Keynote Address by Mr. R. V. Shahi
- Former Power Secretary, Government of India

(By Niladri Roy for Climate Connect Technologies)

Mr. Shahi was chief guest and keynote speaker at our (February 2018) Industry Roundtable event in Delhi, on how AI & ML can enhance the Indian Energy Sector and help achieve broader national development goals.

After such an illustrious career, he spoke about a few key topics. Weaving in some personal stories, around the starting theme of how India's marked generational divide between old and new remained a hinderance to progress, both in the Energy Sector and more widely.

But far from any hand-wringing, he positively but candidly reframed the status quo as an opportunity to learn and grow. As a young company trying to bring inherently complex and fast-evolving technology knowledge to the sector, country, and world, this resonated with us very much, leaving an enduring sense of optimism.

Here are the venerable words of wisdom he imparted.

- - - - **The following is an edited transcript and divided into parts by theme** - - - -

Part 1 – On the generational divide and the opportunity of harnessing it

" Friends and colleagues. I have had the privilege of working with many of you. A large number of you are here from various different organisations.

A few days back, Mr Kaushik (Climate Connect, Director of Business Development) *and Mr. Mehta* (Advisor to Climate Connect & Secretary General SAFEE) *met me to discuss this subject* [AI & ML] *and its applicability in the Energy Sector. Obviously, so far as working with data, the analysis of data, and computer systems, a whole range of technological developments have always been there. The only difference is that now things are moving very fast.*

When I was young, my mother asked, "What moves fastest?" Me and my sister said light, or sound, and she proved us wrong. Saying, "It is the mind and thought which moves fastest".

If you think you are in the White House, then immediately you can be there, sat at a table or a chair. So thought moves fastest, just as our young generation moves faster than the old.

And it is a great thing that we have many retired people here, who have worked in various capacities in the Power and Energy Sector, alongside the youngsters, so that we can try to marry the two. Though it is difficult for the older generation to reconcile with many of the things that can happen and should happen.

In the middle of my career, one of the subjects we used to teach and learn, was management of the Intelligentsia. One the things we used to tell our senior people – the Heads of Department and General Managers – that things are changing fast, and it would require a great deal of skill, and a greater degree of understanding in how we manage the younger generation

We used to ask them, "if you do not know how to work with a computer or laptop, and others do, is it a thing you should feel ashamed of? Is it a thing that you should avoid? Or is it a thing that you should encourage?"

Most of us working in various capacities needed to acquire, but failed to acquire that ability to accept that 'in certain areas my junior knows better than I know', and how to reconcile this. If we do not learn, and we do not accept, and we do not reconcile, then the loser becomes the organisation where we work. We will not get the best out of the team that we are supervising. We must understand that a team leader may not know as much detail as his juniors on a variety of subjects that each one is learning.

So as far as I am concerned, I tried to learn the art of telling people in a very straight forward way, that if ten of you are working with me, I know less about your subjects than each one of you knows. I know only a little bit of each of those subjects. That disclaimer takes care of that barrier. The moment I start thinking and start trying to prove that I am better than each one of them in each subject, is when problems are caused. So that conflict is so true, in every aspect of knowledge, in every aspect of management, but it is most true when it comes to technology subjects.

Today, if I get into problems on my mobile phone, I really learn from my grandson. He knows better than I do. In fact, most of the applications on my phone and tablet, I have learned from my grandson, who is in Class-10. So if I can reconcile that, and feel proud that he knows better than I do, why not in a working situation?

In a working situation we try to pretend, we try to prove, we try claim, that the fellow knows less than we do. Therefore, he should be quiet, know his place, etc, etc. Every organisation suffers from this. I think this is an important subject, and with all humility, I have laboured the point for a few minutes. When I was having tea earlier and I saw our old friends, most of them having crossed 60, 65, 70, and the younger from several countries. I thought that we should embrace such subjects with that type of attitude and that type of approach. Then it becomes a winning situation. It is one we must learn. Sometimes we have a tool and we are unaware of its power, and what we can do with it. "

" So, coming to the Energy Sector, and the Power Sector particularly. Often, out of frustration, we start coming to the conclusion that nothing works in the Power Sector, including Artificial Intelligence. We do not quite reach that conclusion, but many times out of frustration we start thinking like that through all the ups and downs.

These days, one things I do is chair the task force of the Rajasthan Power Sector, and over the last three years we have been struggling. So what do you do in that situation? You have smart meters, you have the best of meters, which in milliseconds or microseconds can tell you what is happening. But what happens when you have a group of consumers, who set up a network of distribution transformers, not in terms of 10's, or 100's, but in terms of 1000's, which are unauthorised and drawing power from substations? That whole segment of consumption is not in your system, so what do you do? Excessive consumption can only be controlled when it is on your system.

Way back in 1998, when I worked at Mumbai Electric, we introduced control of excessive consumption, and inadequate consumption. We tried to know who was responsible for the theft of electricity. For example, if consumption was 30,000 rupees month after month, then suddenly for the last three months it dropped to 3000 rupees, an exception report would be generated, and we would start sending people to investigate. But if the whole thing is out of your system, what do you do? Yesterday's news that Punjab National Bank has a problem, not in terms of 100's or 1000's, but 11,000 Crores, because things are happening outside of the system, month-after-month, year-after-year.

This is where AI and data analytics have emerged to do wonderful things in this area, and many others. Such as disaster management, perhaps it can predict Tsunamis, maybe not a month ahead, but perhaps a week ahead. In India we used to say that "we wake up only when disasters happen", but sometimes that is also true globally. In India maybe, we wake up after ten times, in other places maybe once it happens. There is some degree of delay everywhere, but this is such a powerful thing.

The other day, I was talking to an industrialist who deals with logistics, about what the possible applications of data analytics could be in making the lives of his people more comfortable. Say something comes from the USA, or Australia, from the port how does it reach you? That management is very fast, but others are very slow.

At a previous seminar I attended a long time ago, the chief guest was the US Ambassador. He spoke about the 'last mile' problem, recounting how one visit home from India went fine, until he was just 50 miles from home. Those 50 miles took longer than the entire prior time from India, even though he was within the USA. So you can have the best of management, and the best of techniques deployed, where you can. But perhaps because of finances, perhaps because of your attitude to the subject, perhaps because of your knowledge, perhaps because of the company you keep, you can become helpless in delivery.

For example, two or three years back, in a village in the Chhapra district of Bihar, 40-50 children consumed some poisonous food and fell ill. Both the local and district hospitals lacked the facilities to treat that many. Even Patna Medical College, which we were so proud of, did not have sufficient equipment to treat them.

So, when it really comes to delivery in a country like India, this is the contradiction. We have the most sophisticated things in NTPC, the most sophisticated things in Power Grid, and maybe some districts. But when it comes to delivery, it's quite the contradiction we are facing in India today. 335,000 MW of generation today, yet we do not run more than 150,000 MW, less than 50% of capacity. There was a time when the problem was that we didn't have capacity, with a peaking shortage in the range of 25% in many districts, across many states. Today we have capacity, today we have 335,000 MW, with a demand of 155,000 MW even in peak summer season, and then we have load-shedding. How is that?

So now, AI is [still] very far, it should predict in terms of minutes, in terms of seconds. But, there are things which are already available, predicting. There is no question of prediction. 'Prediction' is a highly demanding word, something which is there, a status which you know. And not just know today, but you know day in and day out. I think an economy like India has to resolve problems of this nature, of course it has to. Like when a Tsunami comes, it has to happen. But economies like India also have to resolve issues where do you not need to know minutes, hours, or days. You may have the situation of weeks together, or months together, but still these remain unresolved. So technology has to be useful to us in doing both.

Some time back, two eminent persons of the country, one was a Petroleum Secretary, the other a technocrat chairman of a company. And the discussion was, that this Petroleum Secretary wanted online data in his room about what is happening in the petroleum sector. And this gentleman told him, by first name as they had a close relationship, "you want this online, only to sit on paper for months before anything is decided. So why do you need this data online when you are deciding in weeks and months?". When I was in the Ministry of Power, at times we had at least half a dozen proposals for PIV pending in the expenditure department, and we struggled to get meetings for the department. Anything from 6 to 9 months, you were lucky if you got them in 3 to 4 months. So, I think technology has to solve contradictions of this nature, as well as the contradictions that you have which are instantaneous.

Part 3 – From the early days of the Indian Power Exchange to today

I discussed in 2004 or 2005, with the Energy Secretaries of several states, assisted by their eminent Chairmen and Managing Directors of various companies, that we want to do power trading in India through an exchange. The Power sector, when you ranked the various sectors of the country maybe 15 years back, so far as embracing the latest technologies and thoughts are concerned, acceptance and orientation, I would have ranked the Power sector very low. So, to talk with these various state secretaries, and the MD's of the corporations at that time, people laughed at the idea.

A sector which very few even knew prior to NTPC. That first power purchase agreement was a two-page document with the UP-State Electricity Board. Generation, transmission, distribution, all bundled together in one city board. People didn't even know what commercial transactions between entities were. Therefore, we messed up the sector, the Power sector was the least technology-friendly sector. And I would say we have not gone out of that mindset even today. It has taken me three years to convince a comparatively progressive state – Rajasthan, which is not as bad as my old state Bihar – even in that state it has taken three years to register 80% of users, after month after month of trying. We want to provide a number of services telephone, on mobile, through WhatsApp. We should be way beyond WhatsApp, we just want to tell them if a line outage is coming, when a plant outage is coming, the status of their request for a new connection. Not a great expectation, but we are still at least four or five years behind in even

rating, or thinking of this expectation. To make people aware of the power of communication, the power of 'digital India'. I think technology can do wonders, it can provide instantaneous, or sometimes even before events happens. But you have to convince people to see whether it works.

We sent a team to European countries to study the Power Exchange process, and the only reason I stayed associated with the Indian version, was to ensure that it worked and established itself. We started with day-head, today we are doing hourly and 15-minute. From the two-page document between NTPC and the UP-State Electricity Board, you now have a more professional document in which the accountability and obligations of either side are set out. But important today, is that over 25-years we've gone from 10-year PPA's, to 5-year, 2-year, short-term, and other arrangements. Hourly and 15-minute agreements, for sale and purchase, etc, etc. This is happening even in a less technology friendly sector like Power.

But one thing is important in such a sector - if you convince people a market is there, it is a commodity that everybody needs. Maybe soon everybody will have access to power. So, this sector provides a base, a platform, upon which technology can not only be tested, and prototyped, but also commercialised. We are seeing the wonderful results that are coming in Solar, in CFL and LEDs. Because the base of the Power industry is so huge, that if you are able to establish the relevance of what we are talking about [AI & ML], the relevance of the technology, with a little gestation of the thought process, then a technology can establish itself. Because to move from research, to prototype, to commercial, there needs to be a market. If the market size is small, and the research cost is high, there will be a shyness in acceptance, because who will subsidise the development of such technologies. So, the one thing the Indian Power market provides is that, and it is so huge.

Part 4 – Parting advice to the young

From 2012 to 2017, we did not expect to achieve the huge reductions in cost for Solar. This has happened because of the base. Various companies under the Government of India have done wonderful things. So I think now technology development has a good chance. That is an encouraging thing for youngsters like you. But we need to establish the validity first. We need to first understand even the minutest problems. I have given you a flavour of some of the problems, like if people bypass the system. I asked that question to our developers in 2002/2003 – do we have meter that can sense when it has been bypassed? A meter can be smart, but has the smartness reached a sufficient level? In the Power sector we have done wonderful things, and I must say that our engineers, technologists, and others have now accepted all types of developments. And we should be proud of our Generation system, our transmission system, the technology adopted and adapted is second to none, and many wonderful things are happening here. But when it comes to managing distribution, there lies the problem, and AI can address this, to catch the person who is setting up bypasses unauthorised. Not tampering the meter, because that can be captured, it is still on the meter. But bypassing. Or a distribution system is set up to supply power to 1000's of people whose record is not there with the supplier, how do we capture this?

So understanding the management of distribution systems can make you very rich, maybe a millionaire. Provided we have gone to and solved 'the last mile'. 'The last mile' should be universalised, because it is a problem in every sector, not just Power.

Thank you very much.