

[Inaugural Speech of Padma Bhushan Shri BK Chaturvedi, IAS, former Cabinet Secretary Government of India, delivered on 11th August 2018 at Ex-ONGC Executives Welfare Association's Seminar]

Unlocking the Potential of Renewable and Unconventional sources of Energy in India

Let me start by congratulating the Ex-ONGC Executives Welfare Association for organizing the conference on an area of energy which has gained centre stage in the last decade. A strong participation by former secretaries to government of India, eminent experts of petroleum sector, veterans of oil and gas and Secretary of Niti Ayog is indicative of efforts to bring different stakeholders on one platform for a very vibrant discussion.

Let me at the cost of repetition emphasize why RE is crucial for the global community and for all of us sitting here. The trigger for developing this area was a gradual realization about four decades back by the major nations of the world that development has to be sustainable. In 1987 the Brundtland Report "Our Common Future" was released. It defined sustainable development "as a mode that fulfils the needs of the present generation without compromising the ability of future generations to fulfil theirs". Increase in carbon footprints in the atmosphere is an irreversible process. We had to plan our present while safeguarding the future. Soon enough a series of reports prepared by different panels of UN Inter Governmental Panel on Climate Change (UNIPCCC) gave their findings and analysis. These presented a worrisome global scenario. It was pointed out that CO₂ and other carbon emissions were already unacceptably high and there was a need to control its growth in the atmosphere to slowdown large rise in atmospheric temperature across the globe and major weather changes which may have disastrous consequences. Indian and Chinese economies were growing rapidly. Both are large nations with nearly one third of the global population.

Their energy needs were large and growing rapidly as per capita incomes went up sharply. This gave an urgency to the task of controlling carbon emissions which were primarily the outcome of use of coal and fossil fuels as energy source to ensure high level of growth. The search for alternative sustainable energy resources was now intensified. In the sector while Solar, Wind and Hydro were the major RE source, other sources like Ocean waves, Biomass, Geothermal, were also being used. But the cost of energy from main RE sources of solar and wind was high and not acceptable to discoms. I recall CERC fixing Rs15-17 per unit as cost of solar energy. Wind power source were more competitive but still higher than coal fuel based power plants. It required a technological breakthrough. So as we sit here discussing RE, our major concern is the sustainable growth of our nation and the global community.

Around 2012-13 prices of RE sources particularly Solar became more competitive driven by large technological developments and economies of scale. Due to slow growth in 2000 -

2010 RE capacities in India were only 14 GW in 2009-10 which was about 12% of the total power capacity. Growth in RE picked up once the solar prices fell. This led to a quantum jump in RE based power capacities in India and also globally. In India it increased sharply to 69 GW by June 2018 which was about 20% of our total power installed capacity. If we add to this the Hydro Power as is done by many nations, it was about 33% of the total power capacity. Last year we added 11.7 GW of RE capacity. While at this rate we may not reach 175 GW by 2022 which has been planned by the government, we may be able to add very substantial RE capacity in next four years and increase its share to 40% in our total capacity. Looking at the global picture, our capacity addition is quite impressive. During 2017, the global capacity addition of RE was dominated by three countries: China, USA and India. So first point I wish to make is that we are unlocking the potential of RE at a good pace. But then where is the worry?

This brings me to my second point. There are still large capacities waiting to be unlocked .In 2011-12 a team of Lawrence Berkley lab of USA had visited India and assessed that we have a potential of 2000 GW of solar and 1000 GW of wind capacities including off shore potential for wind .Many feel that it was a not well researched assessment. According to a study by IIT Kanpur published in March 2015 the RE potential in India was 1100 GW including 750 GW of solar and 302 GW of on shore wind. This could go up once off shore wind potential is added to it. Even if we take these more conservative potential figures, it is clear that so far we have been able to exploit only less than 6-7% of the potential. So 94% of it is still waiting to be exploited. There is a clear need to step up pace of RE capacity addition.

This brings me to the third issue which I wish to raise. This is about the absorptive capacity of our energy system to use this unlocked RE potential. This power by its very nature is infirm and has large variations during the day and in different seasons. As its share in our total power capacity increases further to 25% or 30% there will serious problems in providing continuous power to users unless we use larger balancing power and easy ramp up power plants to even out the variation in power generation from RE sources. We may also need technology for energy storage. Power load dispatch management would be crucial to keep power flowing. Transmission of this power will raise a different set of problems. Due to the nature of RE generation plants, large investments will be needed in transmission capacities. This may add to the cost of power received by the users and may effect demand. Also, the cost of undeveloped RE potential may gradually go up reflecting difficult potential areas. Strong focus on technological developments will be needed to ensure that this power remains competitive. All these are areas which would need effective resolution for absorbing RE power.

Let me now focus on the fourth issue which is critical for economy as we unlock the potential. This relates to the oil companies. It is clear that demand for petroleum sector will slow down as renewable energy picks up. But all studies indicate that even by 2050 there will be use of this resource in sizeable volumes. Niti Ayog in its assessment of draft energy policy last June assessed that by 2040 the use of oil will be about 413 million tonnes which is nearly double of current consumption. IEA in its projection has assessed the demand as

nearly 8 million b/day which is more than two times of current consumption. All this indicates that while the strategy for oil companies would have to include a strong focus on clean energy, there will continue to be a large oil sector segment.

Some of the demand for transport of oil sector will be met by electric cars. There is a great focus globally on electric cars to control pollution in cities and government is planning a total switch over by 2030 according to various announcements. Even if we were to discount this as a bit of over ambitious projection, it is clear that very large number of such cars will come in the market every year in the coming decade. Given the limited range of such cars, we will need charging stations across the country to enable smooth movement of these electric cars. Oil companies must see this as an opportunity and use their oil distribution network to distribute batteries for cars and provide charging facilities for such electric batteries. A lot of technical work will be required before this transition can take place. But this is doable. This only emphasizes the need for new business models as share of RE goes up.

There are also huge opportunities in providing power from Large Hydro plants and Nuclear Plants. Both these will provide clean energy with little emission of harmful gases. Nearly 50 GW or more of Hydro potential remains unused from north eastern states. Also pace of nuclear capacity expansion has been slow and we can expand these to 60 GW or more by 2040. The creation of new capacities will be constrained by our ability to complete work on these plants. Our initiative on fast breeder reactors will provide support to these initiatives.

There is clearly huge potential in the RE sector waiting to be unlocked. But the supporting infrastructure, absorptive capacity of the system and health of Discoms which will buy this power will be a constraint. Oil companies will need to reorient their strategy to continue to meet the market demand and be financially strong. They and the power companies will need to align with changing energy scene. That will be a major challenge for them. If they do so, our energy sector will become aligned with global and national needs. The unlocking would then be successful.