonality may still limit the full exploitation of this source. For this, the conversion of solar energy into hydrogen and methanol would have to be seriously researched and made viable.

Bio-Energy

Bio-energy can play a major role in strengthening the energy basket of India. Biogas derived from cattle dung, human waste and vegetative waste, can, to a very large extent, provide cooking solutions which are cheap and environment friendly. Being cheaper, locally available and much more environment friendly, it has the potential to replace LPG in rural areas. Biomass can also become the source of bio-fuel which would help in reducing the requirement of petroleum oil.

Total Generation Capacity- Fuel Wise and Sector Wise- April, 2019



Source: Ministry of Power

Nuclear Energy

Nuclear energy also constitutes a significant part of the energy and electricity mix. However, unless the cost of nuclear reactors is controlled significantly, electricity generated from nuclear reactors may not be as cost-effective as energy from renewable sources. Government may consider budgetary support for non-electricity components. Methanol, a liquid fuel produced from natural gas or coal, has the potential to significantly alter the way gas or coal is used. Methanol extracted from natural gas is likely to bring down transportation costs compared to gas, which needs to be liquefied, transported in liquid form at very low temperature (and at a significant cost) and undergo regasification.

The share of renewables in total generation has increased from 6 per cent in 2014-15 to 10 per cent in 2018-19. India has been undertaking one of the world's largest renewable energy expansion programmes in the world.

Energy Security

Improved energy security, normally associated with reduced dependence on imports, is also an important goal of the policy. Today, India is heavily dependent on oil