INDIA ENERGY FORUM

TOTAL ENERGY

Vol - 14 | Issue – IV

September - October 2019

Quest for Energy Security!!

FORUM Welcomes and Congratulates new Distinguished Sectoral Leaders

Shri Sanjeev Nandan Sahai, Secretary, Ministry of Power

Mr Sahai is a 1986-batch IAS officer of union territories (UT) cadre. Prior to this, he was serving as the special secretary in power ministry.

He has had the rare opportunity of having worked in the private sector, where he began his career as a member of the Tata Administrative Service, and then for seven years as Adviser, Infrastructure Development Finance Company (IDFC) and as MD &CEO of Delhi Integrated Multimodal Transit System Ltd (DIMTS), a joint venture company of IDFC and the Delhi Government.

Shri Anil Kumar Gautam, Director Finance, NTPC

Shri Anil Kumar Gautam joined NTPC in the year 1984. He has over 34 years of rich experience in various aspects of Finance & Accounts in Power Sector including resource mobilization from domestic and international markets, long-term financial planning, taxation, budgeting, investment appraisals, investors services and regulatory affairs.

Shri Rakesh Misri, Director Marketing, HPCL

Shri Rakesh Misri took over as Director-Marketing of HPCL on October 17, 2019. Prior to his appointment as Director-Marketing, Shri Misri was Executive Director-Marketing Coordination in HPCL.

A Gold Medalist in Civil Engineering from REC Srinagar (now NIT Srinagar), Shri Misri has a rich and varied professional exposure of over 36 years in HPCL. He has held various senior level positions in the organization heading the North Zone Retail, Executive Director-Direct Sales, Executive Director-Human Resources, Executive Director-Corporate Strategy & Business Development, and Executive Director-LPG.

Shri Anil Kapoor, Director HR, BHEL

Shri Anil Kapoor, 57, has assumed charge as Director (Human Resources) of the BHEL. Prior to this, he was heading the HR and Corporate Communication functions of BHEL as Executive Director, overseeing the entire gamut of HR processes encompassing transformational and core areas of HR.

Shri S M Vaidya, Director Refineries, Indian Oil

Shri Shrikant Madhav Vaidya has taken over as the Director (Refineries) of Indian Oil . He is also a Director on the board of Chennai Petroleum Corporation Ltd. (CPCL) & the 60 MMTPA West Coast Refinery and Petrochemicals Project, the world's largest grass root refinery project, coming up in Maharashtra.

Shri S. M. Choudhary, Director Finance, SECL

Shri S. M. Choudhary, a qualified Chartered Accountant, Cost and Management Accountant and Company Secretary with over 3 decades of experience in coal industry has taken charge as the Director (Finance) in South Eastern Coalfields Limited. Prior to taking charge at SECL, Shri. Choudhary was the Director (Finance) in Western Coalfields Limited since 3rd March, 2016.

From the Editor

Renewable Energy India Commited !

Despite, the doubts about India reaching its 2022 Renewable Energy target by many experts, Government's Commitment to the sector is quiet firm. In fact, the Prime Minister announced at the recently concluded United Nations Climate Summit that the target is being increased to 450 Gigawatt by 2030.

Francesco La Camera, Director General of the International Renewable Energy Agency, while releasing a report on "A Climate-Safe and Sustainable Energy System" at the Asia Clean Energy Summit said.

"The most important thing is the political will (of India)," he said highlighting the Indian Government's commitment to achieve its renewable energy targets as part of its stronger efforts to manage climate change. Camera also expressed satisfaction with the cost of renewables coming down. The USD cost of solar PV in India has come down by 79 per cent per kilowatt hour and 24 per cent for onshore wind in 2018 from 2010, according to the IRENA report. Likewise, the onshore wind and solar PV cost in China was also down by 32 per cent and 77 per cent in 2018 from 2010 and down by 9 per cent and 71 per cent for onshore wind and solar PV in other parts of Asia. India is likely to install more wind capacity in 2019 than it did last year, but it will still be well below what it used to be earlier. According to Bloomberg New Energy Finance, the country will install 2.9GW in 2019 against 2.3GW in 2018. In 2016-17, 5.4GW was added, while 3.4GW was achieved in 2015-16.

"We expect 15.6GW of new wind projects to be added between 2019-22. Thus, India will reach 51GW of wind installed capacity by 2022, 9GW less than the target of adding 60GW of onshore wind projects by 2022," said Atin Jain, associate at Bloomberg New Energy Finance (BNEF).

Sectoral News

India's generation capacity will have to increase up to seven times the present figure to meet our growth needs. The major part of our energy mix consists of fossil fuels. They are finite sources and have serious environmental consequences. In times of depleting resources and climate threats, the best way forward for India is to take the dual path of energy efficiency and renewable power generation like wind and solar. It is imperative to tap into these huge renewable power sources and judiciously utilize the non-renewable resources, keeping energy conservation in mind.

To achieve this, the renewable energy programme India is investing in supporting mechanisms that strengthen the call for clean and renewable energy policies through advocacy and awareness building and creating a supportive renewable energy implementation environment.

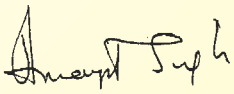
A study by the World Resource Institutes concludes that a large-scale adoption of electric mobility will spur renewable energy growth

An increase in the number of electric vehicles (EVs) will be instrumental in increasing the share of solar and wind energy in the energy mix, considering renewable energy sources are only intermittently available and are weather dependent.

It further added that grid operators can store renewable energy in batteries and supply it back to the grid in case of unstable power supply.

According to the census findings, decentralised renewables are a significant employer. Relative to its penetration level in the market, the DRE sector has already grown an impressive direct employee base. The India census results show that formal workforce is already equivalent to the on-grid solar industry, and may double in size between 2017-18 and 2022-23 if the mini-grid market continues to expand at a rapid pace.

The commitment is to make India No.1 Renewable Energy consumer. Challanges are enormous but political will is firm.



Amarjit Singh

Double India's Non-Fossil Fuel Target to 450 GW

While addressing UN Climate Action Summit, Prime Minister Narendra Modi asserted that the time for talking is over challenge. The world needs to act now on climate change issues.

"The respect for nature, the judicious use of resources, reducing our needs and living within our means have all been important aspects of both our traditions and present day efforts. Need not Greed has been our guiding principle," Modi said, adding "I am happy to announce that tomorrow we are going to inaugurate solar panels on the roof of the UN building, funded by India at a cost of 1 million dollars."

"We must accept that if we have to overcome such serious challenge, then what we are doing today is not enough. What we need is global behavioural change," he said. "India is here today not just to talk about this serious issue but to present a roadmap. In India, we are going to increase renewable energy capacity," PM Modi added. Eighty countries have joined India's solar alliance imitative, he further informed.

"India is launching a coalition for disaster resilient infrastructure. I invite all world leaders for this coalition," the Prime Minister said, adding, "We are encouraging e-mobility in our transport sector. We have given gas connection to 150 families. We have also started Jal Jeevan mission for rainwater harvesting."

The PM announced that India is going to increase the share of non fossil fuel, and by 2022 the country plans to increase renewable energy capacity to much beyond 175 GW, and later till 450 GW. India is also working to considerably increase the proportion of the biofuel blend in petrol and diesel, he added.

The PM also referred to the Jal Jeevan mission for water conservation, rainwater harvesting and for the development of water resources. India is going to spend approximately 50 billion dollars on this in the next few years.

"I thank UN Secretary-General for organising the Global Action Summit. Various efforts are being made to fight climate change. What is needed today is everything from education, values to lifestyle and behavioural change."

"…We must accept that if we have to overcome such serious challenge, then we are doing today is not enough, we are having a comprehensive approach from education lifestyle we need is global behavioral change."

India and Sweden together with other partners are launching the Leadership group within the Industry transition track. "This initiative will provide a platform for Governments and the private sector with opportunities for cooperation in the area of Technology innovation. This will help to develop low carbon pathways for industry," according to the PM.

Can India Become Solar Power Battery Hub?

Prime Minister Shri Narendra Modi

Amid his thrust on renewable energy, Prime Minister Mr. Narendra Modi recently wondered whether India could become a hub of solar power battery manufacturing, which can play a major role in the march towards clean energy.

He stated this while giving example of mobile phones, saying their popularity increased manifold as the size of their batteries decreased.

Mr. Modi was responding when asked for his comments on the global challenge of climate change after he addressed the Eastern Economic Forum (EEF) here in presence of Russian President Vladimir Putin, Japanese Prime Minister Shinzo Abe, Malaysian Prime Minister Mahathir Mohamed and Mongolian President Kjhaltmaagin Battulga.

He said India, as part of its aspiration to generate 175 GW of clean energy by 2022, is focusing on solar power in a big way.

Expressing confidence that India will achieve the target of 175 GW of renewable energy, the Prime Minister wondered whether India could become a hub of solar power battery manufacturing.

He said he has invited companies dealing in it to discuss the matter.

He said if solar power was used for cooking in the country, there was scope for 250 million batteries, which in turn could benefit the electric vehicle market through cross-subsidy.

Ocean Energy

With the Ministry of New and Renewable Energy (MNRE) recently including all forms of ocean energy into the ambit of 'renewable energy' for satisfaction of renewable purchase obligations of the discoms, the immense potential of India's untapped 7,500 km coastline is up for taking. Official estimates of potential in tidal energy stand at 12,455 megawatt (MW) whereas other forms of energy such as wave energy provides for additional capacity. It is also notable that MNRE has not restricted the technologies that can be deployed for realising the potential of ocean energy and all forms of ocean energy have been included. Given the pace of advent in technology this appears to be highly prudent step for an economy which is looking for more efficient solutions to the ever-growing energy needs.

However, the challenges in harnessing any form of ocean energy still remain. Although, India had shown its inclination towards tidal energy as far back as 2011 when the 50 MW tidal energy plant was conceptualised in Gujarat, the actual implementation remains elusive. The lack of policy support and the Government intention has till date failed to provide any substantial interest in the sector. Even globally, tidal energy plants are limited with only 500 MW capacity in operation, and with South Korea leading the actual and planned investments.

Before India can expect industry involvement in the sector, certain challenges are required to be addressed. Environmental impact will remain the biggest hurdle in implementation of any such projects. Given that tidal movements impact both the coastal environment and marine life, any disturbance created by barrages for energy generation may have to be examined in detail by the relevant bodies. South Korea's example in this case may be worthwhile, where the policy initiative for ocean energy has been taken up by the ministry of oceans and fisheries which has jurisdiction on the coastal rules as well. Although, MNRE has issued the notification, unless there is sufficient integration with the rules formulated by the Ministry of Environment, Forest and Climate Change (MoEF), it may not prove much of a support to the sector for the full exploitation of the potential.

Despite the challenges ocean energy will face, the future does look bright with various technologies in advance stages of commercialisation. Innovators are now focusing on integrating various technologies to harness multiple forms of energy (such as waves, tides, and ocean currents) with the same set of equipment. Needless to state that MNRE notification may be the first step towards exploring the immense potential of India's coastline, but with more determined efforts the day may not be far when substantial share of India's generation capabilities may come for offshore plants.

India may Miss Renewable Energy Target

CRISIL

CRISIL
An S&P Global Company

Faced by many a regulatory challenge, policy flip-flops and also a steep fall in tariffs, the country is likely to miss the renewable energy target of 175 GW by 2022 by a wide margin, says a report.

According to a weekend report by CRISIL NSE - 0.87 %, this target is set to be missed by a full 42 per cent as the industry has been witnessing fast waning interest from developers since the past fiscal. "Renewable energy capacity may increase by just 40 gw to 104 gw in 2022 from 64.4 gw in 2019, thanks to

the lingering policy uncertainty and tariff glitches. That would be a good 42 per cent short of the Government target of 175 gw," the agency says in the note.

The report notes that as much as 26 per cent of the 64 gw of projects auctioned by the Centre and the states have received no or lukewarm bids, while another 31 percent are facing delays in allocation after being tendered. Thus, despite the increase in tendering volume, not only has allocation of projects slowed down, but both under subscriptions and cancellations of awarded tenders have also increased, says the agency.

As per the report, the ratio of auctioned or awarded projects to tendered projects plunged to 34 in fiscal 2019 from 77 over fiscals 2016 and 2017. "The unstable policy environment poses big risks for the renewable energy targets. This is evident in the growing incoherence between the policy thrust on the one hand, and the actual action by implementation agencies like the Solar Corpor Corporation of India and state discoms, on the other," it says.

The ongoing issue of tariff renegotiation in Andhra has also acted as a deterrent for most developers. As of July 2019, the Andhra discoms alone owed Rs 2,600 crore to developers, part of which was due to ongoing tariff dispute and the resultant delays in payments. Such prolonged payment delays and disputes not only set a negative precedent, but also put at risk existing and planned investments, the agency warns.

Similarly, Rajasthan's new draft solar and hybrid policy proposes an additional annual levy of Rs 2.5-5 lakh per mw on all projects that sell power to entities outside the state. "Should this be implemented, it could be highly detrimental for the growth the sector given that Rajasthan is one of the most sought-after states for solar power plants," it warns.

Besides this, tariff caps is becoming a new challenge for developers to navigate. "Developers are also increasingly losing interest as central and state discoms are increasingly lowering tariff caps, which is constraining project viability and resulting in renegotiation of tenders, where counter-parties disagree on pricing," it notes.

Solar Power Facing Slowdown

ICRA

India's solar and wind energy sector is facing headwinds and the liquidity profile of the IPPS in the segment is gradually deteriorating, rating agency ICRA said in a note today, adding it has revised the outlook for almost one-third of the portfolio.

"The industry segment is facing significant other headwinds in the near-term which has impacted investor sentiments. The overall tendering of solar PV projects has slowed down with the solar capacity addition in six months of FY2020 remaining subdued at 2.9 Gigawatt (GW)," ICRA said.

It added that the solar capacity slowdown has begun and has continued over the past 12-15 months, reflecting in FY2019 capacity addition which was 6.5 GW compared to 9.4 GW in FY2018. On a calendar year (CY) basis, the overall tendering action is lower by 28 per cent in nine months of CY2019 to about 7 GW on Y-o-Y basis with many bids remaining under-subscribed.

"As per CEA data, payment dues to renewable players stood at Rs 97 billion as on July 31, 2019 with almost 67 per cent of it being contributed by utilities in three states - Andhra Pradesh, Tamil Nadu and Telangana. Such payment delays along with uncertainty over resolution of tariff issue for projects and instances of grid curtailments have adversely affected the credit profile of the wind and solar power projects having PPAs with these state discoms," said Girishkumar Kadam, Vice President - Corporate ratings, ICRA.

The industry has been affected by a mix of factors including continuing delays in payments from utilities in states like Andhra Pradesh, Telangana & Tamil Nadu; regulatory uncertainty on tariff matters for IPPs in Andhra Pradesh and delays in tariff adoption by SERC in Andhra Pradesh; execution delays witnessed for land acquisition and transmission connectivity approvals and; tight financing environment over the last 8-10 months period.

"As a result, the ability to achieve the financial closure for the projects in a timely manner remains a challenge

for many of the IPPs. As opposed to this, the industry segment had a decent capacity addition in FY2018, supported by relatively sizeable capacity addition in open access segment due to favorable state solar policies in Karnataka," he note said.

In order to tide over payment issues, the IPPs are currently meeting obligations through a mix of available or enhanced working capital facility and debt service reserve account (DSRA) apart from the incremental funding support from their respective promoter entities.

However, IPPs with large exposure to the discoms in Andhra Pradesh and Telangana and especially, belonging to the promoter groups having relatively modest financial strength remain vulnerable from debt servicing perspective.

Given the execution challenges for IPPs in utility scale as well as the limited share of capacity addition in the roof-top and open access segment, the agency expects the overall solar energy capacity addition in FY2020 to remain at around 6.5-7 GW.

Global corporate funding in the solar power sector jumped 34 per cent to $9 billion in the first nine months of 2019, according to clean energy consulting firm Mercom. In the third quarter ended September, solar funding more than doubled to $3 billion from $1.3 billion in the same quarter last year.

Forego Free Power

To Make Hydro Projects Viable

Shri RK Singh

The Centre is persuading state Governments to forego their share of free power from hydroelectric plants to make the projects viable and put the hydropower sector on track. It proposes to hold a formal interaction on the issue with state Governments at the ensuing review meeting in Gujarat between Union power Minister RK Singh and power Ministers of states.

India is targeting production of 75,000 MW of hydropower by 2030, up from 45,000 MW at present, to balance the electricity grid as the country aims to add 175 GW of renewable capacity.

A senior Government official said the states are being held asked to forego or defer their free power shares only to the extent required to make the tariffs affordable.

"We are trying to convey to the state Governments that the projects can be economically viable when the free power requirement is waived or deferred to later years," said the Government official, who did not wish to be identified.

"It is otherwise very difficult to bring down the tariffs of the projects… we don't want our PSUs (public sector units) to be saddled with bad assets."

The power ministry has been emphasising on taking up only hydropower projects which are commercially viable, said the official.

The ministry has been urging state Governments to play their part in making hydropower competitive by foregoing, deferring or staggering free power and, if need be, their share of goods and services tax (GST), he said.

Long gestation period, geological surprises, local agitation, lack of clearances and inadequate infrastructure are some of the factors that have led to delays in implementing hydropower plants, rising project costs and tariffs.

The Government had approved measures in March to promote hydroelectric projects, including treating them as renewable projects and increasing debt repayment period to 18 years from 12 years to reduce tariffs in initial years.

Distributed Renewable Energy

A Job Creator

The distributed renewable energy sector is set to create 400,000 jobs in India by 2023, including 190,000 direct, formal jobs, almost double the current number, as well as 210,000 direct, informal jobs, according to the first annual jobs census measuring employment from decentralised renewables for rural electrification

released today by industry body Power for All.

The "Powering Jobs Census 2019: The Energy Access Workforce" aims to spotlight the energy skills and jobs needed to achieve Sustainable Development Goal (SDG) 7 – access to affordable, reliable, sustainable and modern energy for all.

The census provides comprehensive data on energy access jobs created by decentralised renewable energy including solar for home and business, green mini-grids and productive use systems such as solar water pumps. The India census received responses from 37 companies in India across the sector including many major companies representing a large market share.

"Access to electricity means access to jobs. The powering Jobs census offers strong evidence of the important link between energy access and employment in countries where rural joblessness is at record highs," said Power for All Chief Research Officer and census lead researcher Rebekah Shirley.

According to the census findings, decentralised renewables are a significant employer. Relative to its penetration level in the market, the DRE sector has already grown an impressive direct employee base. The India census results show that the country's DRE direct, formal workforce is already equivalent to the on-grid solar industry, and may double in size between 2017-18 and 2022-23 if the mini-grid market continues to expand at a rapid pace.

Asia to become Wind Energy Leader

IRENA

Asia could grow its share of installed capacity for onshore wind energy from 230 Gigawatt (GW) in 2018 to over 2,600 GW by 2050, a new report by the International Renewable Energy Agency (IRENA) said recently.

By that time, the region would become a global leader in wind, accounting for more than 50 per cent of all onshore and over 60 per cent of all offshore wind capacity installed globally.

China would take the lead with 2,525 GW of installed onshore and offshore wind capacity by 2050 within Asia, followed by India (443 GW), Korea (78 GW) and South-East Asia (16 GW).

According to the "Future of Wind" published at China Wind Power in Beijing, global wind power could rise ten-fold reaching over 6,000 GW by 2050.

By mid-century, wind could cover one-third of global power needs and -- combined with electrification -- deliver a quarter of the energy-related carbon emission reductions needed to meet the Paris climate targets.

To reach this objective, onshore and offshore wind capacity will need to increase four-fold and ten-fold respectively every year compared to today.

"With renewables, it's possible to achieve a climate-safe future," said IRENA's Director-General Francesco La Camera.

"Low-cost renewable energy technologies like wind power are readily-available today, representing the most effective and immediate solution for reducing carbon emissions.

"Our roadmap for a global energy transformation to 2050 shows that it is technically and economically feasible to ensure a climate-safe, sustainable energy future. Unlocking global wind energy potential will be particularly important. In fact, wind energy could be the largest single source of power generation by mid-century under this path. This would not only enable us to meet climate goals, but it would also boost economic growth and create jobs, thereby accelerating sustainable development," added Camera.

Renewable Power will Grow 50% in next 5 years, IEA

Global renewable energy capacity is set to rise by 50 per cent in five years, driven by solar photovoltaic (PV) installations on homes, buildings and industry,

according to the International Energy Agency (IEA).

Total renewable-based power capacity will rise by 1.2 terawatts (TW) by 2024 from 2.5 TW last year, equivalent to the total installed current power capacity of the United States.

Solar PV will account for nearly 60 per cent of this growth and onshore wind 25 per cent, the IEA's annual report on global renewables showed.

The share of renewables in power generation is expected to rise to 30 per cent in 2024 from 26 per cent today.

Falling technology costs and more effective Government policies have helped to drive the higher forecasts for renewable capacity deployment since last year's report, the IEA said.

"Renewables are already the world's second largest source of electricity, but their deployment still needs to accelerate if we are to achieve long-term climate, air quality and energy access goals," said Fatih Birol, the IEA's executive director.

"As costs continue to fall, we have a growing incentive to ramp up the deployment of solar PV," he added.

The cost of generating electricity from distributed solar PV (PV systems on homes, commercial buildings and industry) is already below retail electricity prices in most countries.

Solar PV generation costs are expected to decline a further 15 per cent to 35 per cent by 2024, making the technology more attractive for adoption, the IEA said.

However, policy and tariff reforms are needed to ensure solar PV growth is sustainable and avoid disruption to electricity markets and higher energy costs, the report said.

New Rooftop Solar Guidelines

The Ministry of New and Renewable Energy (MNRE) has issued operational guidelines to implement the second phase of its grid-connected rooftop solar photovoltaic (PV) program. Overall, 22 GW of rooftop solar PV projects is to be set up under the second phase of this program.

The target of the program is to install 38 GW of rooftop solar by 2022, of which 4 GW will be in the residential sector and 34 GW under other sectors such as Governments, commercial, industrial, and educational. The program also aims to promote domestic manufacturing of solar cells and modules.

There are two main components in the program:

Under Component A, up to 4,000 MW of grid-connected rooftop solar projects in the residential sector will be set up with Central Financial Assistance (CFA) for which DISCOMs and its local offices will be the nodal points for the implementation of the program.

A CFA of up to 40% will be given for rooftop solar PV systems up to 3 kW capacity. For rooftop solar PV systems of capacity above 3 kW and up to 10 kW, a CFA of 40% will be applicable only for the first 3 kW capacity and for capacity above 3 kW, the CFA will be limited to 20%.

For group housing societies and residential welfare associations under component A, the CFA will be limited to 20% for the installation of the rooftop solar PV project for the supply of power to common facilities. The capacity eligible for the CFA will be limited to 10 kW per house with the total not more than 500 kW, inclusive of rooftop solar PV project already installed on the individual houses.

The MNRE will allocate the capacity for the installation of rooftop solar PV systems in the sector by DISCOMs in the ensuing year. One of the parameters for allocating the capacity will be the demand raised by the DISCOM and the capacity required for the fulfilment of solar renewable purchase obligations (RPO) of the state. DISCOMs will be required to submit their yearly online proposal on the MNRE's SPIN portal by the month of March.

The Government-owned DISCOMs will be eligible to avail an advance CFA of up to 30% of the total CFA amount for the project. For private DISCOMs, the CFA will be disbursed on a reimbursement basis.

However, if required, private DISCOMS will be eligible to avail an advance CFA upon the submission of a bank guarantee of an equivalent amount.

Under Component B, incentives to electricity distribution companies (DISCOMs) based on their achievement towards the initial 18,000 MW of grid-connected rooftop solar PV projects will be provided. Incentives will be provided for each MW capacity of solar rooftop, added by DISCOMs in their distribution area over and above 10% of base capacity installed at the end of the previous year.

DISCOMs have to submit the cumulative capacity of grid-connected rooftop solar PV projects (in MW) installed in their distribution area as on March 31, 2019. This will be taken as the installed base capacity for the first year of participating DISCOMs. For achievement above 10% and up to 15% over the installed base capacity, the DISCOM will get an incentive of 5% of the applicable cost for the capacity achieved above 10% of the installed base capacity. For an achievement beyond 15% over the installed base capacity, the DISCOM will get 5% of the applicable cost for the capacity achieved plus 10% of the applicable cost for capacity achieved beyond 15% of the installed base capacity.

In March 2019, President of India had approved the launch of the second phase of grid-connected rooftop solar PV program in India. The program aimed to achieve the target of 40 GW of rooftop solar PV capacity by 2022. Under phase-II, 38 GW of grid-connected rooftop solar PV capacity was expected to be installed. The Central Government had to provide Rs. 118.14 billion (~$1.66 billion) as central financial assistance (CFA) for capacity building, service charges, and incentives to distribution companies (DISCOMs).

Participation of Dr. (Mrs) Malti Goel, Convener, Renewable Energy and Environment Group, India Energy Forum in EACCO2CU Conference & Workshop held in Malaysia on 6-8th August, 2019

First Euro-Asia Conference on CO2 Capture and Utilization (EACCO2CU) was held in Malaysia on August 6-8, 2019. The Conference was hosted by the Sunway University, a leading University ranked among top 2% Universities in Asia. Dr. (Mrs) Malti Goel, Convener Renewable Energy Group, India Energy Forum and Former Senior Adviser, Department of Science & Technology, was invited to conduct the Workshop. She delivered the plenary talk to discuss the role of carbon capture and utilization (CCU) in climate change mitigation. Expounding on the genesis of anthropogenic climate change and peoples' perception to CCU, she drew attention to the issues and challenges. The competing roles of CCU in addressing terra ton challenge of climate change and of resource conservation by converting CO2 into petrochemicals as value added products; were described.

EACCO2CU Conference Dinner and Cultural Evening

India to Spend $100 Billion on Energy Infra, says PM Inviting Saudi Investment

India will invest a massive $100 billion in oil and gas infrastructure to meet energy needs of an economy that is being targeted to nearly double in five years, Prime Minister Mr. Narendra Modi said recently as he sought investment from oil kingpin Saudi Arabia and other nations to boost supplies.

Speaking at Saudi Arabia's annual investment forum, also known as 'Davos in the desert', Mr. Modi promised stable, predictable and transparent policy regime to catalyse foreign investments.

"India is investing heavily in oil ad gas infrastructure," he said adding as much as $100 billion will be spent by 2024 in creating additional oil refining capacity, laying new pipelines and building gas import terminals.

The world's third-largest energy consumer is 83 per cent dependent on imports to meet its oil needs and about half of its gas needs are shipped from abroad. Its per capita energy consumption is a fraction of the global average and it is now investing heavily in physical infrastructure as well as city distribution to boost availability in a growing economy.

Saudi Arabia is India's second-largest supplier of crude oil and New Delhi is keen to expand this partnership beyond the buyer-seller relationship into a strategic one with cross investments.

Mr. Modi highlighted the recent opening of the fuel retailing sector for non-oil companies to lure investment in the world's fastest-growing consumption centre.

"India needs investments in the energy sector to meet the demand of a fast-expanding economy. And I request energy companies present here to take advantage of this opportunity," he said.

Mr. Modi said Saudi national oil company Aramco has decided to invest in the 60 million tonnes a year West Coast refinery project in Maharashtra - which will be Asia's biggest refinery.

Aramco, whose planned initial public offering is touted to be as big as the size of the Indian economy, too is keen to venture into fuel retailing and the petrochemical sector so as to lock-in consumer for its oil in a world that is fast-moving towards renewable energy sources and electric vehicles.

"I want to ensure you that India's rate of growth is going to rise further. We are taking steps for the growth of our economy," he said. "We are improving on our ease of doing business ranking. Due to political stability, predictable policy, and big diverse market, your investment in India will be most profitable."

Stating that infrastructure is a technology multiplier, he said it not only provides investment opportunity but it also important for the growth of the business.

"The requirement of physical infrastructure is in developing countries. Asia requires $700 billion per year for infrastructure development. We have set an investment target of spending $1.5 trillion on infrastructure development in the next few years," he said.

The Prime Minister said India is targeting to nearly double the size of its economy to $5 trillion in the next five years. "Roadmap for reaching the $5 trillion economy target is ready. The target is not only about quantitative growth but also about improving the quality of life of every Indian."

He said five big trends impacting global businesses are technology and innovation, infrastructure, human resources, compassion for the environment and business-friendly governance.

Transformative technologies such as Artifical

Intelligence, Genetics, and nano-technology have become part of daily life, he said adding India has become the world's third-largest startup ecosystem.

Stating that infrastructure is an opportunity multiplier, he said infrastructure is needed for the business to grow.

India, he said, is adopted an integrated approach for infrastructure development. "India is integrating infrastructure through one nation one power grid, one nation one gas grid and one water grid, one nation one mobility card, one nation one optical fibre network."

Infrastructure growth in India will be in double-digit and there is no possibility of capacity saturation.

For international investment depends on quality manpower and so skilling of human resources is essential, he said, adding 400 million people will be skilled in different streams in 3-4 years.

"International trade agreements should not be restricted to goods alone. Manpower and talent mobility should be an integral part of it," he said.

Rs 5 Lakh Crore Fresh Investment in Natural Gas

Shri Dharmendra Pradhan

India's Oil Minister Mr. Dharmendra Pradhan recently said domestic companies are looking at fresh investments worth a mammoth Rs 5 lakh crore in the natural gas sector.

Mr. Pradhan, who was speaking at 'Davos in the desert' on the commencement of work on projects under the tenth City Gas Distribution round, called for healthy competition between CNG and Electric Vehicles (EVs) highlighting that while EVs will come in due course CNG has already become a reality in India.

"We have already set-up more than 1,700 CNG stations, almost double the 2014 levels. We are now targeting to set-up 10,000 CNG vehicles in a few years. Energy consumption will increase. It will sourced through various sources. While coal will remain, it will be cleaner as coal-based gasification plants are also being set-up in the country," the Minister said.

He added renewable energy capacity will witness a huge growth and innovation will not be restricted around lithium ion batteries alone. Mr. Pradhan emphasized that investments in the gas sector have outstripped investments in oil sector, both globally and in India, and hydrogen will be a "big play" while natural gas will be used more to produce electricity.

"When we (NDA Government) took over, we used to import 7 MTPA gas from Qatar under a term-contract and used to pick up another 1 MTPA from spot contracts. Now, after renegotiation, we are importing 8 MTPA of LNG from Qatar, 5.8 MTPA from USA, 2.5 MTPA from Russia and 1.44 MTPA from Australia. Term-contracts now are as high as 18-20 MTPA per year," the Minister said.

He also added that India's LNG-re-gasification capacity is on its way to reach 52 MTPA in some time from the current 38.8 MTPA and LNG terminals will be set-up on the east coast soon. The Government is working to create a natural gas grid and over 14,000 Km of additional gas pipeline infrastructure is being created.

Mr. Pradhan also said India will be a world leader in EVs. "We are doing frontier work in EV mobility solutions. Let no one be under the impression that we will end up heavily relying on lithium as we do now for oil. Our oil companies' laboratories are working on cutting edge technologies. We have already introduced Hydrogen infused CNG in Delhi," he said.

Mr. Shashi Shanker Honoured

Oil and Natural Gas Corporation (ONGC) Chairman and Managing Director (CMD), Mr. Shashi Shanker was honoured with the Distinguished Fellowship of the Institute of Directors (IOD), 2019 during the 29th Institute of Directors (IOD) Annual Day Ceremony.

The honour was bestowed to Mr. Shanker by Mr. Hardeep Singh Puri, Minister of Housing and Urban Affairs, Civil Aviation and Trade and Commerce.

Asia's First Cross-Border Oil Pipeline Launched

Prime Minister Mr. Narendra Modi and his Nepal counterpart Mr. K P Sharma Oli recently jointly inaugurated the Motihari-Amlekhganj petroleum product pipeline via a video link.

The over 60 km-long pipeline is the first-ever cross-border petroleum product pipeline in the South Asia region, according to a video presentation made before the inauguration.

As of now, tankers carry petroleum products from India to Nepal as part of an arrangement which is in place since 1973.

"This India-Nepal energy cooperation project is a symbol of our close bilateral relations. It will help to enhance the energy security of the region and substantially cut down on transit costs," the Prime Minister's Office had said recently.

Cabinet Nod to Gas Exchange

Sources in the Petroleum and Natural Gas Regulatory Board (PNGRB) told a news agency that draft regulations on gas exchanges has already been finalised.

Gas transportation public sector undertaking (GAIL) and upstream oil company ONGC were expected to float a joint venture special purpose vehicle (SPV) to set up the country's first gas exchange. While the two could still go ahead with the plan, ONGC will have to take majority stake in the venture or the SPV would have to rope in more investors.

According to sources, the proposed gas trading hub will come up in the country early next year (first quarter of FY21) as PNGRB would take at least six to eight months to finalise regulations. Rating agency Crisil has been appointed to assist the regulator and the Government in framing rules for the exchange.

The End of Market Exclusivity

Mr. D K Sarraf

Petroleum and Natural Gas and Regulatory Board (PNGRB), the country's downstream regulator after concluding the mammoth 9th and 10th round of City Gas Distribution bids is now busy nurturing investors and streamlining the natural gas infrastructure and framework in the country, the regulator's Chief Mr. D K Sarraf said in an interview. Edited Excerpts...

The regulator has published a concept paper on determination of transportation rate for CGD network and for CNG.

City Gas Distribution entities are given marketing exclusivity for a certain period from the date of authorisation. This means that no one other than the authorised entity can carry out the CGD business in the area for which it has been given authorisation. This exclusivity is required to enable the CGD entity

to create infrastructure and then recover a part of the cost of the infrastructure from the business before he faces competition in his area. PNGRB does not have the legal mandate to regulate the price of gas. Despite this, consumer interest, to an extent, is taken care of as the gas generally competes with other petroleum productions e.g. Petrol and diesel for transport, LPG for cooking fuel and Fuel Oil and Petcoke for industrial fuel. However, to fully protect the interest of consumers, it is necessary to enable competition after the end of the exclusivity period, as also provided under the law. PNGRB has initiated the process of drafting the regulation for declaration of end of exclusivity after considering the views of the stakeholders. We are open to suggestions. That is why we have floated a consultation paper. A lot of work is required to be done on this.

Global Oil Majors are Looking at India

Shri Dharmendra Pradhan

Riding on the success of the Pradhan Mantri Ujjwala Yojana (PMUY), Minister for Petroleum & Natural Gas and Steel, Mr. Dharmendra Pradhan, has chalked out an aggressive target for himself in the upstream (exploration and production of hydrocarbons) and mid-stream (pipeline infrastructure) segments of the oil and gas industry. While the proposed strategic sale of Bharat Petroleum Corporation under his Ministry is in the news, Mr. Pradhan, in an interview with Business Line, made it clear that his role is that of a facilitator.. He is confident that through the successfully completed bidding rounds in the upstream segment, the energy sector will garner $58-billion investments by 2023 and an investment of about $60 billion in building gas pipelines, terminals and city gas infrastructure that are in different stages of implementation. Excerpts:

After Petronet LNG signed a non-binding MoU with Tellurian Inc at Houston, USA, there are other big outcomes of the Prime Minister's interaction with the CEOs there and the Howdy Modi event In the last five years we have been constantly persuading Exxon and other such big companies to come to our market. Now they are convinced. Exxon, for example, has entered into two MoUs — one each with Indian Oil Corporation and ONGC.

Exxon is one of the pioneers in LNG business in the world. It is interested in exploring the same in India and has signed a non-binding MoU with Indian Oil to initiate discussions. Simultaneously, it has engaged with ONGC to explore the possibility of exploration and production industry in India.

At CERAWeek, Bob Dudley, Group Chief Executive, BP plc, said there is plenty of resources available in India — close to 100 trillion cubic feet of natural gas resources — and that BP is here to stay for a longer period of time. That is the confidence the global companies have now.

Starting from small companies to oil majors all have realised that this is the time to look at India. There is a demand in India and the next two-three decades highest growth will be here. Besides, the recent reduction in corporate tax will also enthuse them.

We cannot be in isolation in world affairs. Domestic interest is paramount to us and when the Prime Minister talks about energy justice then affordability is the key factor. Nowhere we are purchasing the commodity at high prices, we are purchasing from anybody and anywhere in a very competitive and transparent way.

With the Exxons of the world looking at India how do you think the future prospects will be?

The earlier data we had was based on old repository and seemed to be very conservative. Now two things

have happened. First, in the last three-four years we have given much emphasis on data management. We have developed the National Data Repository, given Open Access, done new seismic data collection, new method of computing and digitisation has been adopted. Therefore, today, the same sets of data are showing new probability.

I am confident that by next year, the hub will come up automatically. Due to our policy reforms we are investing more in pipelines, supporting and encouraging setting up of more LNG terminals and 70 per cent of the population will be covered with piped gas network. Then there is a huge initiative in compressed biogas. Besides these, reforms in exploration and production industry give me confidence that in the next five years domestic gas production will be substantial.

Also Coal Bed Methane will show more results, and then there will be coal based synthetic gas. So there will be different sources of gas — natural gas, gas from biomass, CBM, LNG and synthetic gas — coming at varied prices. Automatically they all will blend and an exchange is a natural requirement for this.

About 100 TCF of Natgas yet to be Discovered in India

BP Chief

A rather optimistic Bob Dudley, Group CEO of BP plc, believes that India still has the unexploited potential of natural gas.

Dudley, who was in India recently, said that "I believe that there are close to 100 trillion cubic feet of natural gas resources yet to be found below ground here in India. That in itself can meet half of the natural gas demand out to 2050."

But a lot will depend on how the economics works out. "India also has the right resources above and below ground. It has relationships in place to maximise those resources. And it has a responsible policy in place to enable those relationships to run effectively and efficiently," he added. However, to develop these resources is not cheap, and it will be about good economics — pricing. East coast deep water has natural gas, but it is costly to develop and to do whatever to create the economics of price has to be suitable for the developer too.

Dudley said that his optimism also comes from the work which BP is doing with partner in India, Reliance Industries Ltd. (RIL). BP-RIL recently acquired one more block, and the existing asset is rearing to produce more, he said, "It's going to take a lot of exploration and will require economics to be right. It's expensive deeper offshore, but once you get the networks and the pipelines in place, India is going to need every fuel it can get," he added.

"However, you need to do whatever you can do to replace coal with clean natural gas, and that will reduce emissions. And you can use India's gas instead of buying expensive LNG,".

'Maharatna' Status to Hindustan Petroleum and Power Grid Corp

The Government recently accorded 'Maharatna' status to state-owned Hindustan Petroleum and Power Grid Corporation, thus giving them greater operational and financial autonomy.

The grant of Maharatna status to the PSUs will impart enhanced powers to their Boards to take financial decisions.

Power Grid Corporation of India Limited is India's largest electric power transmission utility firm. It is a listed company since 2007.

Private and Foreign Players can Engage in Fuel Retail

The Union Cabinet recently approved changes in guidelines for granting permission to companies to for marketing of transportation fuels.

The new guidelines have lowered the entry barrier by bringing down the minimum networth requirement from the existing Rs 2,000 crore to Rs 250 crore; allow even non-oil companies to invest in the retail sector doing away with the existing requirement of prior investment experience in the oil and gas sector; and provide flexibility in setting up a joint venture or subsidiary for market authorisation.

"This marks a major reform of the guidelines for marketing of petrol and diesel. (The existing policy) has now been revised to bring it in line with the changing market dynamics and with a view to encourage investment from private players, including foreign players, in this sector,"" said an official statement.

It added that as a result of the change in policy, more private players, including foreign players, are expected to invest in retail fuel marketing leading to better competition and better services for consumers. Also, the new entities will bring in latest technology for marketing of fuels and also encourage digital payments at the retail outlets.

Under the revised guidelines, the authorised entities are required to set up minimum 5 per cent of the total retail outlets in the notified remote areas within 5 years of grant of authorisation. Also, an individual may be allowed to obtain dealership of more than one marketing company in case of open dealerships of PSU oil marketing companies but at different sites.

The existing policy for granting authorization to market transportation fuels had not undergone any changes in the last 17 years. The Government said the new policy will give a fillip to Ease of Doing Business with transparent guidelines and boost direct and indirect employment.

Foreign oil firms like Saudi Aramco, Puma Energy and France's Total are reportedly interested in setting up fuel stations in India.

GAIL to expand Pipelines, City Gas Network

Dr. Ashutosh Karnatak

GAIL India Ltd will invest over Rs 45,000 crore over the next five years to expand the National Gas Grid and city gas distribution network, its Chairman Dr. Ashutosh Karnatak said recently.

"At present, your company is expanding the natural gas pipeline network by executing more than 5,700 kilometers of major projects," Dr. Karnatak said at the company's Annual General Meeting.

GAIL currently operates 11,000-km of pipeline network and markets two-thirds of all natural gas sold in the country.

"Investments worth over Rs 45,000 crore are envisaged in coming few years, across major cross country pipeline projects along Urja Ganga Project, Koch-Kootanad-Bangalore-Mangalore, Indradhanush North East Gas Grid and other crucial pipelines connecting supply and demand centres envisaged under the National Gas Grid," he said.

HPCL to Invest Rs 74,000 crore

Mr. M. K. Surana

Hindustan Petroleum Corporation (HPCL) is planning to invest around Rs 74,000 crore over the next five years to expand capacity.

The Navaratna company plans to invest around Rs 14,900 crore in the current fiscal, Chairman Mr. Mukesh Kumar Surana told

shareholders after the Annual General Meeting recently.

"We are focused on strengthening refining and marketing through expansion of our refining capacity, supply chain capabilities and customer reach.

"In addition, the thrust is on creating new levers of growth by establishing a strong presence in petrochemicals, scaling up footprints in natural gas and expanding marketing overseas," he said.

The company, whichowns and operates three refineries, has undertaken capacity expansion at refineries at Visakhapatnam and Mumbai.

The modernisation of the Visakhapatnam refinery will enhance capacity from 8.33 million tonnes to 15 mt. The capacity of the Mumbai refinery is also being enhanced from 7.5 mt to 9.5 mt. "On completion, these projects will enhance our profitability. We will have the capability to produce BS-VI fuels," he added.

Mr. Surana further said the 9 mt greenfield refinery-cum- petrochemical project coming up at Pachpadra in the Barmer district of Rajasthan has achieved significant progress.

"Engineering activity is in progress and construction has commenced. Financial closure has also been achieved for this project. The project is being implemented at a cost of Rs 43,129 crore," Mr. Surana said.

Interactive Meeting with the South African Delegation

A meeting with a Delegation from South Africa was held on 10th October 2019 at FIPI Board Room, New Delhi The Forum's Team was headed by Mr K S Popli, Chairman, Renewable Group, IEF and Former CMD, IREDA. The other Members were Dr Malti Goel, Convenor, Renewable Group, IEF; Mr V Raghuraman, Former Director, Suzlon; Mr K L Chugh, Chairman Emeritus, ITC and Mr Amarjit Singh, SG, IEF.

South African Delegation was led by Mr Recado Andrews, Minister Counsellor, South African High Commission. The other members were Mr Lwazi Koyana, MD, Nations Capital Advisors; Mr Bharad Roopa, Edelweiss; and Mr Roy Naidoo, Edelweiss.

Although Edelweiss is active in India in financing and investments, they are now looking forward to expanding commercial relations especially in renewable energy projects.

The South African team was in India to discuss opportunities for expanding relationship in the Renewable sector projects both in India and South Africa. Edelweiss feel that corporate not fully aware of opportunities.

The discussion was constructive and their queries were answered by Mr Popli and others.

New Electricity Act

Power Minister Shri R K Singh

The Electricity Act of the country must be a legislation which provides for the rights of all stakeholders, says Mr. R.K. Singh, Minister of State (Independent Charge) of Power and New and Renewable Energy. Keeping this mind, Singh and his team in the Power Ministry are working on a new Act.

"The main focus of the new law would be enhancing the rights of all the stakeholders," he said.

Mr. Singh, who is also formulating a new tariff policy, in conversation with Business Line, he said "Discoms cannot pass on their inefficiencies to consumers by levying higher tariffs. The cross subsidy needs to come down." Excerpts:

We need to have a reliable, sustainable power system to be a developed country. We also need to put in a different orientation for consumers in the Statute books. Under the proposal the consumer has rights and they have to be listed out with the remedies a consumer can have.

Also the system has to be sustainable. We cannot be sustainable if we run huge losses, if investments do not come, and if there is no ease of doing business. The investor's first concern is payments. We have addressed this by enforcing the letter of credits before power dispatch.

The second is, suppose the coal price goes up and the project does not get a pass through for ages, the investor ends up making a loss. So, to ensure ease of doing business the pass through has to happen in a specific period. These will all be a part of the tariff policy.

To enforce fairness, the policy will not let the Discom to pass on the inefficiencies to consumers. If you are inefficient, you deal with it differently and the State Government will have to give a grant. But, you cannot burden consumer with higher tariffs because of inefficiencies. The cross subsidy needs to come down.

We have given the States nearly Rs. 80,000 crore for improving their distribution system. This money is for buying transformers, setting up substations, buying poles, meters. We are also working on switching the entire system to pre-paid concept. This removes the hassle of billing and allows the poor be connected depending on convenience and purchasing power of the consumer. The Discom gets paid upfront so that there is no hassle of disconnecting for non-payments.

By and large States have been supporting these moves because they realise that they are also making money. The earlier systems and investments would get upgraded due to investments from the State and Centre, but they would eventually get run down again because the losses will continue.

Major Structural Reforms on the Cards

Shri R K Singh

Edited Excerpts

We are very much on track to achieve the target of 175 GW by 2022 for which a clear roadmap has been drawn. The 'Kisan Urja Suraksha evam Utthaan Mahabhiyan (KUSUM) scheme, where farmers can not only generate power using solar and even sell surplus power to discoms is under way. So far, only 1.75 million units have switched to solar for their irrigation pumps and 1 million are connected to the grid. We intend to have all the irrigation pumps in the country switch to solar in the next three years. Solar irrigation pumps will be a big thrust area for achieving the 450GW target.

The power sector is going through troubled times and according to a recent RBI report, the total debt burden of India's states is expected to touch Rs 52.52 lakh crore by the end of 2020 fiscal, an 11.5% rise from the previous

year. One of the major reasons for this is the indebtedness of power distribution companies or discoms. Mr. R K Singh said in an interview with Times of India.

The Government is working on a new scheme for discoms with loss reduction trajectories for each state. Can you elaborate?

So far, we had the Ujwal Discom Assurance Yojana (UDAY) which laid out the trajectory for loss reduction of discoms. According to the scheme, if you follow the trajectory, we will give incentives where part of your loan will be turned into transaction. I am changing this somewhat. The term of UDAY is over. It has led to some gains. The losses have dropped from about 21% to 18%. We have not reached the level of reduction that was envisaged. So, we are now working out a fresh trajectory which will reduce losses to below 15%. This is to be done in a time-bound manner. For strengthening of discoms, we had two different schemes for strengthening – Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme (IPDS). We will combine these and make provisions where we will provide money to states for taking action to reduce the losses. We'll also provide money to states for filling the gap for infrastructure required for 24x7 power supply.

The Government has also been working on plans to give multiple choices to power consumers...

The sector is facing multiple challenges from inefficiency of discoms, bank finances, stressed assets and capacities lying idle.

Land availability remains a major challenge for the sector. There are different reasons and we are dealing with them. In the case of coal fired projects, we are in talks with banks to find a solution for stressed assets. We have also received complaints from a state regarding availability of coal and have taken it up with the coal ministry. The fluctuating prices of LNG have been a cause of concern for gas-based power projects. But the future is bright. We need hydro and gas-based projects to balance with renewable generation. We are counselling states about the sanctity of power contracts after a couple of them were found to be dishonouring PPAs. Also, states cannot charge Rs 8-9/unit to industries for the power that they get for an average of Rs 3.5 per unit. This is hurting investments, it is hurting jobs. States have to clear dues of power generation companies to boost investor confidence and draw investments.

Norms for EV Charging Infra Issued

To promote Electric Vehicles (EV), Power Minister Mr. R K Singh recently approved amendments in guidelines and specifications for charging infrastructure.

These revised guidelines and specifications shall supersede the earlier guidelines and standards issued by the Ministry of Power on December 14, 2018, according to a statement by the Power Ministry.

Mr. Singh said in the statement that the revised guidelines are more consumer friendly, as they incorporate a number of suggestions received from various stakeholders.

"We have tried to address the concerns of EV owners in new guidelines," he added and expressed hope that the new guidelines will encourage faster adoption of EVs in the country.

To address the range of issues of the EV owners, a phase-wise installation of a network of charging infrastructure throughout the country has been envisaged in the new guidelines to ensure that at least one charging station should be available in a grid of 3 km X 3 km in the cities and one charging station at every 25 km on both sides of highways and roads.

It has been envisaged that in the first phase (i.e. 1-3 years), all mega cities with a population of over four million as per Census 2011, all existing expressways connected to these mega cities and important highways connected with each of these mega cities may be taken up for coverage, while in the second phase (3-5 years), big cities such as state capitals, Union territory (UT) headquarters may be covered for distributed and demonstrative effect.

To Fix Power Sector

Political Commitment Needed

Economic Times

It is high time the political leadership found the courage to ask people to pay for the power they consume, and stopped pretending that financial engineering can fix the problem of ever-mounting losses of power distribution companies. A quarter century after reforms meant to improve utility bottom lines, it has now been reported that outstanding dues of distribution companies, or discoms, across states have ballooned to Rs 72,862 crore by June-end. This shows that the Ujwal Discom Assurance Yojana (UDAY), under which state Governments took over the debt incurred by loss-making discoms, has been a failure. This is no surprise.

The political class, cutting across parties, insists on giving power away for free to farmers and patronises rampant theft of power. This is at the root of the problem in the power sector, which has produced, besides putatively stranded, surplus power producers in this country of abysmally low per-capita power consumption, a huge burden of non-performing assets (NPAs) on the books of banks that lent to power generators. The grim reality is that unless state Governments muster the political courage to purposefully ask people to pay for the power they consume, the sector will remain in crisis and no amount of financial innovation would help. And the mounting losses of power utilities would affect the quality of power, needlessly compromise state finances and stymie the overall economic growth momentum.

The talk now is of providing special loans to discoms so that they can square their dues with power generators. It would merely amount to throwing good money after bad. Sure, there's a case for transparent subventions on power supply that are duly budgeted and well-targeted; open-ended subsidies and giveaways are plain reckless and simply make no sense. The way forward is to set up a proper competitive market for power. Without an efficient, functional power sector, India cannot progress as a nation. India cannot afford the populism of free power and patronage of power theft.

Subdued Thermal Capacity Addition Over FY20-FY21

Ind-Ra

India Ratings and Research (Ind-Ra) said recently it expects coal-based capacity addition in the Indian power sector, which fell to a low of 3.6 gigawatt in 2018-19, to remain subdued at five to six GW per year in this fiscal year and next.

This likely decline in thermal capacity addition is attributed to decommissioning of nearly two GW annually as the plants complete their useful life; stress in nearly 85 per cent of the private under-construction capacity given the issues with regards to availability of funds, coal, power purchase agreements and evacuation; and decline in fresh project starts across the central, state and private sectors.

Between 2012-13 to 2016-17, excess capacity in the thermal power sector had increased to an average of 42 per cent on account of a significant increase in capacity and lower-than-expected growth in power demand. The excess capacity touched a peak of 45 per cent in FY16, and then declined subsequently to around 42 per cent at FYE19.

Power demand is likely to see healthy growth during FY20-FY24, and only a part of the incremental demand can be met by existing and upcoming renewable capacities. Considering the absence of any major alternatives to meet the growth in demand, the proportion of excess capacity in the thermal power sector would decline further during FY20-FY24, said Ind-Ra.

The slowdown in new thermal capacity addition by the state and central thermal sectors will also support the absorption of excess thermal capacity over this period.

Fresh project starts for thermal projects declined steeply to a mere 1.6 GW in FY19 from an average of 10 GW per year over FY15-FY18. The private sector's contribution to fresh projects was nil during FY19, signalling the private players' lack of interest in the thermal sector.

Another interesting trend is the shift from private sector to the state and the central sectors, with the bulk fresh project starts coming in from the state sector. However, the intensity of capacity addition by the public sector too is declining. Ind-Ra's analysis suggests that even in the public sector, the central sector is shying away from fresh project starts due to its increasing focus on renewable energy.

The quantum of under-construction projects declined to 65 GW in FY19 from 95 GW in FY13. The decline was mainly driven by the private sector, which saw under-construction capacity falling to 24 GW in FY19 from 63 GW in FY13. Additionally, a bulk of the under-construction capacity in the private sector is stressed and is unlikely to be completed.

NTPC Plans Greenfield Hydropower Project In Himachal Pradesh

NTPC Limited plans to set up a 4000-5000 MW greenfield hydropower project in Himachal Pradesh at cost of about Rs.4,000-5,000 crore.

The announcement could be made as early as next week and the project may cost in the range of Rs,4,000 core to Rs.5,000 crore," an NTPC official told business Line adding that this greenfield project is in line with NTPC's plans to diversify its power generation portfolio that is predominantly coal-based.

The present installed capacity of NTPC is 55.786 MW. This includes 7,801 MW through joint ventures and subsidiaries. In total, there are NTPC stations of which 22 are coal based, seven combined cycle gas/liquid fuel-based stations, two hydro-based stations and one wind-based station.

Of the 10 joint venture stations, nine are coal-based, one is gas based and 11 are renewable energy projects.

In another move that will reduce the group's dependence oncoal for power generation, NTPC is eyeing a 5,000 MW Mega Renewable Energy Park.

A 25,000 acre land for this park has been identified in Kutch, Gujarat. "We plan to complete this park in the next five years (by 2024). It will have solar power generation facilities, and opportunities to set up storage manufacturing plants too. It will require an investment of Rs.20,000-25,000 crore," the official said. The decision to set up the solar park follows the recent move by the Andhra Pradesh Government to renegotiate tariffs achieved in renewable energy projects after bids jointly conducted by NTPC and the Solar Energy Corporation of India.

"This has deeply affected investor sentiment and now we are looking at options where such a situation can be avoided," the official added. NTPC also intends to increase coal mining through its newly-formed subsidiary. Presently, the group has 10 coal mines of which two are operational, these mines are expected to be hived into this subsidiary.

Bad Loans Ailing India's Power Sector

TERI

Around Rs 1 lakh crore worth of loans extended to the thermal power companies in India have gone bad, comprising 18 per cent of the total outstanding debt for the power sector, according to The Energy and Resources Institute (TERI).

"The causes of these stranded assets were the imprudent capacity expansion that occurred in the period 2010-15; demand growth slowdown

after 2012; and upstream (coal linkages) and downstream (Power purchase agreement tie-ups) challenges in the power sector value chain," the institute has said in a research paper.

Due to the occasionally reckless expansion of coal-fired generation capacity in the period 2010-2015, there is now a substantial capacity of coal-fired plants that are stranded or stressed assets, according to the paper authored by TERI Fellow Thomas Spencer.

The stranded or stressed generation capacity includes 54,000 Megawatt (Mw) of coal-fired plants and 7,000 Mw of natural gas-fired projects. The study found that while supply has improved and the energy deficit has come down, many parts of the country still face unreliable supply with rural areas facing typically 20-30 interruptions per month.

The paper also said Aggregate Technical and Commercial (AT&C) losses in the electricity sector at 18.7 per cent remain very high as compared to other nations. "End-user prices are distorted by cross-subsidy with an aggregate gap between cost of supply and revenue realization still of about Rs 0.26 per kWh. This implies an annual revenue shortfall of around Rs 32,600 crore or 1.6 per cent of the total annual tax intake," the paper said.

Conference on "Future of Power in Tamilnadu"

6th September 2019, Chennai

India Energy Forum in association with Madras Chamber of Commerce and Industry organised our Annual Summit in Chennai on 6th Sept 2019. The theme of the Summit was "Challenges, Innovation and Energy Technologies in Power Sector".

The Summit was inaugurated by Hon'ble Minister of Electricity Shri Thiru P Thangamani, Government of Tamil Nadu.

President, IEF, Mr Anil Razdan, Mr H L Bajaj, Chairman, Power Group, Mr. K.S. Popli, Chairman, Renewable Group. IEF and Mr B Bhambhani Convenor, Power Group represented IEF.

The emphasis in the Summit was laid on Digital Technologies in the maintenance of large power projects, role of electric vehicles in the future and share of Renewables in the total, power generating capacity of Tamil Nadu.

The Presidential address was delivered by Mr Anil Razdan, who gave detailed background on the association of IEF and MCCI and congratulated State Government for travelling from Power deficit state to Power surplus state.

Hon'ble Minister of Electricity Tamil Nadu shared the programmes of State Government to achieve 24/7 power supply to all in the state.

The Conference was largely attended and was addressed by many sectoral leaders.

India Energy Forum and MCCI agreed to continue their association to organise this Summit in Chennai.

FDI in Coal Mining

Coal and Mines Minister Mr. Pralhad Joshi said, "Hundred per cent FDI is the biggest reform of our times and the influx of international players will create an efficient and competitive coal market in India."

The Government is likely to auction large coal blocks for commercial mining to Indian and overseas miners by the end of November.

International mining agencies from Australia and Canada have been evincing interest in coal mining in India, the official told ET recently, a day after the Union Cabinet allowed foreign companies such as BHP, Pea Body and Glencore to mine coal and carry out related operations in the country. The Government approved 100% foreign direct investment (FDI) under the automatic route in mining, sales and associated infrastructure.

"The next tranche of coal blocks auction will offer mines to global companies for commercial mining. The next auction is likely to be held by the end of November. The ongoing round of auctions will conclude in mid-November," said the official, who did not wish to be identified.

The Coal Ministry early this month initiated auction of 27 coal mines and allotment of 15 coal mines to public sector firms. Of the 27 identified blocks, 21 have been reserved for auction to all non-regulated sectors such as steel and cement and six coking coal mines for iron and steel. In case of allotment, five coal mines are for power sector, nine for sale of coal and one for iron and steel. Bids have to be submitted by September 19 and the electronic auction will be conducted between October 10 and November 8.

Plugging Coal Import Gaps:

Mr. Anil Kumar Jha

Edited Excerpts from an interview

Coal India needs to step up production to meet India's coal import requirements of 235 million tonnes. The state-run miner must do this, overcoming its own constraints and increasingly erratic and taxing climatic conditions.

Competition is welcome, we are ready for it.

As far as Coal India is concerned, there is absolutely no slowdown. We are not in a position to meet country's coal demand. Last year, CIL produced 607 million tonnes of coal and the country, as a whole, produced 730 MT. So 83% was from Coal India Ltd. But consumption was 965 MT, so we had to import 235 MT of coal. Demand is increasing and we are trying to bridge the demand supply gap as much as possible.

Coal India behind the target this year?

In the last six months, we have fallen behind our target. We are behind by around 20 MT. We are trying to make up for it in the coming six months. It is due to a host of reasons. In case of MCL (Mahanadi Coalfields Ltd), we suffered a lot due to cyclone Fani in Odisha. In August and September, the same coalfields were hit by excessive rains. We also had some law and order issues in some other subsidiaries.

Coal India asks for a Coal Regulator

India needs a coal regulator in the line of TRAI or CEA especially since the sector is being opened up to foreign investment and commercial mining is being allowed, M K Singh, technical secretary to Coal India chairman, said at 13th Coal Conference in Kolkata recently.

"One thing we are missing is the National coal regulator for industry of such a size and such diversity. This is the time we should plan for a very strong coal regulator combining nitty-grities of all stakeholders," Singh said.

In wake of opening up of coal sector for foreign direct investment and allowing commercial mining the coal ministry is framing a National Coal Index Singh said.

A high-powered panel in 2018 had recommended developing a Coal Index for determining the value of blocks and a revenue-sharing model with the states. Currently, the valuation is on the basis of the notified price of Coal India Ltd.

"CIL's growth plan for the future is in synergy with the ambitious plan of the Government for 24X7 power supply to all homes in the country for which a roadmap to achieve 880 million tonnes of coal production by 2024-25 has been finalised," said Singh.

Centre for Clean Coal Research

With the aim of addressing opportunities and challenges in the development of clean coal technologies, the National Centre for Clean Coal Research and Development (NCCCR&D) has been launched at the Indian Institute of Science (IISc.) by the Department of Science & Technology (DST).

NSSSR&D is a national consortium on clean coal research and development led by IISc. with IIT- Kharagpur, Madras, Guwahati, Bombay, and Hyderabad as partners.

The consortium will work on identifying existing gaps in clean coal technology as the major problem Indian power plants were facing was a high level of pollutants and low thermal efficiency. The centre will also address challenges like development of low emission combustion and gasification, and achieve high cycle efficiencies with reduced pollutants, an IISc. note stated.

The IISc. has already set-up an advanced indigenous supercritical CO2 test loop at a laboratory scale. Inaugurating the centre here recently, Union Minister of Science and Technology, Earth Sciences, Health and Family Welfare Harsh Vardhan said scientific and collective endeavours such as the centre would enable achievement of an affordable, efficient, and compact reliable clean energy system.

He added that it would help the country in achieving international targets on climate change. "Our target for 2030 is to have at-least 40% of our total requirement of energy to be from clean energy sources. We have already achieved around 34-35%. This is a significant progress," he said.

52 Coal Mines Opened in 5 Years

The Government has opened 52 new coal mines since coming to power to fuel its flagship village and household electrification programmes without tripping the system, officials told TOI.

These 52 mines represent 86% growth over the number of mines added in the five-year period between 2009 and 2014, when most projects were stuck in red tape, especially pertaining to environment and forest clearances, before the NDA Government took over.

The officials said structural reforms in the Government's functioning since 2014 made it possible to quickly open such a large number of coal mines, a cumbersome process involving approvals and permissions from various statutory authorities.

The new mines have added 164 MT (million tonne) to India's annual coal production capacity, marking 113% increase over capacity added during the 2009-2014 period. Since 57% of power is generated in India by burning coal, these mines allowed the Government to rapidly move towards universal electricity access without creating shortages.

Coal and Railway Minister Piyush Goyal told Parliament in a written reply that all-India coal production stood at 433.9 MT during the April-

November period of 2018-19 financial year, indicating a growth rate of 9.8%. During the same period, state-run Coal India Limited's production stood at more than 358 MT, marking a growth rate of 8.8% over the previous corresponding period.

Coking Coal Imports at 51.84 MT in 2018-19

The country has imported 51.84 million tonnes of coking coal in FY19, Parliament was informed recently. "The entire demand of coking coal is not met from domestic production as the supply of high quality coal/ coking coal (low-ash-coal) in the country is limited and thus no option is left but to resort to import of coking coal," Coal Minister Mr. Pralhad Joshi said in a reply to the Rajya Sabha.

During 2018-19, coking coal import stood at 51.84 million tonnes (provisional), he said.

"Reduction in Import of coal in the country is always a priority area of the Government," the minister noted.

The Government has taken steps in order to increase availability of coking coal, he informed the house. Coal India Ltd (CIL) has planned to increase coking coal output from 34.12 million tonnes (MT) to 52.95 MT by 2019-20. CIL also plans to set up nine new coking coal washeries by 2020-21. "Supply of washed coking coal to Steel sector - will be enhanced to 15 MT in 3/4 years from now from the present level of 1.6 MT," the Minister said.

To Attract Foreign Investments

Larger Coal Blocks

The Ministry of Coal is looking at ways to attract foreign participation in the coal mining sector. One of the options being considered is carving out larger coal blocks to meet the requirements of foreign investors, said Coal and Mines Minister Pralhad Joshi.

Speaking at a recent conference Mr. Joshi said, "We have opened up the coal mining sector for Foreign Direct Investment under the automatic route. We are formulating various policies to attract foreign investors and private sector within the country."

India will remain dependent on coal for a large chunk of power generation. Mr. Piyush Goyal, Minister of Railways and Commerce and Industry, said, "All over the world, coal was the primary driver of energy needs, particularly low-cost energy, during the development cycle of different nations. The United States, Europe, China, Russia, all have used coal extensively to meet their development abilities. They wouldn't have reached where they are today, had they not used that much coal. Even today, our per capita consumption of coal is probably one-seventh or one-tenth of what it is today in the US."

"Even in absolute terms, they (US) consumes nearly twice as much coal as India consumes even today," he added.

Replacing Coal with Gas or Renewable Energy Sources

Duke Study

A research has found that the transition from coal to natural gas in the US electricity sector is reducing the industry's water use. It is helping in saving water and contributing to reducing water scarcity.

For every megawatt of electricity produced using natural gas instead of coal, the water withdrawn from rivers and groundwater drops by 10,500 gallons, and water consumed for cooling and other plant operations and not returned to the environment drop by 260 gallons. Switching to solar or wind power could boost these savings even more.

"While most attention has been focused on the climate and air quality benefits of switching from coal, this new study shows that the transition to natural gas

-- and even more so, to renewable energy sources -- has resulted in saving billions of gallons of water," said Mr. Avner Vengosh, professor of geochemistry and water quality at Duke's Nicholas School of the Environment.

These savings in both water consumption and water withdrawal have come despite the intensification of water use associated with fracking and shale gas production, the study says.

"For every megawatt of electricity produced using natural gas instead of coal, the amount of water withdrawn from local rivers and groundwater is reduced by 10,500 gallons, the equivalent of a 100-day water supply for a typical American household," said Mr. Andrew Kondash, a postdoctoral researcher at Duke, who led the study as part of his doctoral dissertation under Mr. Vengosh.

Water consumption -- the amount of water used by a power plant and never returned to the environment -- drops by 260 gallons per megawatt, he said.

At these rates of reduction, if the rise of shale gas as an energy source and the decline of coal continue through the next decade, by 2030 about 483 billion cubic meters of water will be saved each year, the study predicts.

If all coal-fired power plants are converted to natural gas, the annual water savings will reach 12,250 billion gallons, that is, 260 per cent of current annual US industrial water use.

"For every megawatt of electricity produced using natural gas instead of coal, the amount of water withdrawn from local rivers and groundwater is reduced by 10,500 gallons, the equivalent of 100-day water supply for a typical American household," added Mr. Kondash.

At these rates of reduction, if the rise of shale gas as an energy source and the decline of coal continue through the next decade, by 2030 about 483 billion cubic meters of water will be saved each year, the Duke study predicts.

MMDR Act to be Amended

With a view to expedite the process of giving mining lease, the Coal Ministry is looking to do away with the need for taking 'prior approval' of the Centre before the State hands over the mining lease. This would call for an amendment to the Mines and Minerals Development and Regulation Act (MMDR), 1957. It is a fairly simple exercise and is likely to come up in the next session of Parliament," he said.

According to Mr. Chaudhuri, under the current regime, the State Government has to go for a prior approval from the Central Government after receiving necessary clearances such as environment, forest etc, before it can hand over the mining lease to a company. This would delay the entire process by about 6 months to a year. Once the amendment happens, the system of clearance will become easy and expedited.

The Ministry of Coal is also looking at a system of accreditation for bringing in more players — both from public and private sectors — into coal exploration.

7th Roundtable Conference on Coal

24th September 2019, New Delhi

The India Energy Forum (IEF) together with Mining, Geological and Metallurgical Institute of

India (MGMI), Delhi Chapter and Indian School of Mines Alumni Association (ISMAA) had organised its biennially Round Table Conference on Coal on 24th September 2019 at Le Meridien Hotel , New Delhi. **The theme of the Conference was "Indian Coal – Potential and Diversification".**

The Conference was inaugurated by Shri Pralhad Joshi, Hon'ble Minister of Coal, Mines and Parliamentary Affairs. The Guest of Honour was Shri S C Garg IAS, Secretary, Ministry of Power. Shri Anil Razdan, President, India Energy Forum delivered the Welcome Address and the Theme Address was given by Shri U Kumar, Former CMD, . Shri G C Mrig, President, ISMAA DC, Shri Rakesh Kumar, CMD, NLC India Ltd, and Dr Anindya Sinha, Advisor, Ministry of Coal also addressed at the Inaugural Session. Compare and Introductory remarks was given by Shri N N Gautam, Convenor, Organising Committee.

Technical Session I: **"Coal Production: Meeting the Demand** – The Session was chaired by Shri Alok Perti IAS (Retd), Former Secretary, Ministry of Coal and co-chaired by Dr Ranjit Rath, CMD, MECL. The other distinguished speakers were Shri Gopal Prasad, GM (PAD),; Shri Vivek Bhatia, Mg Director, Thyssenkrupp Industries India; Shri R M Wanare, GM (Mining), Coal India Ltd; Shri Sariputta Misra, Head of Mining, NTPC jointly with Shri A. S. Subramanian, AVP and Project head (TSMPL). The Session Coordinator was Shri Ashok Mehta, Former CMD, WCL

Technical Session II: **Indian Coal: Production and Diversifications** - The Session chaired Shri Tuhin Mukherjee, Mg Director, EMIL and co-chaired by Shri Rajiv Shekhar, Director, IIT- ISM. The other distinguished speakers were Mr. Richard A Horner, Director, Special Projects & Emerging Technology, School of Energy Resources, Univ of Wyoming; Prof. AK Singh, Former CMD, CMPDI and Professor, ISM; Shri Shouvik Majumder, Sr President, Head-Mining & Minerals, Hindalco; and Shri Pankaj Satija, TATA Steel. The Session Coordinator was Shri P S Upadhyaya, Former Director (T), NMDC.

Technical Session III : **Diversification of Usage of Indian Coal** - The Session was chaired by Mr N C Jha, Former CMD, CIL and co-chaired Shri M N Jha, Advisor, JP Group. The other distinguished speakers were Dr A K Balyan, CEO (Oil & Gas), ADA Group - Coal to Oil; Shri A.N. Tiwari, JSPL - Surface Gasification (KD); Shri P N Hajra, Former ONGC; and Shri Prodyut Maji, Head – Gasification & Petrochemicals, Adani Synenergy Ltd. The Session Coordinator was Shri V K Sehgal, Former CMD, SECL

Valedictory Session: Dr Kirit Parikh, Former Member (Energy), Planning Commission was the Chief Guest. The Session was co-chaired by Shri Peeyush Kumar, Director (Tech), Ministry of Coal. The other Distinguished Panelists were Shri S.K. Chowdhary, Former Chairman, CIL; Shri PR Mandal, Former advisor (Projects), Ministry of Coal; Dr Rahul Tongia, Brookings India; and Shri Kapil Dhagat, Executive Vice President (BU Coal), JSPL.

The Draft Recommendations emerged during the Conference were ready by Dr M M Seam, Former Advisor, Essar Minerals. The Session Coordinator was Shri SK Grover, Former GM (Fuels), NTPC.

Edited and Printed by **Mr. Amarjit Singh, MBE** Secretary General

Published by **Mr. R. M. Sodhi** on behalf of

INDIA ENERGY FORUM

Registration No. DELENG/2007/20915

408, PHD House, 4/2 Siri Institutional Area, August Kranti Marg, New Delhi-110 016
Tel: 011-41021422-23 Email: iefindiaenergyforum@gmail.com

India to add 20,000 MW of Nuclear Power Generation Capacity

Mr. K.N. Vyas

India is set to add around 20,000 Megawatt (Mw) of nuclear power generation capacity over the next decade, Mr. K.N. Vyas, Secretary at the Department of Atomic Energy (DAE) and the Chairman of Atomic Energy Commission (AEC) said recently.

Speaking at an industry event here, he said steady and un-interrupted power supply by nuclear power plants gives it an edge over solar and wind power. "There would always exist a requirement for steady and un-interrupted power supply represented by nuclear energy, especially since storage technology required to compensate for the lean period when wind does not blow or sun does not shine is currently rather expensive," he said.

He also said that the country has now started using higher capacity reactors to increase standardisation and is heading for fleet mode of construction, thereby reducing construction cost and speeding up construction time.

Mr. Vyas said nuclear energy with its almost non-existent carbon footprint is one of the cleanest options for reduction of global warming and climate change mitigation.

He added nuclear plants have several advantages in meeting base load requirements, land usage, raw material requirement and longer plant lives. "Solar and wind energy have their own drawbacks such as low energy generation-to-capacity ratio, requiring massive over-capacity and large spaces of land, especially for solar," he said.

Quoting a statement from an international energy agency, Mr. Vyas said that fission-based nuclear power has historically been a large contributor to carbon-free electricity globally.

Mr. Jitendra Singh, Minister of State (Independent Charge) for Prime Minister's Office; Personnel, Public Grievances and Pensions; Department of Atomic Energy and Department of Space, who was also present on the occasion, said the Government is working to diversify nuclear power and its applications in the areas which were earlier not known.

Mr. Singh said the Government is planning to set up north India's first Atomic Power Plant in Haryana. "Most of our nuclear power plants were earlier confined to the southern states of the country but now we have moved northwards. We will be having the first atomic nuclear energy plant installed at Gorakhpur in Haryana," he said.

Russia – India Cooperation

Above 20 Nuclear Power Units to be set up in India

Russia recently said that it is planning to set up more than 20 nuclear power units in India in the next 20 years.

Prime Minister Mr. Narendra Modi joint statement at the 20th Annual Summit between the two countries, along with Russian President Vladimir Putin by side.

The two sides exchanged numerous agreements, including military and technical cooperation, energy and science, LNG Business and LNG supplies, and natural gas, in the presence of the two leaders.

"I'm honoured to be the first-ever Indian Prime Minister to be coming to Vladivostok. I thank my friend, President Putin for inviting me here. I remember Annual Summit of 2001, first one held in Russia when he was President and I had come with former Prime Minister of India Atal Bihari Vajpayee's delegation as Gujarat Chief Minister," the Prime Minister said in the joint statement.

The leaders, on the occasion, noted that the friendship between India and Russia is not restricted to their respective capital cities. "We have put people at the core of this relationship," the Prime Minister added.

Meanwhile, Putin, on his part, said that both countries

share similar perspectives on certain aspects of international issues. The President also recalled that he met Prime Minister Modi on the sidelines of the G20 summit recently held in Osaka, Japan, and the Shanghai Cooperation Council (SCO) in the Kyrgyz capital of Bishkek.

"Russia and India today signed MoUs in various sectors, including civil nuclear and LNG. Regarding the Kundakulam nuclear power plant, the first and second units are working. The third and fourth are under construction. In addition, we have also decided to set up more than 20 Russian-designed nuclear units in India in the next 20 years," Putin said.

Meanwhile, a proposal was also made between India and Russia to have a full-fledged maritime route that serves as a link between Chennai and Vladivostok.

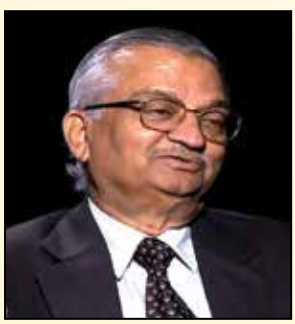
"We (India and Russia) both are against outside influence in the internal matters of any nation," Modi stressed.

The Prime Minister further said that Moscow's decision to confer him with the highest civilian award of the country-- the Order of the Holy Apostle Andrew the First-- is a matter of honour for him as well as the people of India.

In his departure statement ahead of his visit to Russia, Mr. Modi had said that strong bilateral partnership is complemented by a desire to promote a multi-polar world.

Nuclear Power: India's Development Imperative

A Study by Vivekanand International Foundation



A Taskforce headed by Dr. Anil Kakodkar has concluded that the Nuclear Power is India's Development Imperative. Edited Highlights:

In the Paris Conference on Climate Change, India committed to increase its share of non-fossil fuel in total installed power generation capacity from 30 percent in 2015 to 40 percent by 2030. The renewables currently account for 35.7 percent of India's installed power generation capacity. The Government has announced plans to increase renewables to 175 GW by 2022 from 70.6 GW as on 30 September 2018. This will entail balancing power sources that can rapidly respond like hydro or gas, since wind and solar are intermittent sources of energy and adequate base-load power capacity which can only be supplied by coal or nuclear.

Being an intermittent source of energy, renewables cannot provide base-load power critical for India's economic growth. At present, this requirement is essentially met by coal, which accounts for 55 percent of India's commercial primary energy supply1. Its share in India's power generation is 75 percent. However, rising environmental concerns make it imperative to significantly enlarge the share of a non-fossil source of stable, base-load power.

Nuclear energy can supplement coal as a source of stable, base load power, not supplant it. At present, it accounts for around two percent of India's installed capacity. However, the target of ramping up nuclear power from 6.7 GW at present to 63 GW by 2032 will increase its share in India's electricity generation portfolio to around ten percent. The presently sanctioned capacity is 22.48 GW to be progressively realised by 2031. There is thus a need to open up additional projects to realise the target of 63 GW and a more efficient project implementation framework for their timely completion.

As a source of base-load power, nuclear power has to be compared with coal, not renewables. In any comparison with coal, emission costs must be factored in. Broadly speaking, the country's energy mix should be determined on the basis of the availability of different energy resources and their pricing. Left to itself, the market would determine the evolution of this energy mix. This may or may not be consistent with the long-term energy or environment security of the country for

which a sizeable contribution from nuclear energy is vital. State policy to steer the energy mix towards long term national interest is, therefore, important. Without factoring grid/system costs of renewables, nuclear tariff may appear high. We should recognise that energy security can become a bigger challenge in the years to come. A well-designed financing and pricing policy should, therefore, be put in place at the earliest. Thus, as a minimum, measures to create at least a level playing field for nuclear energy recognising its strengths in energy security and absence of CO2 emission, are necessary.

In order to provide a level playing field, nuclear power should also be given incentives as provided to the renewable sector. It needs a 'must run status', as nuclear plants run on a continuous basis. Without this facility, there will have to be a steep increase in tariff to recover high capital cost. There are other incentives given to wind and solar power, which are presently not available to nuclear power in India. Loading for external costs is part of the cost evaluation of tariff from different sources of energy in the United States and the European Union. This is not so in India due to the direct and indirect subsidies given to solar and wind power by both the Central and State Governments.

Ramping up the nuclear power sector from 6.7 GW to 63 GW by 2032 will require considerable resources, financial discipline and reorganisation of the nuclear sector to bring in more players who can invest in expanding capacity. The Government's announcement of funding to the tune of Rs.3000 crores per annum for building ten reactors in fleet mode is a welcome step, but falls short of financial requirements.

For import of Russian reactors for Kudankulam, 1, 2, 3, 4, 5 & 6, NPCIL has negotiated soft credit. While making financing easier, the foreign credit sometimes limits scope of 'localisation'. For the Indian industry to grow in capacity, progressive indigenisation is essential. This is also needed to bring down costs and tariff.

There are other modes of financing. In the case of the UAE and the UK, they have allowed foreign companies not only to construct, but also to operate their nuclear power plants for extended periods. Applying this model to Indian conditions would require an amendment of the Atomic Energy Act. There are intermediate solutions such as encouraging PSUs like the NTPC and IOCL to form joint ventures with the NPCIL. This can be implemented within the present Act.

The NPCIL has to bring down the cost of construction to ensure that nuclear power continues to be affordable in the future. A key to realising this is to nurture optimum manufacturing capacity where there is not only good competition, but also confidence about continuity of work orders for competitive industries. Continuous orders are necessary for the vendor industry to invest in expansion of capacity. It also has to evolve procedures for fleet-mode construction. The Government has to allow flexibility in procurement procedures. Internally, company procedures must assure quality manufacturing and construction without interruptions. This also needs an increase in trained manpower. This will also generate considerable employment.

China's case is instructive. With the same cost constraints, and share of coal in energy profile as India, China is seeking to make nuclear power ten percent of its total energy requirement by 2030. Its civil nuclear programme started much later than India, nevertheless, it has focused on exports since inception. It also has a multiplicity of reactor types to avoid dependence on a single source. By using economies of scale, it has gone further and faster in indigenising technology and lowering production costs. Till recently, we could not access global markets, but that is possible now. We should now be proactive in exploring the global market not only for our PHWRs (Pressurised Heavy Water Reactors), but also globally explore the much larger market for LWRs (Light Water Reactors). This could be both for equipment and

components for LWRs of different designs and also for indigenously designed PWRs for which work is currently in progress.

The Inter-governmental Panel on Climate Change (IPCC) released its report in October 2018 in Incheon, South Korea. This is a sequel to the agreement adopted at the Paris Summit on Climate Change in 2015, which called for keeping global warming "well below" 2° Celsius (C) and above pre-industrial temperature levels. The agreement also urged all countries to "pursue efforts towards 1.5° C". The IPCC report brought out the difference between the 2° C target agreed and the more ambitious 1.5° C goal in terms of impact on poverty, agriculture and rise of sea level. It also brought out the cost of different adaptation and mitigation measures. Though the report does not represent an agreement at the Government level, it underlines the need for de-carbonisation of global economy5.

The current debate on the power sector in India is characterised by concern over low demand, stressed assets and the need to bring down tariff to compete with renewables, which have fallen to Rs. 2.5 per unit. However, the spot power price in September 2018 touched almost a 10year high of Rs 17.61 per unit on the Indian Energy Exchange (IEX) of spot prices. The spike was attributed to the decline in wind and hydro energy at this time of the year, coupled with constraints in the movement of coal to thermal power plants. While spot prices do not indicate a long term trend, they underline the difficulty of relying on renewables, which are an intermittent source of energy. The problem will get worse as the share of renewables in India's energy mix increases with the Government's goal of 175 GW of renewables by 2022.

The coal import bill last year was more than USD 9 billion. There seems to be an increasing trend for coal imports. In comparison to coal, the cost of nuclear fuel is a negligible component of operating costs of a nuclear power plant.

The rapid ramping up of installed nuclear power capacity from 6.7 GW to 63 GW by 2032 would require the Government to provide substantial resources to the NPCIL. This cannot be managed through internal accruals alone. There is also a need to look at financing models used by other countries, including the UAE and the UK, where credible international vendors with significant pre-existing domain expertise in nuclear power plant operation are allowed to acquire equity and operate the plant, while the Government gives long term tariff guarantees. This, however, would require amending the existing Atomic Energy Act. The NPCIL has to ensure timely completion of projects within the budget. Indian companies should form strategic tie-ups with international majors to be part of the international supply chain.

This report is an attempt to look at these and many other questions linked to the nuclear power sector dispassionately. The Vivekananda International Foundation task force was chaired by Dr. Kakodkar and included vendor industry and power sector representatives to present a holistic perspective. Some key recommendations are: (i) In the spectrum of choices available to provide energy for India's growth, the share of nuclear as a key source of stable, non-fossil base load power will have to go up. (ii) We should recognise that energy security is likely to become a bigger challenge in the years to come. A well-designed financing and pricing policy to steer the required transition in the energy mix should, therefore, be put in place as early as possible. Thus, as a minimum, measures to create at least a level playing field for nuclear energy, recognising its strengths in energy security and absence of carbon dioxide emissions are necessary. (iii) In order to provide a level playing field, nuclear power should be given incentives as provided to the renewable sector. It needs a 'must run status', as nuclear plants run on a continuous basis. Without this facility, there will have to be a steep increase in tariff to recover high capital costs. (iv) The NPCIL must reduce project costs

and the gestation period to bring down tariff. This requires timely completion of projects to minimise interest during construction. (v) The focus of the NPCIL should be on rapid capacity expansion through credit. (vi) The NPCIL must ensure adequate competition and continuity of orders for vendors. (vii) Indian companies must be competitive globally in terms of price and quality to get integrated in the international supply chain. (viii) The Government must provide additional resources over and above annual support pledged to NPCIL so far. Rs. 3,000 crore per annum would cover only a small fraction of the funds required to reach the target of 63 GW by 2032. (ix) The NPCIL's profitability must be maintained, so that it has enough internal resources to finance at least part of the expansion cost of the nuclear power programme.

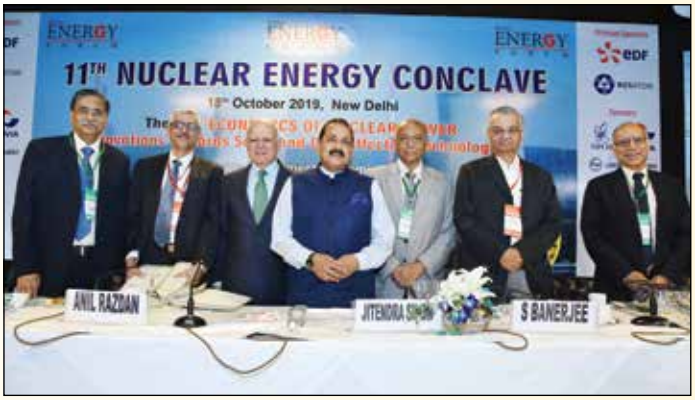
Nuclear power will be an indispensable component of India's national strategy to secure energy self-sufficiency. The expansion of the programme has to be combined with indigenisation to bring down costs. This would be in keeping with the Make in India programme and generate employment for 40,000 persons directly or indirectly. Nuclear power provides an option to harmonise India's developmental needs with increasingly stringent emission norms which are inevitable as global warming worsens.

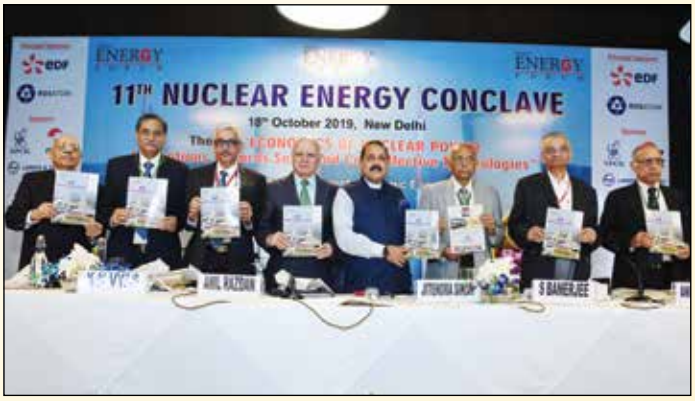
11th Nuclear Energy Conclave 2019

18th October 2019, New Delhi

The India Energy Forum organized its annual flagship event, 11th Nuclear Energy Conclave on 18th October 2019 at Hotel Le Meridien, New Delhi. **The theme of the Conclave was "Economics of Nuclear Power - Innovations towards Safer & Cost Effective Technologies".**

The Conclave was inaugurated by Dr Jitendra Singh, MoS (I/C) for DoNER, MoS in Prime Minister's Office, Deptt of Personnel and Training, Deptt of Space and Atomic Energy. Shri Anil Razdan, President, IEF and Former Secretary, Ministry of Power, Government of India, gave the welcome address. Dr. Srikumar Banerjee, Chairman, Nuclear Energy Group, India Energy Forum and Chancellor Homi Bhabha National Institute; Mr K N Vyas, Secretary, DAE and Chairman, AEC; Dr Anil Kakodkar, Former Chairman, AEC; Dr R B Grover, Member, AEC also addressed during the inaugural Session. Vote of Thanks was given by Shri S M Mahajan, Convenor, Nuclear, IEF and Former ED, BHEL.





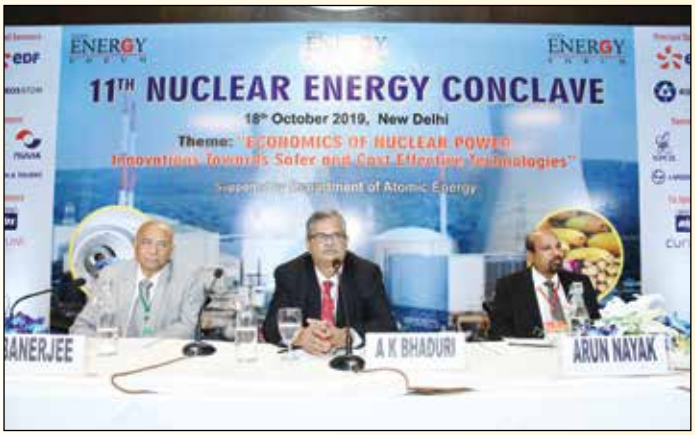
Technical Session I: "Growth of Nuclear Power for Meeting Base Load Demands - Opportunities & Challenges for Manufacturing Industry".

The Session was chaired by Shri A K Balasubrahmanian, Director (Tech.), NPCIL. The Distinguished Speakers were Dr Dinesh Srivastava, CE, Nuclear Fuel Complex; Shri Nikita Mazein, President, Rosatom Overseas; Shri Thomas Mieusset, Nuclear Counselor, French Embassy India; Shri YS Trivedi, Sr. Executive Vice President, Larsen & Toubro Ltd and Shri Avinash Jain, GM, BHEL .

Technical Session II on "Use of Nuclear Energy in Healthcare and Municipal Waste Treatment"-

The Session was chaired by Shri G Nageswara Rao, Chairman, AERB. The other distinguished speakers were Dr Harsh Mahajan, MD, Mahajan Imaging; Dr Sudeep Gupta, Director, ACTREC, Tata Memorial Centre; and Ms Kritika Kaur, Technical Manager, Nuvia India.

Technical Session III on "Emerging Technologies for Economy and Enhanced Safety viz, Small & Medium Size Reactors, Passive Safety Features, Molten Salt Reactors".



The Session was chaired by Dr A K Bhaduri, Director, IGCAR. The other Distinguished Speakers were Dr Srikumar Banerjee and Dr Arun Nayak, Reactor Engineering Division, BARC.

The Conclave proceeding were summed up by Shri S C Chetal, Mission Director, AUSC and Former Director, IGCAR.

FORTHCOMING EVENTS

- **22nd India Power Forum**
  27th November 2019, Hotel Le Meridien, New Delhi

  Theme: "Power Sector Agenda beyond 2020 – Challenges & Imperatives"

- **19th Renewable Energy Summit**
  17th January, 2020, Gulmohar, IHC, New Delhi

  Theme: Renewable Energy Trajectory - 2030

INDIA ENERGY FORUM

Urja Vichar Manch – 27th September 2019, PHD House, New Delhi

"Coal - Potential/Diversification"

The monthly meeting of the India Energy Forum's called **Urja Vichar Manch** was held on Friday, 27th September 2019 at Raunaq Room, PHD House, New Delhi. The key speaker of the meeting was **Mr. Richard A Horner**, Director, Special Projects & Emergingl Technology, School of Energy Resources, Univ of Wyoming. The topic was **"Coal - Potential/Diversification"**.

Shri Anil Razdan, President, IEF gave the welcome remarks. While the opening remarks was given by **Shri N N Gautam**, Chairman, Coal Group, IEF, Shri **S K Grover**, Convenor, Coal Group, IEF introduced the Speakers to the participants. **Shri U Kumar** also gave his remarks.

The meeting was largely attended by stakeholders and there was interesting discussion.

Undersea Natural Gas Pipeline from Oman to India

In India's quest for Energy Security, through a New Route, SAGE, a Global Consortium, is developing a $4.5 Billion world's deepest Common Carrier Natural Gas Pipeline, directly from Oman to Gujarat coast in India, through the Arabian Sea.
(A route via Oman is being looked at, in order to explore options to import gas from UAE/Saudi Arabia/Iran/Turkmenistan/Qatar, a region with 2500 TCF Gas Reserves).

Gas Qty: 31.1 mmscmd under a 20/25 years Long-Term Gas Supply Contract.
Pipeline tariff: USD 1.75 to 2.00 per mmbtu range.

Fuelling India's **'Make in India'** plans and **Gas based Economy** vision by this path-breaking infrastructure Project, for higher economic growth & moving to a **5 trillion USD economy** by year 2025.

Meeting needs of Power/Fertilizer Industry for affordably priced gas, while moving to a low carbon economy, after Paris Climate Change Deal. Increasing gas share in Energy basket will create a demand of 800/900 mmscmd gas annually.

Alternative & safer route to bring/swap Turkmenistan/Russian & other region's Gas to India Gujarat coast. There have been new gas discoveries in Oman/UAE/ Saudi Arabia too.

Gas Pipelines are more competitive than LNG upto a distance of 2500/3000 kms, due to high cost of gas liquefaction/transportation/re-gasification (5-6 USD / mmbtu).

Annual saving of USD one billion approx. (Rs.6000/7000 Cr.) in comparison with similar quantity LNG import.

A Reconnaissance Survey already done in 2013 by Fugro OSAE for Oman-India route.

DNV-GL, Norway / Engineers India Ltd. (EIL) / SBI Capital Markets Ltd. confirmed Project Feasibility.

GOI/MOPNG diplomatic & political support required to move Project on Fast Track.

SAGE
Middle East to India
Deepwater Gas Pipeline

South Asia Gas Enterprise
(Siddho Mal Group)
A-6, Connaught Place, New Delhi-110001
Ph: +91-11-23324245 / 43581237
E-mail: sms@siddhomalgroup.com
www.sage-india.com