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2017 : Energy sector set for a bull run



CEA's draft national electricity plan spells trouble for thermal power industry

Union Budget 2017-18: Sops crucial to energise power and coal sector



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ExpertSpeak

Need a single central body for energy policy that encourages right balance of fuel mix

India is striving towards more sustainable and resilient cities which can adapt to rapid change, manage shocks and natural disasters and respond to negative environmental impacts through the provision of energy efficient infrastructure and resources. However, with the climate change agreement in place, India also needs to move towards a clean economy. In this regard, **Richard Slater**, Director, Research, Development & Learning, IPE Global Group, examines the current growth and development scenario and suggests ways in which India can achieve its goals of sustainable development.



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India is currently standing at the threshold of a major transformation. On the one hand, the government is focusing on urban development through initiatives such as Smart Cities and urban growth, and on the other hand, it has taken several steps to encourage the transition to a low-carbon economy. India has already taken this into account and clearly defined its goals in its Intended Nationally Determined Contributions (INDCs) which says that there can indeed be a reconciliation between economic development and the state of the environment, as opposed to the rapid development of many countries in the past that came at the cost of the environment.

A country such as India that is extraordinarily rich in bio-diversity, with species of rare flora and fauna is threatened today, by over-exploitation of resources and climate change. Thus, it is imperative that India is able to balance growth with sustainability in human, social, economic and environmental terms.

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Where are our cities today?

India is striving towards more sustainable and resilient cities which can adapt to rapid change, manage shocks and natural disasters, and respond to negative environmental impacts through the provision of energy efficient infrastructure and resources. In the last two years, the government has also launched several projects in the urban sector such as Pradhan Mantri Awas Yojana Housing for All (Urban), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart City Mission, Swachh Bharat, etc. These schemes aim to improve water supply and sanitation, pedestrian, non-motorised and public transport facilities, slum rehabilitation,

affordable housing for weaker section, ending open defecation and manual scavenging, modern and scientific municipal solid waste and water management across the country.

While these initiatives are moving in the right direction, cities continue to experience increased traffic congestion, air pollution, rising greenhouse gas emissions, and poor public health. Poor city planning is a major contributor to this combination of problems. Lack of reliable infrastructure and poor services have also resulted in a rise in communicable diseases such as Chikungunya and Dengue which have severely affected public health in many cities across India. At least 10,851 chikungunya cases have been reported in Delhi alone in 2016 whilst cities such as Pune registered 2,523 chikungunya cases in October alone.

Air pollution is another major health hazard. Delhi Pollution Control Committee data shows that the concentration of PM2.5 (particles less than or 2.5 micrometers in diameter) peaked at an alarming

883 micrograms per cubic metre post Diwali this year, which is more than 14 times the safe standard of 60 micrograms per cubic metre! Smaller cities such as Kanpur, Raipur, Agra, Patna, Varanasi, etc. are also showing alarming increases in air pollution.

Rapid urbanization also poses the problem of greater demand in the near future. The Government of India's "Power for All" scheme proposes continuous and uninterrupted power to all households and industries by March 2019 with a 132% rise in energy consumption by 2035. The substantial increase in energy demand will translate into higher demand for electricity and increased environmental challenges.

As the Paris agreement on climate change takes effect, India has an obligation to hold global warming to not more than 2 degree Celsius above pre-industrial levels. Thus, there is increasing need for co-operation and collaboration within cities to build resilience. The importance of a cleaner fuel at this juncture cannot be stressed enough.

Resilient energy for smart cities

India's economy is currently heavily dependent on coal – almost 70% of India's power plants are coal-based. As part of the Paris Agreement, non-fossil fuels would account for 40 per cent of India's total energy generation capacity by 2030. However, the share of renewable energy stood at 14.14% as of September 2016, which is not anywhere close to the target that India has set out for itself. Power generation from renewable energy has not been able to meet peak power demand. One of the major constraints of renewable energy is the reliability of power supply. For example, solar or wind power is heavily dependent on weather conditions, hence represents an intermittent and unpredictable supply that is unlikely to be able to meet the demand during peaking hours. Another disadvantage of current



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renewable energy is that it is difficult to generate power at scale.

The answer here is not to pick one source of energy over another. Instead, it is vital to recognize the role that different fuels can play at different stages. Since targets of renewables are quite stretched, the next alternative would be to switch from high carbon emitting fossil fuels to lower ones. For instance, natural gas can absorb infirm renewable energy and consequently, provide support during peaking hours. This would not just ensure the more efficient use of energy from all sources but would help to overcome the shortfalls in renewable generation.

Data on GHG emissions and primary energy consumption by fuel type shows that natural gas results in 60% lesser emission for CO₂e for the

same level of energy consumption as compared to coal. Moreover, it is quite versatile and can be used in process industries and transport. In early 2016, vehicles running on compressed natural gas (CNG) were exempted from the odd-even rule in Delhi. The Supreme Court also ordered the Delhi government to pull 30,000 cabs off the roads as they run on diesel or petrol rather than CNG. All this reiterates the fact that gas is not just cheap but also safer and cleaner, making it a viable source of energy.

'Climate Proofing' infrastructure is another necessary step to ensure the supply of energy in times of floods, higher temperatures and higher levels of precipitation. Solar energy use should also be encouraged for all establishments with floor area of more than 300 sqm.



Both the renewable sector and the gas industry in India have witnessed reasonable growth in terms of demand over the last few years. However, this growth has been uneven with the renewable sector growing by 13.7% while natural gas has shrunk and fallen below the previous year's consumption. In contrast, coal has grown by 4.8% while oil has grown by an astounding 8.1%

Green building standards need to be adopted mandatorily to help reduce total energy demand in cities and building applications should demonstrate the use of climate friendly designs and materials.

Need for integration

Both the renewable sector and the gas industry in India have witnessed reasonable growth in terms of demand over the last few years. However, this growth has been uneven with the renewable sector growing by 13.7% while natural gas has shrunk and fallen below the previous year's consumption. In contrast, coal has grown by 4.8% while oil has grown by an astounding 8.1%. One major roadblock in India is the lack of a single central body that is responsible for

energy policy and regulatory affairs which results in inconsistencies for sub-sectors, i.e. coal, oil, electricity and gas. This highlights the need for a single central body for energy policy that encourages the right balance of fuel mix by incentivizing the overall fiscal and policy frameworks. It is imperative that the central government and state government are in consensus and are willing to create some potential synergies and opportunities that are mutually beneficial.

There are several central and state government schemes across sectors but ultimately, there is a need to integrate all these initiatives in a way that they lead to a more holistic pattern of development. For instance, both Swachh Bharat Abhiyan and Smart

Cities Mission aim for better waste management systems and therefore, it is important that these schemes operate in sync with each other.

Increased private sector participation

Going forward, there is an urgent requirement to attract private players to boost investment and promote PPP projects. Since many investors are cautious of delays and uncertainties, there is a need for government to devise an effective system for the allocation of power projects and a clear methodology for incentivizes investments. Energy Efficient practices should also be incentivized in construction, manufacturing and transportation.

At a fundamental level, there is a need to review obsolete approaches to financing public bodies with tools and support systems that can enhance the ability of cities to plan and implement projects and deliver results. For instance, a system integrator can help map and develop models for meeting the supply and demand for urban infrastructure and services. Such integration can serve as engine of economic growth by providing solutions for high quality infrastructure in the future.

India will continue to witness the growth and development of its small, medium and large cities into the future cities and the process of revitalising existing cities must be carried out without interrupting ongoing activities. To meet these challenges in a sustainable manner, the government will need to reassess how it produces and consumes energy and, together with its stakeholders, work towards a lower-carbon future. It is imperative that such solutions are at the core of India's growth and development strategy. 