



# Twentieth Darbari Seth Memorial Lecture

on the occasion of Mr Darbari Seth's Birth Centenary

100 YEARS



## Energy Transition and Way Forward for India

Delivered by

**Dr Praveer Sinha**

CEO & Managing Director, Tata Power Company Limited

Presidential Address by

**Shri Bhupender Yadav**

Hon'ble Minister for Environment, Forest & Climate Change; and Hon'ble  
Minister for Labour & Employment, Government of India

**Darbari Seth Birth Centenary Special Addresses**

**Mr R K Krishna Kumar, Trustee, Tata Trusts**

**Mr G Narayana, Trustee, Tata Trusts; Chairman Emeritus, Excel Industries Limited**



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**Topic – India's Achievements in Addressing Climate Change**

**WebEx Virtual Event by The Energy and Resources Institute (TERI)**

**New Delhi, August 24, 2021**



**THE ENERGY AND RESOURCES INSTITUTE**

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# WELCOME ADDRESS

## Mr Nitin Desai Chairman, TERI



Honourable Shri Bhupender Yadav ji, Dr Praveer Sinha, Mr R K Krishna Kumar, Shri G Narayana, members of the Seth family, and all the people who have joined us (either online or through YouTube): I welcome you to the twentieth Darbari Seth Memorial Lecture today. I worked briefly in TATA's and met Darbari Seth during that time and must say he was a very striking person to anybody who met him at any time. He was a founder who set up TERI, basically, long before people used to worry about issues such as energy. And, the institute was called the Tata Energy Research Institute and later it developed as a very independent institute and has broadened its area of work beyond energy into other resources also—which is why it is called The Energy and Resources Institute. It has become a large institute, which does a wide range of work including hard research on technologies, which could promote sustainability, besides advocacy and other such areas of work. We are really very privileged that we have very distinguished speakers with us today. So, let me begin first by introducing our main speaker—the Presidential Address would be delivered by Shri Bhupender Yadav, Hon'ble Minister for Environment, Forest & Climate Change; and Hon'ble Minister for Labour & Employment, Government of India, and also Rajya Sabha Member. He is a person who actually has had a connection with environment. As a Supreme Court Lawyer, he was involved in environmental issues and he has written a book about the connection between

forests and the Supreme Court Judgements. So, he comes to this job with a significant commitment and interest in this issue. Therefore, we are very privileged to have Shri Bhupender Yadav speaking to us. And now I invite him to address us on the topic 'India's Achievements in Addressing Climate Change'.



# Presidential Address

## India's Achievements in Addressing Climate Change

**Shri Bhupender Yadav,**  
**Hon'ble Minister for Environment, Forest & Climate Change;**  
**and Hon'ble Minister for Labour & Employment, Government**  
**of India**



Thank you Shri Nitin Desai ji, Chairman TERI. Excellencies, distinguished guests, ladies and gentlemen: A very good evening to you all. It is a great privilege to be invited to preside over an important event in TERI's annual calendar—Darbari Seth Memorial lecture. Mr Seth's life and work embodies the message that business leaders should not only be concerned with profit, but also care deeply for people, planet, and peace. He made great contribution to the building of modern India and the growth of our industrial capabilities. Through this event we are honouring a person who has not only been a champion industrialist, but also a champion of energy conservation and environment protection. His interest in environmental dimension made him to establish TERI back in 1974. In today's world, we see the importance of environmental dimensions in the path of economic development.

Today, there are global environmental challenges, and while addressing these we need to focus on improving human development and meaningfully achieve the sustainable development goals (SDGs). As a nation, we have undertaken various national campaigns recently, which mirror our focus on the SDGs—be it Jal Jeevan Mission, Swachh Bharat Mission or Skill India—all programmes aimed to do just that. The Government

of India under the leadership of our honourable Prime Minister Shri Narendra Modi ji has taken a multi-dimensional approach to all the pillars of sustainable development. Key measures include climate action, biodiversity conservation, forestry and land neutrality, waste recycling, phasing out single-use plastic, organic farming, and clean energy.

India is on track to achieve and even exceed the target, under Paris Agreement to combat climate change. India's climate actions are rated highly in many independent assessments. As per the *Climate Transparency Report 2020*, India is the only G-20 nation on track to meet its climate commitments. India has achieved 24% reduction in emission intensity of its GDP between 2005 and 2016, thereby, achieving a pre-2020 voluntary target. India is among the top 5 countries of the world in terms of installed renewable energy capacities. India's non-fossil fuels-based installed capacity of 151 GW is around 39% of the total installed capacity. The Honourable Prime Minister of India, Shri Narendra Modi, has further announced the aspirational target of renewable energy capacity of 450 GW by 2030. The Honourable Prime Minister in his Independence Day speech 2021 announced the National Hydrogen Mission for generation and export of green hydrogen. India's total forest and tree cover as reported in *India State of Forest Report 2019* is 807,276 sq. km, which is 24.56% of the total geographical area of the country.

Total carbon stock in the country's forest is estimated to be 7124.6 million tonnes showing the increase of 42.6 million tonnes compared to the previous assessment of 2017. India is one of the 16 member countries of the electric vehicles (EVs) initiative, a multi-government policy forum dedicated to accelerating the introduction and adoption of EVs worldwide. India is implementing the faster adoption and manufacturing of EVs in India scheme to support the EV market development and its manufacturing ecosystem to achieve self-sustenance. India has leapfrogged from Bharat Stage IV to Bharat Stage VI emission norms by April 1, 2020, which was earlier to be adopted by 2024. Indian Railways is targeting full electrification of broad gauge routes by 2023. Indian Railways has set a target to becoming net zero carbon emitter by 2030. Accordingly, Indian

Railways organization to alternate green fuel vertical of Indian Railways has invited bid for hydrogen fuel cell-based train on railways network.

Ethanol blending in India has increased from 1.5% in 2014 to 8.5% at present. In 2013–14, about 38 crore litres of ethanol was purchased in the country, which has now grown to more than 320 crore litres. The Government of India has resolved to meet the target of 20% ethanol blending in petrol by 2025, which was earlier to be achieved by 2030.

Under the Smart Cities Mission, a first-of-its-kind initiative—Climate Smart City Assessment Framework 2019 has been launched with the intent to provide clear roadmap for cities in urban India towards combating climate change through adoption of both mitigation and adaption measures. India in partnership with Sweden launched the Leadership Group Industry Transition Track in European Climate Action Summit on September 23, 2019 in New York. The government is also supporting adoption action of states and union territories of India through the National Adaptation Fund for Climate Change.

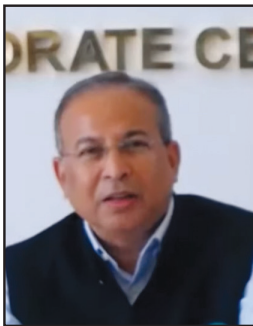
In the spirit of cooperative approach for global outcome, India and France work together to create the International Solar Alliance (ISA), which has been a treaty-based organization open to all members of The United Nations. So far, about 79 countries have ratified the ISA Framework Agreement. Through the ISA and our bilateral development partnership, India is already working to enhance capacity in our neighbourhood, Africa, Asia, and Latin America to deploy green technologies in support of development. A similar approach underpins our Prime Minister's initiative on creation of the Coalition for Disaster Resilient Infrastructure. Here too, we have scripted a cooperative approach to build resilience in infrastructure, transport, communication, building, across the globe, especially in geographies susceptible to natural disasters. The objective is to find best-in-class solutions that are readily deployable, scalable, and affordable so that the consequence and the cost of managing natural and other disasters are mitigated substantially.

While I listed a number of Indian initiatives, actions and the achievements so far in the area of addressing climate change, these examples also highlight the need for a more responsive, multilateral approach in which all countries take their fair share of burden in responding to the global threat of climate change. Often, we see very complex and contested discourse on climate change. However, science is very clear. The recent IPCC report has sounded “Code Red”. The findings reaffirm that historical cumulative emissions are the source of the current climate crisis. Equitable carbon and development displaced to achieve sustainable development require due consideration to the principle of common but differentiated responsibility and respective capabilities and polluters pay. Climate change mitigation is necessary but not sufficient. Even if the world stops GHG emissions today, hypothetically still the accumulated greenhouse gases will lead to climate impact requiring due consideration of climate change adaptation measures. Developing countries are highly vulnerable to climate change impact due to the dependence of large population on climate-sensitive sector for livelihood. Long-term strategies need to be guided by not only mitigation but also by climate adaptation with a clear roadmap for provision of finance and technology. There is need for sustainable lifestyle as patrons of consumerism are grave threats to the environment. Habit and attitude are much a part of the solution. Equity and climate justice should be a touchstone of any global climate response. Only then we can say that we have formulated strategies that are just and in reverence for Mother Earth—our only planet and there is no planet B. I thank you for being such patient listeners. Thank you very much.

# Twentieth Darbari Seth Memorial Lecture

## Energy Transition and Way Forward for India

**Dr Praveer Sinha,**  
**CEO & Managing Director, Tata Power Company Limited**



Thank you Mr Nitin Desai and thank you TERI for inviting me to speak on the 20th Darbari Seth Memorial Lecture. Good afternoon Shri Bhupender Yadav, Honourable Union Minister for Environment, Forest and Climate Change; Mr Krishna Kumar, Trustee, TATA Trust; Mr Narayana; Mr Nitin Desai; Dr Vibha Dhawan;

associates from TERI; members of Shri Darbari Seth's family and all the dignitaries who are attending the webinar today. It is my great honour to be amongst all of you on the special occasion to celebrate the 100th birth anniversary of Shri Darbari Seth. He was a true leader and a visionary. It wouldn't have been more apt for me than to share my thoughts on the topic, which was very close to his heart—Energy Transition and Way forward for India.

Mr Darbari Seth was known to be the man with Midas touch and he was as a leader always much ahead of his times and promoted indigenous industry to build the best-in-class manufacturing infrastructure. In fact, he was so concerned about the enormous quantity of energy that is being used in chemical factories because of the desalination that was being used over there for water. And to tackle the depletion of natural resources, he agreed to utilize the share of profits of TATA Group of companies for the larger social purpose and thus TERI—at that time Tata Energy and Research Institute—was formed in 1974. It was much before people in the world started talking about climate change and the social responsibility. It

was through the work of TERI, which has been there for nearly more than three decades, where they have brought about huge amount of research in the area of energy, climate change, and sustainability. And its relevance is very much there—in fact more than it was before.

Climate change is something which is real and we are talking about it today because there is a certainty that our activities in the last few decades have accelerated the change to a worrisome level, of which we are not very proud of. In the recent weeks, the IPCC Report was all over the media, which flagged that India will face irreversible impacts of climate crisis. And they expected heat waves and heat stress will be more frequent and intense during the 21st century. This is because of glacial retreat in the Hindu Kush Himalayas along with the compounding effects of sea-level rise and intense tropical cyclones leading to flooding along with erratic weather patterns. The Indian Ocean, both the Arabian Sea and Bay of Bengal, is expected to warm much faster than the global average. The Himalayan snow cover has reduced since the beginning of the 21st century and the glaciers have thinned also. We have seen in recent times, the spate of flooding and landslide disasters in high mountain regions of Uttarakhand, Himachal Pradesh, and Sikkim, which have been triggered by glacier breach, sweeping away of valleys and many more such calamities in the North-East, killing more than 20,000 people in the last 1 year.

Furthermore, as per the NASA's studies, few Indian coastal cities will be submerged up to 2–7 feet by the end of this century putting great threat to the port cities of Mumbai, Mangalore, Cochin, Paradeep, Visakhapatnam, and many more. This is not just seen in India but all across the globe where in the last decade massive fires, floods, and scorching heat waves have been seen, which have impacted the local climate in those countries. Not just in natural catastrophic effects, but the warming world is also affecting agriculture, and food security, which is having huge impact for a country like India. What could possibly be the next thing? The melting of the Arctic permafrost, which releases billions of tonnes of CO<sub>2</sub>, or the abrupt transition of the lush Amazon rainforest into a dry Savannah. Alarms have already

rung across the globe and we all need to come together, to find a solution to this phenomenon, which has been mostly human created.

Thankfully, we do recognize the power of collective efforts and this has been seen worldwide having faced the imminent threat of COVID-19 during the global pandemic. We have seen how our efforts together have helped in tackling this and coming up with solutions to address the challenge before us. We need much more collaboration going forward. Unlike the COVID-19, this time we know the causes, the stakes and the benefits of taking proactive measures as early as possible. And what is the way forward if we have to comprehensively address this? Just before the CoP26 in November, we have woken up to the fact that the world may lose the opportunity to keep global warming below 1.5 degrees above the pre-industrial levels. The 1.5 degrees or 2 degrees global warming threshold is likely to be breached maybe in the next 20 years. And this is happening when all the countries globally are talking about switching to net-zero emissions by 2050. This may be too late. The mitigation and adaptation strategies by nations through the Paris Agreement to keep the global warming under 1.5 or 2 degrees are proving very insufficient and we are quite off the target.

Without rapidly cutting the carbon dioxide emissions, to net-zero levels in the next one decade, we are headed for a 3-degree increase, which will make the weather conditions extreme with dangerous disruptions in the climate. It is high time that the developed countries seal the deal on adaptation finance and clean technology partnerships. And the rest of the emerging economies work to ramp up their plan. But, there is some good news. In 2020, in spite of COVID the growth of renewables exceeded far beyond the expectations—about 82% of the global new energy capacity addition came from renewables with solar and wind contributing nearly 91%. Out of which nearly 50% actually came from China and 5% from India. The price of solar PV has dropped 90% since 2010 and so also the price of wind energy has dropped and storage solutions as well. The question being asked “is this good enough?” While the power sector, which consumes nearly 17% of the global energy is poised to source

more of renewable energy—the larger chunk of consumption nearly 51% comes from heating and cooling and another 32% comes from transportation, which requires much higher level of carbon reduction. As the world modernizes and urbanization takes place and people become more and more aware about their challenges, electric mobility can become the next big thing. It is very essential that we move quickly to the electric mobility so that our share of renewable resources to generate renewable power and use that for electric mobility can keep pace with the changing requirement.

I think the way the clean and new technology can play a pivotal role in distributed generation and storage solutions along with electric mobility can enhance the pace at which we can reduce the climate change. The three Ds of decentralization, decarbonization, and digitalization will help us to disrupt and drive the energy transition in the race to zero. As India grows and our urban population grows in the coming decades it is expected that we will contribute nearly 20% of the world's urban growth by 2050. This clearly means that we need to double our energy requirement and also the demand of energy will go up. The question that we need to ask is—“Which energy sources will power India's economic growth? Renewables or fossil fuels?” Fossil fuels actually today account for nearly 60% of the country's total primary energy supply. While industries and households—both rich and poor—will be able to get affordable energy if we transition to the renewable energy option only. The choice is of how polluted or clean the Indian environment will be depending on the important implications of climate change and health of people. And particularly given the country's heightened vulnerability to climate change due to its reliance on agriculture, proximity to rising sea levels, and high levels of poverty.

By 2030, India will have nearly 23 million electric four-wheelers and 300 million electric two-wheelers. So, the electrification of transportation is a necessity and is very imminent. Also, India is targeting 450 GW of installed renewable energy capacity by 2030. And majority of that will be solar energy; in fact nearly 60% will be through solar energy, followed by wind. And that gives a great opportunity to India to



become the forerunner and position itself to drive the change of renewable energy that will happen in the country.

India today is 4th in the world in terms of installed RE capacity, and 5th in solar and 4th in wind energy. Demand-side interventions to enhance consumer participation in energy transition investment in infrastructure development will enable integration of variable energy and make it something which can be used 24x7 along with the development of green hydrogen, which is expected to get enhanced in the next decade.

Renewable energy has grown at a very astonishing pace in recent years. Thanks to the plummeting cost of solar power. India has more than doubled its RE capacity in the last five years. And this has been driven both by sustainability but more by the lowering of costs. This requirement will mean how do we move towards a larger chunk of RE and create a sustainable solution. The question that comes here is—does India have enough resources and technology and is the supply chain well established to achieve and secure its green plan? While the Government of India is ramping up its plan to promote manufacturing in India as also renewable policies to support them, but this needs to pick up pace. It will be critical that policies—both economic as well as foreign—are developed together to extract maximum value from India's resource potential and to reduce its dependency on other countries to achieve self-sufficiency.

Today, India has world's fifth largest reserves of rare earth metals—nearly twice as much as Australia. And India has excellent geological potential of rare metals like lithium, thallium, vanadium, nickel, and the platinum group of elements. But India still depends on others by importing large quantity of its renewable products—whether it is solar cells, modules, or even the wafers that are going into the manufacturing of solar panels. And so also the lithium battery, where it is still importing a large quantity from other countries. India does require technological edge, which can be used for processing of these metals and minerals and the capacity to manufacture renewable products including batteries, and other storage solutions. We need to make India energy secure and we must consider the need to promote domestic production of renewable technology by supporting

manufacturing in both the public and private sector along with large investment in research and development to harness the available resources. For this, we need to align with global partners who work on industrial reform encouraging foreign investments. In summation, a sustainable power sector is both necessary and desirable to achieve India's growth in renewable energy. And in this journey, TERI can play an extremely critical and important role not only in policy area but also to create an ecosystem of research and development application engineering start-up and innovation so as to bring clean and affordable energy to millions of people in this country. The mantra should be to think big with the objective to make 'One Sun, One World, One Grid' a reality so that we can demonstrate leadership in both thought and action in the energy transition in the coming decades, which I am confident we are capable of achieving. Once again, thank you all for the opportunity to be amongst all of you and my best wishes to TERI. Thank you.

# Darbari Seth Birth Centenary Special Address

**Mr R K Krishna Kumar**  
Trustee, Tata Trusts

*Topic-Energy and the Mirage of Progress*



Thank you Mr Nitin Desai, Honourable Minister Shri BhupenderYadavji, ladies, and gentlemen, before I come to my main subject, I refer to my association with the late Mr Darbari Seth. I had the privilege of working very closely with him. And as for the time is concerned I contacted him in 1967, there was no doubt—I was chatting with a genius. I started working with Tata Chemicals

after completing my Master's degree in Chemical Engineering from the University of Cincinnati, USA. In Tata Chemicals, there was a transformation because they transformed what appeared to be a sunk company because of process of water shortage by just going to harvesting sea water. Tata engineers made full requirements of the plant in Mithapur, they also generated enough drinking water to be distributed in the surrounding villages. In the process, we were able to produce enough salt as a free byproduct, pure in nature and could suitably address the issue of thyroid deficiency in many hilly districts. Today Tata Salt is by far the largest selling brand of salt in India. He was on the Board of Tata Sons, a holding company in the group and in his capacity he was associated with many companies of TATA group where his innovative skills and achievement and leadership qualities, were transformational in nature.

He started TERI because he had a passion for curbing energy consumption, in both the industry and society as a whole. He was

a true visionary, a great business leader, and also a man of great courage who could take bold decisions swiftly. I am thankful to TERI, for having invited me to speak before you and participate in this major event to celebrate 100th Birth Anniversary of Shri Darbari Seth.

Energy is a universe itself at its most fundamental level; in physics energy is defined as work done. In other words energy is a force that moves all objects in the universe. In classical physics, there are three laws in the system of thermodynamics which are of profound philosophical implications. The first law states that the energy is neither can be created nor to destroy. It may change its form but is always conserved. Second law states, when work is done and energy is consumed only small part of the prior energy is consumed. The balance it transforms into another the most serious puzzle for the universe, phenomenon of entropy. The entropy which is state of disorder or chaos also maximizes. No one knows where entropy goes. The third law says when system's entropy approaches only in constant value as the temperature approaches to absolute zero. Entropy is like time which is always unidirectional, it only goes forward. Nothing in universe defies the second law, not even in the living matter. It is a directional energy that transforms an arrow of time in the destiny of the known universe. The energy prior to work happens, it is important to note that energy always generates entropy and leaves behind increase in quantity of innate material as waste substance. The higher is the use of energy, large will be the amount of waste generated, something that development economists tend to ignore.

The nature of energy incorporates three fundamental constants which these are (a) residence time of energy in any medium is relatively short and transitional and (b) some of the energy is mysteriously lost, the entropy, and (c) generation of energy leaves behind lot of waste matter. The narrative that flows out of these constants, on the basis of what I am talking about. Energy takes many forms, but basically it is concentrated on the heat transfer. Until by the 19th century, the generation of energy was always based on renewable resources as a fuel. There

was, in general equilibrium between generation of energy, the application of energy, and the sustainability of fuel resources. It is in the 20th century that the delicate balance was being lost. An energy using system can be said to be imbalanced when the consumption of energy is more or less stable and is proportionate to the sustainability of fuel. However, energy generated is fierce, driven by relentless rise in consumption as it happens today and it leads to increase in degeneration of the environment, mounting masses of wastes of material and this is central crisis of the 21st century, if you take the entire population of human beings of the planet as one integrated system in the society. It could be seen as only one tiny minority in the entire world, dangerously tilting the energy balance of the globe on one side, leading to large-scale catastrophe in different parts of the world, besides, has generation of waste materials and it is impossible to handle including nuclear waste without impacting the environment.

How many knows that the so-called developed world is quietly shipping even e-waste material, residual products of high energy consumption to many African countries as used articles. For example, millions of people are using mobile phones, laptops, toys, digital cameras and other electronic devices as e-waste are being shipped, according to the United Nations and to the developing world. Many of these articles also contain toxic, hazardous materials such as lead, cadmium, arsenic, and so on. The poor of the developing world are unwittingly drawn and exports in order to make a living. One of the chief characteristics of the economic development is the intensification of the energy use. There is concentration of high energy density which is the amount support given to an energy the system per unit volume embedded in all economic development strategies. The bulk of the energy generation today is from non-renewable energy resources, mainly fossil fuel.

The developed world including China's central objective is to capture fire energy-generating resources across the planet with no concern at all for sustainability. The overriding purpose in the 20th and 21st centuries is for nations to drive so-called economic growth measured as gross domestic product. The chase

for increasing GDP at any cost is today the disabling obsession of nation states. It must be noted that increasing GDP does not result in balanced economic growth, covering all sections of society. In fact the rapid economic growth results in increasing more wealth in fewer hands and even fewer countries.

In contemporary times progress is said to follow new technologies and it is argued that there has been significant progress with technologies in the world which has brought about huge wealth creation and progress. But in history there is no demonstrable correlation between progress and technology and progress in general. Take for example the present COVID crisis, a product of technology developed for deliberately creating bio-toxic material has severely impacted the globe. So is the sinister emergence of cyber-attacks. A new and invisible dangerous method of disabling the global infrastructure. There is a dark hidden side to many technological developments. For example, medical advances for society as a whole are moving on only on unequal basis. It becomes too expensive for poor in many parts of the world. Secondly developed countries are holding Intellectual Property Rights (IPR) which will be available to the rest of the world at great cost, again widening the loss. There is a hidden transfer of future value to IPR, piling up in the developed world. To sum up, the 21st century technological projects have not created a level-playing field with rest of the world as a whole. Therefore, it is an unequal blessing. It is the increased wealth for the minority whereas in fast populations in the developing countries, poverty has tended to increase. There has been no democratization in wealth results in well-being of every section in society.

There have been several attempts and plans for globally addressing ecological damages environment across the world. It brings global warming under control. Dr Praveer Sinha has referred to this in his speech; there have been efforts to shift the use of renewable energy sources like solar energy. All these efforts have had been only limited impact. To demonstrate this how deep the rot is, one can look at pernicious plan instead of carbon credit system. This simply means countries on high energy consumption trends can offset the increase in carbonization to

purchase carbon credits or unutilized carbon footprints from poor underdeveloped countries. And permanently widen the chasm of energy in today in developed world and developing world, the rich from the poor.

Therefore in my view there is always danger of new technologies becoming in toxic forms. Socially inequalities across the world and the grim problems are continuing in rising in poverty are at the epicentre of the new world which you see around us. There is fundamental question of distributive justice in all forms of capitalism. Unfortunately, ladies gentlemen, capitalism is totally unredeemed by necessary compassion and care at the top is power structure of the society. It is totally true to say there is death of social idealism in the 20th century, and we are all seeing ugly faces of rising capitalism.

Across the world societies are tending to glorify the accumulation of wealth. There is mention in the recent OXFAM's Report that 2153 billionaires combined have more wealth than 4.6 billion of people on the planet. The emergence of billionaires and oligarchs in different parts of the world in different societies contrast with alarming images of impoverished millions. In this sense, economic development, as it is structured today is an oxymoron because it occurs demonstrably only the degradation of environment, and confrontational division of the society into the rich versus the poor.

So what is the solution? One possible way is to limit the economic growth in all nation states and ensuring progress in every state economic growth is tolerated only when all sections of society are benefitted. There is a practical working example to illustrate this point. There is Nordic economic model. Remarkable achievement in Scandinavian countries like Denmark Finland, Iceland, Sweden, and Norway. The total population in the Nordic countries is estimated to be 27 million people. The Nordic countries are amongst the riches countries in the world. These are the countries not even equivalent to richest countries in the world. These are countries where large public sector enterprises run transparently. Extensive and generous system as social safety nets all paid by government. High levels of taxing, particularly taxes on wealth, and citizens'

involvement in promoting and upholding welfare institutions. The UN Report importantly states that the Nordic countries are also the happiest countries in the world with Norway at the top in the latest assessments.

In contrast, applying the same yardstick United States stands 14th in the happiest countries in the world. Can you imagine the results of applying this yardstick to the nations in Africa and Asia? Everybody is aware of the need for achieving sustainability but unfortunately the mirage of progress lures all levels of the society to pursue relentlessly high density of energy as a formula for fast economic growth. There is another angle to the position. Scientist knows the first law of thermodynamics ensures that energy is a concern. But, as far as the third law is concerned—where does the entropy go? Recent scientific studies in cosmology have shown about 95% of that exists in this universe consists of dark energy and dark matter. The rest of 5% is observable in universe—is this dark matter and dark energy then the accumulated quantum of entropy is in the universe since the beginning can be harnessed. Realize the world at the point of apocalypse, collectively, especially the so-called the developed world, you can pull back egregious consumption of energy and move towards totally generating energy from sustainable sources such as solar power, wind power and the power from sea waves and so on. It could well mean massive change in the way we live but this change will take many forms, way better alternative for mass destruction and extinction of all species live in this world. World has very little time to pull back. Thank you.



# Darbari Seth Birth Centenary Special Address

**Mr G Narayana**

**Chairman Emeritus, Excel Industries Limited**

*Topic-Shri Darbari Seth: An Inspiring Leader for Success and Sustainability*



Honourable elders, good will to colleagues, loved youngsters, Shri Bhupender Yadav ji, the Honourable Minister, Mr Nitin Desai, Dr Praveer Sinha, Mr Krishna Kumar, and Ms Vibha ji, and Ms Shelly ji and also members of Mr Seth's family. I am very happy to be here to speak and remember Mr Darbari Seth, both as a leader and a person and a visionary. He

actually is not only an inspiring leader but had divine qualities. I have seen him personally and Bhagavad Gita says *abhyam sattva-samsuddhir jnana-yoga-vyavasthitih danam damas ca yajnas ca svadhyayas tapa arjavam*. And here I have taken only one slokam. There are other qualities, namely 27, but we will only talk about *abhyam*. He was a brave, fearless, he was like a lion. Problems inspired him. Challenges inspired him, India inspired him. And, especially energy situations inspired him. That time when energy crisis was there, he set an example in both organizations, Tata Chemicals and Excel, to demonstrate how we can preserve, conserve, reserve, and serve in energy situation. And that's why, even today, his spirit is present in TERI.

So, challenges used to inspire him. He was clean at heart and clean person. During my interaction with him one day he told me that about any person, the words you choose in public

should be the same words you can talk to him in private. Your private talk and public talk should not be different. That was the intrinsic value of his life. He was always following the knowledge and involved with *swadhaya*—means self-study—study on self, all his life, he carried out his studies on his own self. He went to America and shared his experiences with me. He worked on part-time basis in a library and studied all the subjects. Any subject whom he doesn't know he used to pick up that study. In 1975 there were some legal litigations that were going on. One day when I went to see him, I found there were lots of legal books lying on his table. I asked him why he has taken legal books, he replied that his lawyers inspired him to study laws and to understand the details of legal implications. He was always remained studious irrespective of his age. He used to learn more and then teaching those learning to others. Teaching is limited but learning is unlimited. So he was always a learner unlimitedly.

Next is *danam damasha*, he used to give as much as possible to others. And even Mr Krishna Kumar knows him as he often says—Mr Seth was a *dilwala*. He used to offer everything to others by his heart. He was never afraid for going anything to anyone. Whatever was requested by any voluntary organizations, he was on the fulfilling job. Many people know and even Tata Chemicals also know he never rejected anyone's request.

He had his own social organization such as Iklas Trust. He used to give as much as money, whatever he had to please people. And this principle of that person is fantastic. There was a hospital, Hedgewar Hospital and Ambedkar Institute in Aurangabad. They wanted to build a big hospital but this desire could not be materialized because there were no funds. So one person named Mogan Bhogle and another Dr Phandare, asked me if they could approach Mr Seth. I ensured them to go ahead. So they went and met him and made their presentation. In turn Mr Seth agreed to give them Rs. 96 lakh. It made a difference. Even Tata would have given one crore for this noble cause. So, Mr Seth was a man of ethics and values. He was upset when a person tried to offer more than the amount offered by him. He got upset and queried how that person could do so. The

other person said he will give one crore through advertisement. Mr Seth argued that it was wrong. Then that person came and met Mr Seth and apologized before him. That hospital is still serving now. Like this there were many instances. These kinds of contributions made a vast difference. He inspired people by his liberal contributions by making difference. He always preferred to give *danam*, liberal charity.

One day he asked me after one of the Board meetings, “let us not go to 5-star hotel, but go to a simple small hotel.” Then I suggested Panchavati Hotel. Panchavati was Udupi Restaurant of the excellent quality. Me, Mr Seth, and Mr Veeramani we all went there. The food we ordered was tasty and sambhar was exceptional. Mr Seth called that service boy and asked for more sambhar. However, the serving of extra food was limited. That server replied to Mr Seth, “Extra sambhar will be served on extra payment.” Mr Seth confirmed him, charges will be paid. After eating the food he asked that boy what will happen if he will not pay extra money, then. But that boy was magnanimous. He replied to Mr Seth he will adjust even if he doesn’t pay for the extra sambhar. In the end Mr Seth paid a tip of Rs. 300 and he appreciated that boy, it was big amount at that time. So for giving anything to anyone he never hesitated. He went to Pakistan to help in his village along with Shri Dilip Kumar, he went to help to those living in troubled areas. *Danam dharmam yagnasya*. He was of the view that giving alms in charity is a sacrifice.

And everyone who met with him was seen quite relieved. His entire life, he lived with the background of ethics.

Energy was very much dear to him. Ethics, Energy, Economy, Excellency, and Ecology, he combined all these five Es which I will explain now little bit in brief. He was such a kind-hearted that he agreed to give his shares to our employees. All employees of Excel Industries got shares and we have decided in the board meeting it should be at book value. So share price was some Rs900 whereas book value was nearly Rs. 60, market value was Rs. 900 and we have decided per share at Rs. 10. When he came to know that decision of Rs 10 as book value he asked us: whether we are following business ethics. He lamented that we

are taking share amount of employees. Therefore, we decided to be ethical to fix each share at the book value. He was annoyed over the decision of changing book value of Rs. 10 to Rs. 6. Even then employees were happy. And loan was given to employees whoever opted for it. So he took care of all employees and that is why employees sincerely worked with him. He demonstrated greater respect towards his employees.

He was always narrating moral stories to his employees including seniors like JRD Tata and other members and he had great respect for Nitish Shroff, Ritesh Shroff and KG Shroff who were senior employees and members of the board. There he used to inspire youngsters and young employees. He inspired Deepesh Shroff to open up a big salt manufacturing unit in 20000 acres of land and Deepesh emerged as a great leader inspired by Mr Seth. For me he inspired others to follow business ethics and it is one of the wonderful experiences to discuss.

He was highly inspired consciously by Sanskrit language and he used to speak to me about Sanskrit as he was not familiar with the language. I preached him *dharma* is the key element of business ethics. I wrote a book on *dharma* for his use. I explained to him what is meant by *dharma* and in what way one can follow the doctrine of *dharma*. He used to inspire his secretaries and other colleagues. For me Mr Seth was a wonderful person in all respects. His secretary once asked me: what is *dharma*? In simple terms, I said—dharma means dhar plus ma. To support mother is the key element in business ethics. To Mr Seth I told *dharma* is *Insaf* (justice). *Insaf* means inner cleanliness in talks and deeds. He was very happy on this interpretation. He was also interested to know and follow *dharma*, *karma* and ethical values of business.

I wrote a poem for Mr Seth in 1990. I elucidated some dialogues with God and calling upon people to talk with God as prayer. How? You ask question to God from yourself and answer yourself, God is not living somewhere but lives inside our self.

*īshvaraḥ sarva-bhūtānām hṛid-deśhe 'rjuna tiṣṭhati*

*bhrāmayan sarva-bhūtāni yantrārūḍhāni māyayā"*

*Bhagvad Gita Chapter 18, Verse 61*

Mr Seth came to know the real intrinsic meaning of word *dharma*, and prayers to God.

### CARING - SAMARTH

Man asked:

God! today I met Mr. Darbari Seth,  
charged and energetic was Mr. Seth.  
About country he has ever cared,  
to solve nations' problems he ever dared.  
He was concerned about the Petro-gap,  
he was concerned as if it is on his lap.  
He took the responsibility to do his best,  
he was confident that India can pass test.  
What makes Mr. Darbari Seth tick ?  
How he produces miracles like a trick ?  
What is the secret of his leadership ?  
What is the key to his stake holdership ?

God Replied:

Dear Man! DSS is very close to me,  
work is his worship, any one can see.  
Who worships work, he worships me,  
from that worship, energy gets he.  
For DSS always his country is first,  
country's problems he owns up first.  
Owning up is the responsibility ; way,  
by his example he shows the way.  
He is a "Samarth" and he sure "can do",  
in every "Samarth", I am present too.  
DSS doesn't take he ever gives,  
whoever gives in 'me' he ever lives.  
Miracles are tricks for whoever gives,  
because for him, everyone, dedication gives  
For country and people DSS cares,  
success, difficulties with them he shares.  
He built up the best company that cares,  
I am in company with whoever cares.  
Caring is secret of his leadership,  
daring is secret of his stakeholdership.  
DSS is example of a self-made man,  
with self-fulfilment he is divine man.

Once there was a crisis for energy and this became the starting point for TERI to set up an organization to do research and work exclusively for energy. There was a problem for petrol and this is beginning for the establishment of TERI. Besides this whenever any problem came on the way of country's development, Mr Seth always took it as his own problem. He took the responsibility to his best ability and he was confident that India can deal with the problem of energy crisis. He even proved Americans wrong and came up with the sustainable process mass production of caustic and other chemicals. He chalked out some strategies to produce caustic from Indian perspective and he got succeeded in this caustic production business. What are the keys to his leadership and what are the keys to his stakeholdership? We must introspect on these intrinsic elements. Work is worship, he used to worship people. He was truly devoted to Lord Hanuman. He even prepared the budget of his company and got tremendous success in his job.

He undertook many projects and completed those projects with faith in God. He was keen in taking up the problems of this country on him and used to solve them strategically. For any work his priority was to solve country's problems and then attending his company's work. For his employees he had shown his own ways how to solve many problems. He was *samarth*—competent person for solving any problem—be it of country or be it for his company. His doctrines are simple—take and take is federalism—take and give are at the core of the business ethics. He always received grievance and solved problems happily. He was doing with great sense of dedication by following essence of *Bhakti Yoga*. These are real qualities imbibed by Mr Seth followed in true spirit in action.

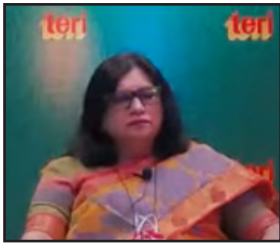
Now I would like to share with you one instance about sustaining. In other words sustaining, sustenance, sustaining success cannot be practical when tackling any problem. This sustaining is a complex term. This will help us in tackling energy crisis. Ethics, Energy Excellence, Economy and Ecology are the five values which were important for a company or a country. Ethics says use the energy within its limits and not excessively.

Ethics means not to use excessively, not to steal, keeping balanced usage is ethics. His clarion call is the use of energy within its guidelines and this is ethics in his dictionary. He was of the view that people should not do work normally but their efforts should be coupled with excellence, then only it becomes ethical. According to him we should ensure economy of prompt use of resources and then only economy will sustain. He advised people while using energy in the economy proper care should be exercised not to disturb ecology. He treated ethics and ecology are two covering pages of a book. In between these cover pages it is *drama of energy, excellence, and ecology*.

People should know the essence of economy, excellence, and ecology for which efficiency and effectiveness are required. These two qualities will come from purity and beauty which will give rise to wisdom. By using resources in excess gives rise to estrangement. Sustainability is the system balancing of sustaining, the proof is depicted in the scripts of mythology—The Mahabharata. Ethics is Yudhistir, Energy is Bheem, Excellence is Arjun, Economy is Nakul and Ecology is Sahdev (which means *pashupalan*). Effectiveness is Abhimanyu, Efficiency is Ghatotkach. Draupadi is Enlightening, Panduraj is Purity, and Beauty is Kunti. Ego is Duryodhan, Excess is Dushyasan and hundred desires are hundred brothers. Estrangement is Karna. So this is the secret codes of the Mahabharata which give full meaning of sustenance. So *dharma* can sustain you, ethics can sustain, energy can sustain. This is the instance that I wanted to share with you. PPT slides are available and you can see this presentation. And my Namaste (salutations) to all of you. Thank you.

# Vote of Thanks

## Dr Vibha Dhawan, Director-General, TERI



Thank you Sir, Honourable Union Minister Shri Bhupender Yadav ji, Dr Praveer Sinha, Shri Krishna Kumar ji, Shri Narayana, Mr Desai, members of Seth family, friends, colleagues and all of you who are assembled here to honour Mr Darbari Seth on his birth centenary—I thank you all for accepting our invitation and attending this year’s lecture. I also extend my gratitude to Sindhu and Sudha for facilitating the participation of Mr Krishna Kumar and Mr Narayana who were Mr Seth’s mentees. I would like to thank all my colleagues for working hard to make this event a memorable one for all of us.

On behalf of TERI, I want to particularly thank all the distinguished speakers for graciously accepting our invitation to speak at this joyous occasion. This year’s lecture is particularly special for us as we celebrate the 100th birth anniversary of our visionary founder Mr Darbari Seth. Our founder Director General Dr R K Pachauri, who was prodigy of Mr Seth and the one who started this lecture series to honour his mentor is no longer with us physically. But the guidance provided by our founder chairman and founder Director General Dr R K Pachauri will light our future. It would be appropriate to share the journey of TERI and of course some of it has already been shared by Dr Verma. Well, it was in 1974 that Mr Darbari Seth who was then the Vice Chairman of Tata Chemicals Limited (TCL) decided on this entity called TERI.

Mr Seth was deeply interested in energy issues, and as you all know that Tata Chemicals is located in a place called Meethapur, which is in northwest remote corner of India in Gujarat. And, it has established a process by which they were



producing caustic soda from sea water. This sea water is fried in large pans out in the open and so basically it is using solar energy in drying up the pans and creating salt. And that salt is used for producing soda ash, which incidentally involves a highly energy-intensive process. And given the fact that this is an area which is totally deficient in availability of fresh water, even for drinking purposes, they also had to use a large part of the energy for desalination purposes. So, this process of the TCL Plant was totally dependent on the intensive use of energy and, therefore, it became important to see how each single unit of energy could be used efficiently. And this was something that Mr Seth, as a brilliant engineer, appreciated and was able to implement in the psychology of TCL as an organization and design of its plant.

So, with his appreciation of energy, both at the micro and macro levels, he decided to set up Tata Energy Research Institute. He was supported by Mr JRD Tata, the chairman of Tata group and Mr Seth who was responsible for Tata Chemicals set aside something in the order of Rs. 3.5 crore, that was a huge amount at that time to establish TERI. So, that is how TERI started with Mr JRD Tata as the first chairman of the Governing Council and a corpus of Rs. 3.5 crore mainly as a fund giving organization for selecting proposals which were in this area of research. Then of course there was publication unit which was established in Mumbai and so on. So, that is the journey where we started.

I'll like to thank Mr Yadav, for your brilliant address on India's achievements in climate change and India's leadership in taking climate action under the dynamic leadership of our Prime Minister Shri Narendra Modi and other Cabinet colleagues, like yourself. It has been recognized by the world over through the global initiatives. Urgent action on slowing global warming is important as its devastating impact on both nature and human lives is already visible, including rising sea levels, extreme weather events like floods, droughts, and bush fires and they are spread all over the globe—whether it is the developed world or the developing world. It is quite unfortunate that we have been even losing our human lives in the process.

In fact, this year PM's address on August 15 reconfirmed that TERI's priorities are in line with the country's priorities. It

is something like mini India what it should be doing and TERI is doing in its own little way. As I have mentioned earlier, we have a rich legacy of Tata's and as an institute we have imbibed their value systems. We are so privileged to have speakers with common lineage of Tata's and thank you so much once again.

I want to thank Dr Praveer Sinha, for putting across the points on energy transition—the Way Forward for India. Tata Power is one of the leading stakeholders in the country's renewable energy transition. Through many of its initiatives, including withdrawal from building new world fire power plants. Thank you Dr Sinha for giving us your insights. I am sure my colleagues are feeling very proud of their heritage of forward thinking. As we celebrate the 100th birth anniversary of Mr Darbari Seth, I consider it our privilege to have two mentees of Mr Seth with us today who themselves are reflections of goodness which Mr Seth embodied.

Mr Krishna Kumar, your speech on energy and the mirage of progress serves as reminder for us taking respite in the false hope in the nature of development. Your words reminded us the importance of energy balance and harmful effects of waste generation, specifically the e-waste. Mr Narayana, thank you for your artistic and philosophical lecture on leadership, Shri Darbari Seth, an inspiring leader for success and sustainability. Your words will inspire all our colleagues. As you have mentioned, Mr Seth was a keen learner and it reminds me of my trips to Gual Pahari with him, which is about 35 km from our main office. I come from the field of biotechnology but one week before going with Mr Seth I started reading all about biotechnology because he will be talking to me what came in the press yesterday or may be yesterday night on internet. So, he will be talking to me all about it and you tell him something new and it was as if some sort of naughtiness in his eyes or that glow in his eyes that this is something you should be doing. And he will tell you something and if he would meet you even after a year he shall again ask you, "Have you done something on this particular thing?"

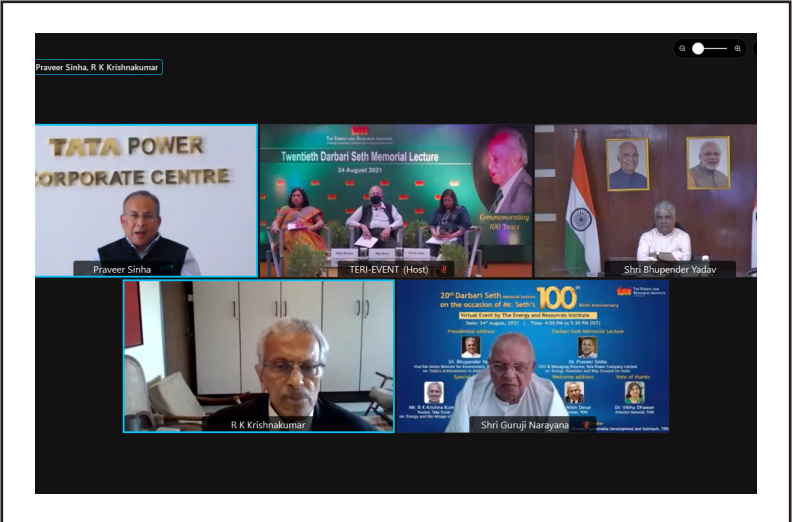
So, he was so inspiring and while you said he was a learner I would say he was great teacher as well. Because he shared many of his childhood incidents with us which in a way taught

us that never be a loser, you always have to emerge as a winner. He shared his childhood stories about how he was treated by his aunt and others and that helped him shaping up what he was.

I take this day as a day of thanksgiving because we are grateful to a large number of sponsors. Starting with Tata, I will say that the journey is very long and there are many sponsors who have continuously supported us financially as well as partnered in our research initiatives. We have had several contributions by a number of donors and I would like to put on record our appreciation and big thanks. Our founder Director General Dr R K Pachauri, former DG Dr Ajay Mathur and former TERI colleagues, they all have contributed to the growth of TERI.

All my dear colleagues I will say they are next to none; it is the human resource on which TERI is building. They are working passionately and very hard towards finding innovative solutions for energy generation, energy access, energy efficiency and have fully realized that this is the only way or key to India's future growth. My sincere thanks to all of you for your efforts, which are leading to sustainability. Your efforts in developing and adopting greener technologies leading to hunger-free planet are acknowledged globally. All this is possible due to the vision and initial financial support from Tata's and hard work by all of you. TERI has grown with the support, guidance, encouragement, and research freedom provided by Mr Seth's legacy, which is now being followed by our present chairman Dr Nitin Desai and along with TERI's members of Governing Council and it is my privilege to be a part of the efforts to take the legacy forward.

In the end, I would like to add that with the vision of innovative sustainability and continuous endeavour towards research in shaping leaders by providing them important insights about the environment. TERI strives to realize Mr Seth's dream and work towards making this planet greener and cleaner. Thank you once again for being with us and all those who are present physically in IHC I invite them for a cup of tea and we hope next year we will be free from this pandemic and we will be able to celebrate 101st birthday of Mr Seth in a much bigger way. Thank you once again.



## Dr Praveer Sinha

“ I think the way the clean and new technology can play a pivotal role in distributed generation and storage solutions along with electric mobility can enhance the pace at which we can reduce the climate change. ”

## Shri Bhupender Yadav

“ While I listed a number of Indian initiatives, actions and the achievements so far in the area of addressing climate change, these examples also highlight the need for a more responsive, multilateral approach in which all countries take their fair share of burden in responding to the global threat of climate change. ”