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PM MODI

Receives UN's Champions of Earth Award

Prime Minister Mr. Narendra Modi received the UNEP Champions of the Earth award, UN's highest environmental honour from the UN Secretary General Mr. Antonio Guterres in New Delhi (3RD OCTOBER).

Mr. Guterres said PM Modi recognised the fact that climate change poses a direct existential threat to us. "He knows what we need to do to avoid a catastrophe. Other leaders also recognise, know and understand, but the difference is that he not only recognizes but he acts."

Mr. Modi and French President Mr. Emmanuel Macron were named as recipients of the prestigious award for their exemplary leadership and advocating action on sustainable development and climate change.

The award was conferred on the sidelines of 73rd UN General Assembly in New York City.

Expressing gratitude to the global community for conferring the award upon him, Modi had earlier dedicated it to the country and its long tradition of co-existing with nature.

Undersea Natural Gas Pipeline from Iran 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 Iran to Gujarat coast in India, through the Arabian Sea.
(A route via Oman is also being explored).

Gas Qty: 31.1 mmscmd under a 20/25 years Long-Term Gas Supply Contract with Iran.
Pipeline tariff: USD 2.5 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.

Meeting needs of Power/Fertilizer Industry for affordably priced gas, while moving to a low carbon economy, after Paris Climate Change Deal.

Alternative & safer route to bring/swap Turkmenistan/Russian & other region's Gas to India Gujarat coast.

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.

SAGE
Middle East to India Deepwater Gas Pipeline

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From the Editor

India's Energy CONUNDRUM

India's Energy sector is passing through stress, the magnitude of which is unknown and what is more worrying, is that our options to take remedial measures are shrinking.

The biggest challenge is the oil shock. India's heavy reliance on fossil fuels, especially crude oil, to meet its ever growing energy needs will continue to be a difficult conundrum for the country for at least two more decades to come if the oil demand and production projections made in the three most cited energy sector publications; International Energy Agency (IEA), Organization of Petroleum Exporting Countries (OPEC) and BP are to be believed.

The three publications on the outlook for the sector have pegged India to be the dominant driver of energy and oil demand growth up to 2040. OPEC World Oil Outlook 2040, published earlier this month, projects long-term global oil demand to increase to 117 million barrels per day (mb/d) in 2040 from 97.2 mb/d in 2017.

OPEC's report estimates India's oil demand to reach 9.9 thousand barrels of oil equivalent per day (mboe/d) in 2040, from 3.9 mboe/d in 2015. India is projected to have the fastest average demand growth of 3.7 per cent per annum and the largest additional demand of 5.8 mb/d. With this fast demand growth, India will likely pass the mark of 10 mb/d sometime towards the end of the forecast period (2015-2040).

Oil will continue to remain the second largest source of fuel for the country, with its share increasing from 23.2 per cent in 2016 to 25.2 per cent in 2040. Coal will continue to remain the largest source of energy for India through 2040, with its share increasing to 46.4 per cent in 2040 from 44.9 per cent in 2015.

BP energy outlook 2018, published in March this year, estimates global oil demand to reach around 109 mb/d by 2040 with India replacing China as the primary source of growth for oil demand. The BP report estimates India's crude oil demand to reach 485 million tonne of oil equivalent (mtoe) by 2040 from 212 mtoe in 2016.

The report estimates oil to maintain its position as the second largest source of energy through 2040 with its share reducing to 25 per cent in 2040 from 29 per cent in 2016. Coal will continue to remain the largest source of energy for India through 2040, with its share decreasing to 50 per cent in 2040 from 57 per cent in 2015.

Crude oil production estimates by BP energy outlook 2018 indicate that India's oil output will remain stagnant between now and 2040 at 1mb/d, indicating the country's increasing reliance on crude oil imports.

Sectoral News

Crude oil production estimates made by Wood Mackenzie 2040 show that India's oil output will decrease to 0.4 mb/d in 2040 from 0.7 mb/d in 2017, indicating an increase in India's crude oil imports through 2040.

The projections indicate that despite substantial gains in the country's renewable energy capacity addition and production, India will continue to grapple with heavy dependence on fossil fuels, especially crude oil and coal.

India's petrol, diesel prices are linked to international fuel prices which are impacted by the supply demand dynamics of the respective fuels but closely trail global crude oil prices. Increase in crude oil and petroleum product prices, coupled with the increase in taxes levied by the centre and state Government, have resulted in domestic fuel prices breaching record highs on most days of August and September

Renewables were our only hope. However the recent studies by several international experts indicate that India will not be able to achieve the target set for 2022.

"Even with significant cost declines, Wood Mackenzie expects about 76% of the target to be met by 2022 and this would still be a noteworthy achievement,'

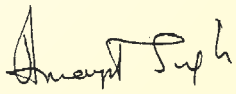
"The recent cancellation of auctions risks jeopardising investor confidence. Various duties on equipment and the associated uncertainty has led to a short- term uptick in solar prices. This leads to the knock- on effect on already cash- strapped state distribution companies who are showing an unwillingness to green light high priced Solar projects," many important players including JSW Energy have put Solar Power plants on back burner.

Nonetheless, the Government's commitment and support towards renewables remains strong. The Government has been swift and adaptable at responding to various industry hurdles and are helping reduce project risks. As a result, Renewable prices continue to remain competitive.

The good news is that- "policies to improve the power sector have started to have an impact. At the end of the financial year in March 2018, the performance of several states in reducing technical and commercial losses as well as increasing tariffs was improving. The Government is looking to de-stress some power- generating units, which may result in improvements in load factors at several plants in the short- to- medium term," it said.

India's rupee depreciating against US Dollar from an average of 63.65 to a US Dollar in January 2018 to 73.56 in the first week of October has increased the costs of imports and only the lack of domestic coal availability is forcing companies to import.

Let us keep our "Chin Up"



Amarjit Singh

Solar Alliance Will Outshine OPEC, Says PM Mr. Modi

The OPEC pumps around a third of the world's oil, and over decades has been able to influence the global energy market by controlling the price of crude.

The India-led coalition to harness solar energy will eventually replace the OPEC oil cartel, Prime Minister Mr. Narendra Modi predicted at the opening ceremony the International Solar Alliance (ISA's) first assembly.

"The role of the oil wells today will be that of the Sun's rays tomorrow," PM Modi said.

"In the coming years, when the world discusses initiatives for the welfare of humanity in the 21st century, International Solar Alliance's name will be at the top. We have prepared everyone to ensure climate justice through this ISA forum".

The International Solar Alliance, launched by Prime Minister Modi and then French president Mr. Francois Hollande in 2015 and based in India, is an Alliance of countries mostly between the Tropics of Cancer and Capricorn that receive plentiful sunshine. It aims to reduce the costs of financing solar power and the required technology, and to mobilise more than a trillion dollars to build solar facilities and infrastructure by 2030.

"The International Solar Alliance represents exactly what needs to be done and represents the future," Mr. Guterres UN Chief said at the event.

"We know what we need to do, and by large, we have the tools to do it. What we still lack, fortunately not here in this room is the political commitment to make the transformative decisions that will lead us onto a safer path," he said.

With only a single degree Celsius of warming so far, the world has seen a climate-enhanced crescendo of deadly heat waves, wild fires and floods, along with super storms swollen by rising seas.

India's population of 1.3 billion is particularly vulnerable to climate change. In August, the worst rains and floods in a century pounded Kerala, displacing 1.3 million people, with climate scientists warning that worse is to come if global warming continues unabated.

International Solar Alliance

The first assembly meeting of the Alliance, which was designated as an intergovernmental body registered with the United Nations in December 2017, will focus on the building blocks of the organisation—its governance, rules and regulations that will determine the Alliance's functioning and a work plan for the coming months.

The International Solar Alliance began as a partnership between countries, the majority of which face challenges resulting from the low rates of energy-access. Most of these countries are located between the Tropics of Cancer and Capricorn. It has now been decided to expand the membership of the Alliance to include all UN member states.

The Alliance was designed as a platform where countries can share their experiences, work together to close technological gaps, finding solutions that could be scaled up by aggregating demand that would lead to lower costs.

At the same time, the solar Alliance is more than just about energy. It is about social welfare, improving the lives of women and children, particularly young girls, who spend substantial parts of their day collecting fuel

to meet their family's energy demands for cooking, lighting a lamp or warmth. It is also about spurring economic activity. The increased deployment of solar energy will open up employment opportunities in direct and indirect ways.

India as the host country and the prime mover of the concept must focus on ensuring that Alliance emerges as a truly international body. Remaining true to its action oriented focus, ISA must ensure that solar benefits are clear, tangible and describable by users; demonstrate business models that are viable for users, suppliers and financiers; and support member countries in implementing policies to upscale adoption of these business models. The time for talk is over, ISA must now focus on delivering on its promise.

The International Solar Alliance (ISA) has received a budget approval of $9 million for the next two years. The newly elected first Director General of ISA, Mr. Upendra Tripathy, said the ISA also finalised five new programmes and two projects to be implemented in the member countries under its wing.

Mr. Tripathy said the ISA would work on two major projects- Improving Human Resources and Dissemination of information regarding ISA.

"The ISA has approved the STAR C (Solar Technology Application Resource Centre) project. The aim is to set up 121 centres, one in each presently eligible member country. These centres are being supported by the Schneider Foundation, Tata Foundation and the Phillips Foundation."

The second project approved by the ISA is the setting up of an 'Infopedia'. "The European Union has approved a grant of EUR 300,000 for it. This will act as a Common Communicator Platform, a Best Practices sharing platform and will also have a Country Counter where the nations can showcase policies to attract investment."

"The ISA has approved the Work Plan 2019 in its first meeting. Under the Work Plan, the ISA also has given its nod for five projects. These are for agricultural pumps, finance mobilisation, mini grid, rooftop solar and solar e-mobility and storage," said Mr. Tripathy.

Officials said the Centre has committed $16 million to ISA as one-time corpus and will also put $2 million every year for five years. Apart from this, the power sector publicly owned companies – NTPC Ltd. Power Grid Corporation, Power Finance Corporation, Solar Energy Corporation, Coal India, ITPO etc. have granted $9 million total to ISA. SoftBank and CLP have also committed to providing $1 million each to the ISA.

The ISA also approved the proposal to extend its membership to beyond the 121 countries that fall within the Tropic of Cancer and Tropic of Capricorn. This will allow other nations to join the ISA and gain its benefits, Mr. Tripathy added.

Indian Solar Industry Can Attract $70-80 Bn Investment: PM Mr. Modi

India wants to create a robust ecosystem for the manufacture of solar panels in the country to give a fillip to the sector which can provide opportunities for investments worth $70-80 billion, Prime Minister Mr. Narendra Modi said while. Inaugurating a joint assembly here of the International Solar Alliance (ISA), the Indian Ocean Rim Association (IORA) Renewable Energy Ministerial and Global RE-Invest 2018,

"Solar power generation costs in India have gone down hugely, while the country has become the most favourable destination for renewable energy. In the last 4 years, the sector has attracted investments worth $22 billion," he said. "We want to set up a strong ecosystem for manufacture of solar panels in the country. This area has immense opportunity available, for investment worth $70-80 billion."

Elaborating on India's strides in clean energy development during the tenure of the NDA Government, Mr. Modi said that 72 GW (GW) of renewable energy capacity had been added in this period, while solar capacity had gone up nine-fold from earlier.

"Power storage is equally important and a National Energy Storage Mission is being drawn up from the perspectives of demand creation, manufacture, innovation and augmenting storage capacity," the Prime Minister said.

He said that towards achieving the Government's target of achieving 175 GW renewable energy capacity by 2022, it is planned to install 28 lakh solar pumps across the country in the next four years which would add capacity of 10 GW.

Giving the call of "One World, One Sun, One Grid", Mr. Modi said that the "ISA will assume tomorrow the role that the OPEC (Organisation of Petroleum Exporting Countries) is playing today."

"We are moving to a future where oil wells will be replaced by the rays of the sun in meeting our energy needs," he said.

Global Solar power investments set to fall in 2018; Bloomberg

Global investment in Solar power projects fell 19 per cent in the first half of 2018 from $71.6 billion in the same period last year owing to cutbacks in China and lower equipment costs, trends that are expected to further strengthen in the second half of this year, according to research agency Bloomberg NEF.

The agency said a mixed picture for global clean energy investment in 2018 is emerging, with dollar investment in Solar under pressure while commitments to wind power and energy smart technologies such as electric vehicles and batteries are running above last year's levels.

Data compiled by BNEF showed world investment in clean energy in the first six months of 2018 stood at $138.2 billion, down just 1 per cent from the same period in 2017. The second quarter, from April to June, actually saw a rise year-on-year – of 8 per cent to $76.7 billion.

"A sectoral split for the first half of 2018 shows Solar investment down 19 per cent compared to the same period last year at $71.6 billion, with wind up 33 per cent at $57.2 billion. The slippage in Solar reflects two main developments – significantly lower capital costs for photovoltaic projects, and therefore fewer dollars spent per MW installed; and a cooling-off in China's Solar boom. These trends are set to gather pace in the second half," BNEF said in a statement.

Large Solar Power Projects!

Local Manufacturing- A Key

The Government plans to make local manufacturing of equipment a key element in tenders for large Solar power projects, even as the country aims to add close to 500 GWs of renewable energy capacity by 2030, senior officials said.

The Ministry of new and renewable energy (MNRE) plans to design the bids in a way to bring manufacturing into the country while taking care of the interest of small and medium developers, said Mr. Anand Kumar, secretary, MNRE.

"So the bigger bids will be focused on manufacturing, while smaller bids will take care of smaller developers," he told ET. "If there is one big bid and one player takes it all, that will be unfair." It would be difficult to attract manufacturers with smaller bid sizes, Kumar said.

While around 80% of the equipment used in wind power projects are manufactured locally, in the case of Solar projects about 90% of the equipment are imported and 85% of which come from China. The

cost of Solar equipment is expected to fall further after Chinese Government recently decided to put brakes on its Solar capacity addition.

The Ministry of Power, MNRE and the Central Electricity Authority (CEA) have worked out the country's installed capacity till 2030. Of the total power requirement of 862 GW, as much as 350 GW will come from Solar and another 140 GW will come from wind projects.

To reach there, the Ministry plans to bid out 30 GW Solar and 10 GW wind projects every year till 2028. Solar Energy Corporation of India earlier this year floated a global tender for setting up 5 GW manufacturing capacity linked with Inter-State Transmission System (ISTS)-connected Solar project for 10 GW aggregate capacity.

As part of the tender, developers will be allowed to import polysilicon, but will have to manufacture Solar modules locally.

Lenders Reluctant to Fund Renewables

Lenders are becoming reluctant to fund renewable energy projects in the country, prompting Power Minister R K Singh to call all stakeholders on recently to address the concerns of the sector.

Falling tariffs, power evacuation issues, and non-performing assets in the thermal power sector are among key reasons behind lenders' flinching confidence in the clean energy sector, stakeholders said.

The Government has been able to installed 71 GW renewable energy capacity in the country as against the 175 GW target set for 2022, and an investment of $100 billion would be required for installing the balance 104 GW project capacity.

"Many stakeholders, of late, have expressed concerns that Indian banking institutions are not willing to support projects in the RE sector," they say. "It is also imperative to plan the flow of capital both in terms of equity and debt in a timely manner."

Lenders are particularly bogged down by the uncertainties in the renewable energy sector, and there is a general apprehension around lending to the power sector as a whole.

"Lenders have become more conscious of lending to wind and Solar power projects," said Mr. Ashok Haldia, former Managing Director of PTC India Financial Services. "While the implementation and operational risks around projects continues, lower tariffs with those risks they believe make the debt unsustainable."

"Public sector banks are anyway not funding renewable energy projects as they are not comfortable with the new tariffs that are evolving."

Going forward the due diligence will become even more stringent and lenders may consider differential rates of lending depending on the ratings of the companies".

Falling Solar Power tariffs have become a major point of contention in the Solar industry. MNRE also recently capped Solar tariffs at Rs2.5 per unit, sending Solar power developers into a tizzy. Several developers and lending institutions alike have cautioned that capping of tariffs, especially in the face of currency risks and safeguard duty, could create non-performing assets in the renewable energy sector.

"Most of the Power Purchase Agreements (PPAs) have payment security mechanism through revolving Letter of Credit (LCs) from the off takers in lending banks, which is not being complied by the off takers. Due to which, banks also impose penalties to developers for the security non-compliance by off takers," said a spokesperson for Solar Power Developers Association (SPDA).

Trouble for Smaller Solar Players?

Edited excerpts from an Article in Economic Times

It started off as a darling of private-equity investment, generating much curiosity along the way — but ended up against a wall. The story of Solar power in India reads like a litany of woes, chief among them low tariff, wafer-thin margins, and high debt.

The initial days of Solar power in India were bright and sunny. It was pitched as the next big thing in boardrooms and investment summits. Between 2010 and 2014, everyone — from home grown small businesses to global companies to investors — was happy with the returns. The euphoria proved short-lived though, as tariff dipped to historic lows and intense competition led to unsustainably low margins.

The result was a wave of consolidation, both forced and strategic, in the highly capital-intensive business. Smaller players have been the hardest hit. They don't have access to low-cost finance that's critical for quoting low tariffs and winning Solar auctions. They also operate undiversified portfolios that cannot absorb the liquidity pressure that comes from uncertainties such as delay in payments, or the roll-out of Goods and Services Tax (GST) and safeguards duty.

Some 10 companies, such as Shapoorji Pallonji Solar Holdings, Orange Renewable, Fotowatio Renewable Ventures (FRV), Essel Energy, Skeiron Renewable Energy, Emmvee Solar, and Alex Solar, have been put on the block after their long struggle with skeletal tariffs and debt pile-up. So what took the sunshine away from smaller players?

First, the crash in prices. From the highs of INR12.16/kWh, when the National Solar Mission (NSM Batch 1) kicked off in December 2010, prices have tumbled to INR2.4/kWh in August 2018."The lowest Solar tariff was in May 2017. Tariffs have stabilised at a sub-INR3 level since then".

Mr. Ashok Khurana, DG, Association of Power Producers, says, "The game in Solar has shifted from entrepreneurs to financing. Large companies have better negotiating capacity to procure supplies and arrange finance at 300-400 basis points lower than small and medium players can. Also, the transmission cost has seen a rise of 65% in the last six years."

Mr. Rajesh Kumar Mediratta, Director, India Energy Exchange, seconds him. "Already several states are delaying payments. This will deal a death blow to the substantial foreign and domestic investment flowing into this sector. If payments are not made on time, we are staring at another NPA (non-performing assets) crisis," he says.

Then there's the confusion over the safeguard duty, and the increased project cost due to a depreciating rupee.

Small companies are facing difficulties in raising funds, which is keeping them away from Government power-project auctions, restricting their growth and crippling their ability to refinance loans. The larger players are, however, sustaining their business with diversified portfolios. They are also looking to raise capital through listing in public markets. Most of the big renewable-energy developers in India are funded by Private-Equity (PE) money. PE investors typically look for an exit after five to seven years, mostly moving out when the stock market is at a high.

Project developers have in the past expressed their concerns with the tender, stating that it forces them to enter manufacturing business, which is not part of their core competency. Companies can bid for minimum 2,000 MW PPA, pursuant to which 600 MW solar manufacturing capacity must be set up.

Companies are also worried about the cancellation of power purchase agreements, the executive said. SECI recently cancelled solar bids received from ReNew Power, SoftBank, among other large players, on the grounds that the prices quoted by the developers were too high.

77,000 MW Solar Capacity Addition

India to Invest Rs3.85 lakh crore

India is likely to invest Rs385,000 crore for setting up 77,000 MW of Solar power generation capacity by 2022, Power and New and Renewable Energy Minister Mr. R K Singh said recently.

The Government has set a target of installing 100,000 MW of Solar power capacity by 2022. Solar projects with aggregate capacity of 23,120 MW have been installed up to July 2018.

"For installation of remaining around 77,000 MW, an estimated investment of Rs3,85,000 crore at Rs5 crore per MW is required," the Minister said in a written reply in Parliament, adding most of the investment in this sector comes from the private sector.

The private sector has invested around Rs115,600 crore so far in setting up the 23,000 MW operational Solar capacity, at a rate of Rs5 crore per MW. The total installed capacity of Solar projects created in the country during the last three years stands at 22,389 MW.

Among the states, Andhra Pradesh has set up the largest base of Solar capacity in the current financial year (2018-19) at 369.9 MW followed by Tamil Nadu with 312.38 MW. Data shows 13 Indian states have not set up any Solar capacity this fiscal.

India may not reach 100GW Solar Power target by 2022: CRISIL

CRISIL
An S&P Global Company

India will find it difficult to achieve its ambitious target of generating 100GW Solar power by 2022, ratings agency CRISIL said. In a report, CRISIL's industry research arm said that in the best-case scenario, the country will touch 78-80 GW, against the current capacity of 21.65 GW.

CRISIL expects an additional 56-58GW of Solar capacity addition between fiscals 2019 and 2023. While this is a vast improvement from the 20GW added during 2014-18, it still falls short of the National Solar Mission target by a fifth. A safeguard duty on Solar modules from China and Malaysia, which took effect this month and will continue for two years, is expected to slow capacity addition.

"We are more confident that projects with the Solar Energy Corp. of India (SECI) will be executed faster; their projects are better able to deal with evacuation concerns (i.e. connection to the national grid)," said Mr. Rahul Prithiani, Director, CRISIL Research in an interview.

Wind Power Industry hit by Discom Turbulence

Power producers allege pressure from State utilities to re-negotiate PPAs, delayed payments, lack of open access.

The country's wind power sector is facing with turbulence, with alleged arm twisting by several State discoms over renegotiation of PPAs, lack of open access for inter-State transmission, and delayed payments by discoms, all leading to financial concerns raising bankability issues.

This, in turn, has resulted in lenders turning cautious over funding new projects, as the outcome may not be as projected, according to several players in the sector.

A recent Bombay High Court decision provides some relief for projects in Maharashtra but there are a number of systemic issues that need to be addressed if the sector has to grow unhindered, say industry observers.

India's Renewable Energy Capacity to Reach 140 GW by 2023: CRISIL

The government is planning to ramp up the country's green energy capacity base to 175 GW by 2022 from the current 72

India's renewable energy generation capacity is expected to reach 140 GW by 2022-23 and solar power would account for around a half of this followed by wind energy with 40 per cent, research and ratings agency CRISIL said in a report.

The government is planning to ramp up the country's green energy capacity base to 175 GW by 2022 from the current 72 GW.

"Continued government thrust, expected drop in levelised cost of energy, and economical tariffs compared with conventional sources are expected to benefit the renewable energy juggernaut," the report said.

It added that government's global commitment to reduce carbon emissions and availability of foreign funding at attractive rates would also support the growth of the renewable energy sector.

According to CRISIL, the installed capacity of renewable energy sector has witnessed a Compound Annual Growth Rate (CAGR) of 18.5 per cent between 2013-14 and 2017-18.

"Major traction was observed in solar power, whose installed capacity grew at a breakneck speed to 22 GW in financial year 2017-18 – over eight times compared with financial year 2013-14," the ratings agency said.

Oil Output Drops 3.3% in April-August

Slump since 2011-12 has Pushed up Import Dependence in 6 years to 83.2%

Domestic oil production has contracted this year, increasing the country's dependence on imports and making it more vulnerable to soaring crude prices.

Local output declined 3.3% from a year earlier to 14.6 million metric tonnes in the April-August period this year, raising dependence on imports for 83.2% of thecountry's oil requirement.

India's domestic crude oil output has stagnated or declined for more than seven years because of lower production from ageing fields, suboptimal oilfield management and policy issues. A straight decline since 2011-12 has pushed up country's import dependence in six years to 83.2% from 75.6%.

India paid $88 billion for importing crude in 2017-18. Having already spent $49 billion on oil imports in the April-August period, Indian refiners are set to fork out much more this year with crude touching $85 a barrel.

A battered rupee, past the record 74-level to a dollar, is making matters worse for fuel consumers. Record prices of petrol and diesel have triggered price control and duty cut by the government. PM Modi set a 10% import reduction target in March 2015, the government launched a new exploration licensing policy, auctioned new blocks, introduced higher economic incentives for biofuel production, and pushed harder for biofuel blending in petrol and diesel. But these measures have been inadequate in raising local crude output or cutting import in the short term.

In the first round of auction under the new exploration licensing policy, only a handful of private players participated and foreign companies kept out. Just one company, Vedanta, won 41 of the 55 blocks offered while ONGC own two.

Regional Petro Co-operation

Edited excerpts from Minister's Recent Address

"Regional integration through connectivity across all modes - physical, utilities-based and digital - among our countries in the immediate neighbourhood is one of the top priorities of our Government. It is imperative that we, together as a group, address the weak links and overcome challenges," Mr Pradhan.

Myanmar- India is planning to set up a Liquefied Natural Gas (LNG) import terminal in Myanmar as it looks to expand energy diplomacy in its neighbourhood, The terminal to import super-cooled natural gas will be in addition to the similar facilities planned by Indian firms in Bangladesh and Sri Lanka as part of larger plan of energy connectivity in the South Asian neighbourhood. "The Hydrocarbon Vision 2030 for North East India envisages a natural gas pipeline from Numaligarh towards Sittwe (in Myanmar) in different phases. The gas pipeline will open future possibilities of gas exchange and grid connectivity," he said.

"Bangladesh- "India is working with Bangladesh in interconnecting gas grids and supplying diesel through pipelines," he said. Currently, Indian firms supply diesel through rail rake from Siliguri in Assam to Parbatipur in Bangladesh and are in the process of constructing a 130-km long product pipeline for uninterrupted supply.

Indian companies are also working on connecting India's gas grid with that of Bangladesh and supply

gas for power generation at Khulna Power Plant," he said. "This will be an exemplary display of regional cooperation."

Mr. Pradhan said Petronet is also looking at building a 7.5 million tonne a year LNG import terminal in Bangladesh to feed that country's energy needs using imported gas."In view of providing energy access to the north-eastern part of India, there are plans to import LPG in Bangladesh and transport through road/pipeline to the region while catering to the demand of Bangladesh.

Sri Lanka, India is jointly developing Trincomalee oil storage tank farm and is also working on setting up an LNG terminal and a 500 MW LNG-fired power plant near Colombo.Also, there is a proposal to develop City Gas Distribution (CGD) and CNG market and infrastructure in Sri Lanka, he said. IOC Lanka, which is a subsidiary of IOC, has 43.5 per cent of the total fuel market share.

"India is working with Sri Lanka on a proposal to set up a solar power plant at Sampur, which would be of 50 MW to begin with," he said.

Nepal, India presently supplies all of its petroleum product requirements through trucks. A pipeline for supply of petroleum products is under construction, which will ensure uninterrupted supply.

"There are also discussions with Nepal on an LPG and Natural gas pipeline," he said adding Nepal has expressed interest in implementing free cooking gas (LPG) connection scheme for poor women on lines of the Pradhan Mantri Ujjwala Yojna (PMUY) to expand the coverage of LPG.

Bhutan, India supplies all of petroleum product needs of Bhutan, which too is planning to extend LPG coverage to 100 per cent of the population by sourcing supplies from the refineries in Assam, he said.

India supplies to **Mauritius** all its energy products. "Our (neighbouring) countries are considering the construction of a bunkering facility along with a jetty," he said adding Indian firms are working with Vietnam, the UAE and Oman for presence in upstream sector to produce oil and gas.

Bangladesh and Myanmar have large gas reserves which can be explored as alternate sources of gas supply. Similarly, Nepal and Bhutan have immense potential of hydropower, which is untapped due to the absence of a market that can create demand of this magnitude. On the other hand, India and Sri Lanka are net importers of energy like many other developing countries.

"The energy demand-supply sectors in Bangladesh, India, Myanmar, Sri Lanka, Thailand, Nepal and Bhutan offer a potential for regional resource cooperation, which could go beyond export-import trade relations and link the region in a Bay of Bengal Energy Community and thus contribute to the process of regional integration.

"The key to developing such a community lies in identifying complementary conditions and the combination of inter related production characteristics among energy supply and demand sectors of these countries," he said.

Mr. Pradhan called for reform and restructuring of the energy sector in each of these nations in such a way that the bloc becomes more competitive and efficient.

The national energy systems -- gas and electricity networks -- in the South Asian countries are largely isolated from each other. Currently only India, Bhutan and Nepal trade electricity. In addition, India supplies some amount of power to Bangladesh.

Demand for electricity in South Asia and particularly in Bangladesh, Bhutan, India and Nepal is growing rapidly which call for cooperation and trade that should eventually create one of the world's largest integrated energy market.

Discovered Small Fields (DSF)

India recently put up for bidding 25 discovered oil and gas fields, holding resources of an estimated Rs1 lakh crore, as it looked to expedite production from areas lying idle for years.

Oil Minister Mr. Dharmendra Pradhan launching the second round of Discovered Small Fields (DSF) said the Government is expecting as much as Rs45,000 crore in royalty, taxes and profit petroleum over the life of the fields.

In DSF-II, 59 discoveries have been clubbed into 25 contract areas spread over 3,042 square kilometres and eight sedimentary basins. The last date of bidding is December 18 and contracts will be awarded within January 2019.

"In the DSF-I round, Rs34,600 crore of resources were bid out. In DSF-II, fields holding Rs1 lakh crore of hydrocarbon resources are being offered," he said.

Mr. Pradhan said the Government is expecting a revenue of Rs9,000 crore from fields bid out in DSF-I, with first oil expected in 2020. Also, DSF-II would generate 85,000 jobs, he said.

V P Joy, Director General of the Hydrocarbons (DGH) said the main features of DSF-II include a single licence for exploitation of both conventional and unconventional hydrocarbon, prior technical experience not a pre-qualification criterion, no upfront signature bonus and full pricing and marketing freedom. "Royalty rates have been reduced 7.5 per cent from 10 per cent for offshore blocks," he said.

The Government had in 2016 brought a new DSF policy, offering "idle" small discovered fields of state-owned Oil and Natural Gas Corp (ONGC) and Oil India Ltd (OIL) in an auction on liberalised terms including marketing and pricing freedom and lower taxes.

In DSF-II, the fields on offer hold 190 million tonnes or 1.39 billion barrels of oil and oil equivalent in place gas reserves. On offer are 15 onland fields and 10 shallow water areas.

Vedanta Wins Exploration Licence for 41 Blocks

Vedanta has won exploration licenses for 41 of the 55 oil and gas blocks auctioned in the first round of the open acreage licensing policy, with state-run Oil and Natural Gas Corp winning barely two.

Oil India, managed to win nine blocks while GAIL, Bharat Petro Sources and Hindustan Oil Exploration (HOEC) won one block each.

Vedanta initially toyed with the idea of seeking just 10 exploration licences but eventually placed bids for all 55 blocks on offer. It won 3/4th of the blocks, which is a spectacular success ratio.

ONGC, the most experienced oil and gas player in the country, had placed bids for 37 blocks but won just two. ONGC's risk aversion resulted in conservative bids.

The auction was the first test of the new Hydrocarbon Exploration Licensing Policy (HELP), which gave companies the liberty to carve their own blocks, introduced revenue-sharing model and gave operators the freedom to market natural gas.

Under the policy, companies can express interest in specific blocks round the year. The Government aggregates these interests over six months and then put these blocks up for auction. These oilfield auction are important for India to raise its domestic output of oil and gas, and cut its dependence on imports. India currently imports nearly 84% of crude and nearly half of its natural gas requirement. The Government has set a target of cutting oil imports to 67% of India's requirement by 2012.

Oil prices poised for further Hike: IEA

Petrol and diesel prices, already hovering near record levels, are poised to soar further as the head of the International Energy Agency sees robust global demand rapidly outpacing dwindling supply, boosting crude rates.

Indian economy remains vulnerable to oil price fluctuations, which makes it important for the country to diversify sources of supply, use biofuels, and to reduce energy consumption by cars, trucks and factories, Mr. Fatih Birol, executive Director of Paris-based IEA, told ET in an interview.

Diesel prices rose to a record high this week, while petrol is close to its highest-ever level and the steep depreciation of the Indian rupee has not helped. The rupee has fallen 10% this year hit a record low of Rs70.82 on Thursday. India imports about 80% of the oil it consumes, which means petrol and diesel would be about Rs6 per litre cheaper had the rupee held steady this year.

"The coming few months are difficult months. The global oil demand growth is much stronger than the historical averages, led by China, India among other countries. But when we look at the supply side, we see a big problem of Venezuela oil production declining sharply. There's a free fall," Mr. Birol said.

"If the OPEC alliance countries don't increase their production significantly in the next months to come, we may see tightening of the global oil markets towards the end of this year. This may well put a pressure on the prices. It is already at $75 per barrel today," he added.

Brent prices have been firming up on account of lower output in Venezuela and US sanctions that restrict crude oil export from Iran, the third-largest OPEC producer.

GAIL Eyes New Geographies

A diversified supply base, the lure of fat margin, and the confidence earned with some recent overseas deals have boosted ambition of GAIL, which is now preparing to up its game in the international trade.

GAIL's gas marketing portfolio, including the locally-produced gas, is set to expand to 97 Million Metric Standard Cubic Meter a Day (MMSCMD) in 2018-19 from 86 MMSCMD in 2017-18, aided by overseas LNG supply. Of the 97 MMSCMD, locally-produced gas comprises about 51MMSCMD. Nearly a quarter of the balance 46 MMSCMD of LNG supply has been tied up for sale to international customers with the remainder planned to be shipped to India.

"Our focus is now to reach new geographies. A diverse supply base enables us today to serve customers in diverse regions," said Mr. Singh, adding that the shift would help mitigate risk that comes with total dependence on the domestic market.

Indian Oil to invest Rs1.75 lakh cr for expansion: Mr. Sanjiv Singh

Indian Oil Corp, the nation's largest oil firm, plans to invest Rs1.75 lakh crore to nearly double refinery capacity, boost petrochemical production, expand gas business and lay new pipelines to become a vertically integrated company, its Chairman Mr. Sanjiv Singh said.

It plans to raise capacity to turn crude oil into fuels like petrol and diesel to 150 million tonnes per annum by 2030 from the current 80.7 million tonnes. The

company currently owns and operates 11 out of the 23 oil refineries in the country.

"As the leading refiner in the country and a dominant player across a diverse portfolio of offerings in energy, IOC is focussing on all emerging opportunities for organic and inorganic growth through vertical integration and strategic diversification, besides pursuing value-creating research areas," Mr. Singh said in the company's latest annual report.

Mr. Singh said plans to nearly double refining capacity by 2030 include "greenfield refineries of subsidiary Chennai Petroleum Corp Ltd (CPCL) and the proposed Ratnagiri Refinery & Petrochemicals Ltd (RRPCL), apart from numerous brownfield expansions."

"Several pipeline projects with a combined capital expenditure of over Rs20,000 crore are under implementation. Upon completion, IOC's pipeline network would expand to about 20,000 km in length," he said, adding a 69-km pipeline is also being laid to transport petroleum products to Nepal.

Oil India's Crude Production up 3.5%

Oil India Ltd (OIL) has reported a 3.57 per cent rise in crude oil production at 3.4 million tonnes (mt) in FY18, against 3.3 mt in FY17.

"OIL achieved natural gas production of 2,905 MMSCM from the Assam, Arunachal Pradesh and Rajasthan fields (inclusive of 23 MMSCM as OIL's share from the Dirok JV, which started production in August 2017)," said the company's Chairman and Managing Director Mr. Utpal Bora said at its 59th AGM.

The gas production potential decreased in a few high producing wells due to down hole Problems, which led to a marginal decrease in annual gas production, he added. Bora also said a significant development has been the production of heavy oil through the chemical stimulation process from Rajasthan's Baghewala field.

Giving an overview of the company's activities, Bora said OIL had carried out 2D and 3D seismic surveys to identify new prospects in the Petroleum Mining Lease (PML) and New Exploration Licensing Policy (NELP) blocks.

OIL also made four hydrocarbon discoveries in the Upper Assam basin, at Lakwagaon, South Baghjan, South Chandmari and Hukanguri, and established the first commercial oil production from a new formation in Upper Assam basin.

City Gas Distribution Tenth Round of Licensing soon

The tenth licensing round for city gas distribution will be launched in a couple of months to cover 50 districts, according to the chief of downstream regulator, which has just concluded the mega ninth round that auctioned permits for 174 districts.

Mr D K Sarraf chairman, PNGRB said recently. "I think there is appetite among investors to take more. Many investors didn't get as many GAs (Geographical Areas) as they expected. They may come forward to commit more investment on immediate basis".

The tenth round is being planned to include places within 100 km of gas pipelines and to cover highways so that inter-city travel by natural gas-driven cars becomes a reality, said Mr. Sarraf.

Besides the tenth round of auction, PNGRB is also preparing regulations for common access to more than a dozen city gas licence areas whose marketing exclusivity has expired, Mr. Sarraf said.

PNGRB is putting in place a robust system to monitor licensees' project implementation, and plans to coordinate with state Governments and other agencies such as municipal corporations, railways and highway authority to help companies resolve problems on the ground.

"Many of the challenges are common to all companies. So we are urging them to come together to set up a centre of excellence," Mr. Sarraf said.

HPCL on Expansion Drive

Hindustan Petroleum Corporation Ltd (HPCL), is on a major expansion-cum-consolidation drive that involves a Rs60,000-crore capital expenditure plan. The amount is likely to increase by about Rs15,000 crore if some other projects under consideration are included.

Mr. J Ramaswamy, the company's Director - Finance, said: "The investment is three-pronged — it will lead to huge capacity expansion, augmenting BS VI compliant fuels, bottom up gradation and consolidation at the existing refining and processing facilities, and a greenfield project."

In addition to this, investments in pipeline projects and upcoming ventures are under various stages of consideration. HPCL is making significant investments in the production of BS VI fuels, which will become mandatory on April 1, 2020.

"The Vizag refinery complex will see a total investment outlay of Rs21,000 crore, which will see the expansion of the refinery from 8.3 mtpa to 15 mtpa," said Mr. Ramaswamy, adding that it will also cover the production of BS VI fuels and bottom upgradation.

While the Mumbai refinery will see an investment of about Rs5,000 crore, where the capacity will be increased from 7.5 mtpa to 9.5 mtpa, the joint venture greenfield refinery planned at Barmer in Rajasthan will see the setting up of a 9 million-tonne integrated refinery and petroleum complex.

The Barmer project, expected to see an outlay of over Rs43,000 crore, has most of the clearances in place. Referring to another project planned in Gujarat, where an LNG terminal will be set up at an outlay of Rs4,000 crore, Ramaswamy said: "This project is being taken up through a 50:50 joint venture with the Shapoorji Pallonji Group."

Is OPEC's end in sight?

OPEC is losing its relevance. Though its ranks have swelled in each of the last three years, its new members have done little to bolster its production potential. But just like that ball of gas in space, no external agency is required to bring about the end of OPEC.

The world has changed. OPEC is no longer relevant in the way it once was. Though the group has never had more members in its 58 years of existence, the volume of crude it produces represents just a third of all the oil extracted in the world — the smallest share it has commanded in almost three decades.

The group's ability to influence oil prices by either boosting or cutting output has also waned. Spare capacity available to lift production at short notice has become increasingly concentrated in the hands of a dwindling band of Persian Gulf Arab countries.

The inclusion of Russia in the group's latest supply management push reflects its waning power. Alone, it was both unwilling and unable to agree to remove sufficient volumes of oil from the market in 2016 to balance supply and demand. But Russia made all the difference. Now that OPEC needs to boost output, its lack of power becomes even more obvious. Only a small group of countries led by Saudi Arabia have the ability to lift production.

Internally, the political and economic differences between OPEC's founding members now outweigh the common ground that brought them together in 1960.

The fall in Iranian supply as a result of Trump's sanctions means that overall production by the OPEC+ group is once again falling below the level agreed in 2016. Having decided in June that they should strive to bring overall compliance back to 100 per cent, Saudi Arabia and Russia will argue that those who can lift production should do so. And who can do this most quickly? Saudi Arabia and Russia.

Oil Economy Needs Reform

The recent studies by IEA, OPEC & BP Suggest that Dependence on Fossil Fuels will pose huge challenges. The projections indicate that despite substantial gains in the country's renewable energy capacity addition and production, India will continue to grapple with heavy dependence on fossil fuels, especially crude oil and coal.

India's heavy reliance on fossil fuels, especially crude oil, to meet its every growing energy needs will continue to be a difficult conundrum for the country for at least two more decades to come if the oil demand and production projections made in the three most cited energy sector publications by International Energy Agency (IEA), Organization of Petroleum Exporting Countries (OPEC) and BP are to be believed.

The three publications on the outlook for the sector have pegged India to be the dominant driver of energy and oil demand growth up to 2040.

OPEC World Oil Outlook 2040, published earlier this month, projects long-term global oil demand to increase to 117 million barrels per day (mb/d) in 2040 from 97.2 mb/d in 2017. OPEC's report estimates India's oil demand to reach 9.9 thousand barrel of oil equivalent per day (mboe/d) in 2040, from 3.9 mboe/d in 2015.

India is projected to have the fastest average demand growth of 3.7 per cent per annum and the largest additional demand of 5.8 mb/d. With this fast demand growth, India will likely pass the mark of 10 mb/d sometime towards the end of the forecast period (2015-2040).

Crude oil production estimates made by WOO 2040 show that India's oil output will decrease to 0.4 mb/d in 2040 from 0.7 mb/d in 2017, indicating an increase in India's crude oil imports through 2040.

The BP report estimates India's crude oil demand to reach 485 million tonne of oil equivalent (mtoe) by 2040 from 212 mtoe in 2016. The report estimates oil to maintain its position as the second largest source of energy through 2040 with its share reducing to 25 per cent in 2040 from 29 per cent in 2016. Coal will continue to remain the largest source of energy for India through 2040, with its share decreasing to 50 per cent in 2040 from 57 per cent in 2015.

Crude oil production estimates by BP energy outlook 2018 indicate that India's oil output will remain stagnant between now and 2040 at 1mb/d, indicating the country's increasing reliance on crude oil imports.

Electric Vehicles in Focus

With an aim to promote eco-friendly vehicles, the Government had launched the FAME India scheme in 2015. The on-going pilot phase of the scheme was earlier extended till September this year or until its second phase is approved.

India unveiled its National Electric Mobility Mission Plan in 2013 but it has since gone slow on its targets as the Government realised the need for adequate infrastructure. Lack of charging stations is a key factor behind the delay in deployment of electric vehicles procured by state-run Energy Efficiency Services Ltd, a joint venture between NTPC Ltd, Power Finance Corp. Ltd, Rural Electrification Corp. Ltd and Power Grid Corp. of India Ltd. The procurement is to be done for 10,000 EVs in two phases.

Prime Minister Mr. Narendra Modi launched the second phase of the FAME India scheme offering incentives for mass adoption of electric vehicles with an outlay of Rs5,500 crore. This phase of the scheme spanning five years will offer subsidy to all categories of electric vehicles, including two-wheelers, three-wheelers and four- wheelers including taxis and electric buses used in public transportation, to promote green vehicles and check pollution. It will also envisage setting up massive charging infrastructure to support electric vehicles, senior officials said.

The Union Government plans to provide Rs1,000 crore as subsidy for building a nationwide charging infrastructure for electric vehicles as it seeks to expedite the roll-out of India's ambitious EV programme, said two people aware of the development on condition of anonymity.

The Ministry of Heavy Industries (MHI) is drafting a cabinet note on the ways and means to set up the infrastructure as the Government seeks to allay consumer concerns on how to charge such vehicles especially on cross-country highways. According to the draft, the Government plans to have 1,000 charging stations across the country especially on major highways such as Delhi-Chandigarh, Delhi-Mumbai, and Mumbai-Surat-Pune stretch.

A charging station will be installed at every 25km on these highways, according to the note prepared by the Department of Heavy Industry. There will be additional focus on cities with population exceeding 4 million.

"Incentives will be provided on purchase of two-wheelers as well as three-wheelers and four-wheelers including taxis and electric buses used in public transport to check pollution. However, strong hybrid vehicles will not be entitled to sops anymore."

Under the scheme, depending on technology, battery-operated scooters and motorcycles are eligible for incentives ranging between Rs1,800 to Rs29,000, while in three-wheelers it is between Rs3,300 and Rs61,000.

Electric Mobility

Vital For Energy Transformation

Mr. Amitabh Kant, NITI Aayog

The country needs energy transformation and we need to look at four objectives -- access to energy at rational prices, improved security and independence, greater sustainability and economic growth.

Our energy imports are pre-dominantly fossil fuel-based and there is a huge need for reduction in imports and emissions. It is very clear that we can do this only by pushing consumption of renewables. The country needs to lay a huge focus on renewables. This is the way the world is going too.

India has a great ability to get into sunset industries rather than sunrise industries and the future belongs

to only two things and the country needs to put its entire scientific community behind two aspects -- storage and batteries. Without storage and batteries India has no future.

Secondly, the future lies in electric mobility. Globally and if India is able to take the lead in these two things it will take lead globally. In every other sector, we have got in too late in the game but in these two sectors we are exactly where the world is.

If we are able to make technological breakthroughs in the areas of storage and batteries, if we can make a massive break-through in electric mobility, India will leap-frog the world.

Also, if you look at these areas, India does not have legacy issues. Unlike America where you have 985 cars per 1000 people and Europe where you have 886 per 1000 people, India has only 20 cars per 1000 people and yet we have 14 of the most polluting cities in India.

Whether you like it or not we owe it to the citizens to clean up our cities and if we need to clean up these cities we need to move away from a fossil fuel-based economy to a renewable-based economy.

India is a different economy because in India unlike the rest of the world 70 per cent of our vehicles are two-wheelers, 67 per cent of the energy consumed are by two-wheelers, 30 per cent of the emissions are by two-wheelers and therefore the first and foremost challenge is to link batteries with two-wheelers. We currently do not have adequate research in this regard.

The challenge is not electric mobility in four-wheelers. It is two-wheelers and we need to find a solution to providing batteries to two-wheelers. If we are able to do retro-fitting in our two-wheelers it will be a massive break-through.

The future will be not about purchase of vehicles but about per kilometre usage of vehicles and this transformation will happen much quicker.

"We recently did a study with Rocky mountain institute which said that irrespective of the fact that we import lithium, nickel and cobalt, almost 85 to 86 per cent of value addition can be done in India". There is a huge potential among young people and oil companies to foray into batteries.

The second key challenge is in three-wheelers. Around 10 per cent of total vehicles are three-wheelers and they contribute a very substantial amount of pollution in India, about 30 per cent. In this segment, there is a huge possibility today in storage batteries as well as swapping batteries. Work in being done in this segment but we need to push the limit on this.

Focus needs to be on public transportation, inter-city as well as from city-to-city. Almost 78 per cent of the goods are moved by Lorries and railways transports only 22 per cent of the goods. Buses and Lorries within the city require CNG and for city-to-city needs we need LNG. Work needs to be done for using CNG within the city and LNG for travelling city-to-city, which is not being done.

The Rocky Mountain study show that India has the potential to set-up 20 Gigafactories in India. Why are none of our oil companies thinking along these lines -- 20 Gigafactories for batteries and energy storage?

The future belongs to storage and batteries and both the world of energy and transportation converge at the point of storage. That is where the future of India lies.

'FAME II Subsidy Not Enough- TERI

Tata Energy Research Institute (TERI) director general Dr Ajay Mathur recently said that under the FAME I round of bidding, a price of below Rs60 for a kilometre of travel by electric bus has been discovered, which proves to be

economically viable. But the government is yet to work out the cost of full transition — from fuel-run vehicles to electric vehicles — and that remains an issue.

The first phase of FAME bidding has been on the basis of own and operates. An inter-ministerial group has finalised the second phase of FAME with an estimated investment of Rs5,500 crore over the next five years to provide subsidies to all types of electric vehicles including two-three- and four-wheelers in order to promote green vehicles and check pollution.

Phase 2 of FAME envisages to cover a wider range of EVs providing subsidies in the range of Rs1,800-29,000 for battery operated scooters and motorcycles. For three-wheelers, the incentives will range from Rs3,300 to Rs61,000.

Destressing Power Sector

Power Finance Corp (PFC), has initiated resolution proceedings against defaulting power projects as per a Reserve Bank of India circular and has received bids for some of those where change of management is being envisaged. However, the deadline of August 27 to conclude the resolution process appears to be challenging, PFC Chairman Mr. Rajeev Sharma said recently. Edited excerpts.

The RBI circular of February is currently not applicable to NBFCs like PFC. However, since PFC is a consortium partner with banks in projects, PFC has adopted the circular as a matter of prudence. Accordingly, six loan accounts have been classified as NPAs in quarter four of FY17-18, amounting to Rs12,000 crore.

PFC is presently working out resolution options provided under the RBI circular, including change of ownership in six projects, restructuring of debt in five projects, while nine projects are being taken up for resolution through NCLT under IBC.

Samadhan and Pariwartan Schemes- Resolution plans for power projects vary from one project to the other. So, it is not a 'one solution fitting every problem' kind of approach. Some projects may have to be resolved through Samadhan, some through Pariwartan and for some projects other options might have to be explored. For example, in case of one transmission project and one generation project, we are exploring with the state governments to take over the projects. We are also exploring one-time settlement opportunities in some other projects.

As part of restructuring of debt or a resolution plan, PFC or lenders would be looking at converting part of the unsustainable debt into equity and other equity-like instruments.

"We are giving increased focus to diversify our borrowings and have raised around 14% of total borrowing in FY 2017-18 in foreign currency by way of syndicated loan, bonds, FCNR(B), etc., and target to raise even higher proportion of total borrowing from external markets this year".

Railway Electrification to Double Power Demand - A Study

100% railway electrification will increase power demand for broad gauge from 2,000 MW to 3,400 MW, while the two dedicated freight corridors will require another 600MW

With the union cabinet approving the complete electrification of broad-gauge railway tracks by 2022, power demand by Indian Railways is set to double in the next four years. The power requirement for broad gauge will increase from 2,000 megawatts (MW) to 3,400MW, while the two dedicated freight corridors will require another 600MW, according to a railway official, requesting anonymity.

Power will be procured by Railway Energy

Management Co. Ltd (REMCL), a joint venture of the Indian Railways and RITES Ltd. Set up in 2013, REMCL is primarily responsible for tapping the business potential of the energy sector. It currently caters to 60% of railways' power needs.

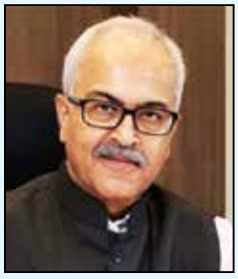
"As per our estimates, broad-gauge electrification will increase power demand from present 2,000MW to 3,400MW. The 2,000MW is only for train operations and if we add non-traction consumption like use of electricity at workshops, railway stations, offices, etc., we will need to add another 400MW," said a senior railway official mentioned above.

"Railways will be exploring long-term power purchase agreements given that higher demand will increase tariffs by 25-30 paise per unit. Besides, we may also set up more independent power plants or joint ventures, too." Railways will look to procure power through open access.

Indian Railways is one of the largest railway networks in the world with 67,368 km of tracks and 22,550 trains, which carry 22.24 million passengers and 3.04 million tonnes of freight every day. At present, the railways consume 18.5 billion units of electricity every year. Out of this 16 billion units is for running trains, while the remaining 2.5 billion units are for running other utilities such as railway stations, workshops and railways offices.

Power Sector

Edited excerpts from an Interview by Mr Ajay Bhalla, Secretary Power



Saubhagya when we launched last year, our assessment for unelectrified houses was 4 crore. But when the detailed project reports were prepared, the number came down to 3.5 crore. We have just energised so far. All states have started work in full swing. There were issues of monsoon in some places and floods in Odisha and Assam which stalled work for some time, but in the remaining months up to December, we expect this target to be definitely achieved. A few days back we achieved electrification of 1.12 lakh houses in a day. For what we are targeting we need to go up to 1.5 lakh houses per day and maybe at some point of time 2 lakh households per day.

Shortages in Coal supplies have increased over last year. We are concerned that the stocks have not built up, especially in power plants located away from the pithead. We are meeting ministries of railways and coal regularly, and trying to resolve some constraints.

Achieving Power For All

Transmission A Key!

The Government of India's focus on achieving Power for all has boosted capacity addition nationwide. According to a recent study, India ranks third among 40 countries in EY's Renewable Energy Country Attractiveness Index.

An investment of approximately Rs2,600 billion is envisaged by both the central and state Governments for strengthening the transmission system during the next five years. In addition to this, the plan of 175,000 MW of renewable capacity addition by 2022 and its evacuation will provide more opportunities for growth.

Similarly, opportunities to reform last-mile delivery to customers and improve the distribution segment by means of technology and a digitalisation interface aimed at providing efficient and cost-effective services to end consumers is likely to give players like us tremendous opportunities in the times ahead.

Upgrading Power Projects Huge Opportunity: GE

New capacity addition in India's thermal power sector may be hurt by the problems in the beleaguered sector but there is a huge opportunity in upgrading existing projects, which could

potentially lead to savings of $3 billion in power bills and reduce emissions, Mr. Andrew DeLeone, Managing Director of engineering major GE's India power business.

The Indian thermal power sector has been crippled by a lack of power purchase agreements, which has rendered projects stranded, many other power units are running below capacity and some are facing delays in payments. Private sector companies are reeling under heavy debt and while the Government has taken measures to revive the health of state-run power distribution companies, industry players don't see recovery in the foreseeable future.

"We feel India will see around 6-8 GW of new thermal power capacity every year but there is 70-80 GW of capacity that can be upgraded for efficiency and flexibility, this may happen over the next five years. This upgrade can save the country more than $3 billion dollars in power bills and at the same time reduce carbon emission," Mr. DeLeone said.

Energy Efficiency

A Success Story

"The systematic efforts by adopting energy conservation measures by 400 industries coupled with technology upgradation have resulted in energy savings worth Rs9,500 crores annually," the Ministry said.

These achievements were reported by the power Ministry based on an impact analysis report for Perform, Achieve and Trade (PAT), the flagship scheme under the National Mission for Enhanced Energy Efficiency (NMEEE) being implemented by Bureau of Energy Efficiency (BEE).

The main industry sectors where energy savings were evaluated included thermal power plants, fertilizer, chlor alkali, aluminium, iron and steel, pulp and paper, textile and cement.

The Ministry said these industries adopted technologies such as waste heat recovery, Top Recovery Turbine, Coke Dry Quenching and compressor optimization for improving their specific energy consumption.

The Ministry also released the outcome report for the study of the PAT scheme conducted by BEE which demonstrated energy savings of 8.67 Million Tonnes of Oil Equivalent (MTOE) against the target of 6.686 MTOE.

The implementation of the scheme resulted in investment of around Rs26,000 crore by the industry and reduction in 31 million tonne of Carbon Dioxide annually.

Green Transmission Corridors

Mr. IS Jha

At least 60,000 MW needed by 2022 to meet Centre's 100-GW Solar target: Power Grid Corporation of India Limited (PGCIL) expects a market opportunity of Rs50,000 crore for setting up Green Energy Evacuation Corridors in India by 2022.

"The immediate requirement from the transmission sector is to meet the demand from the renewable energy sector. But after another two years, there will be a rise in generation from conventional sectors and consequently, more demand for the transmissions sector," Mr. Jha added.

PGCIL is the dominant power transmission player in India. Currently it has a market share of 98 per cent. Mr. Jha said: "The projects nominated to PGCIL by the Centre are those which the private companies do not go for. PGCIL builds and competes for projects at the most competitive rate, driven by cheaper financing costs and operational expertise."

"Managing growth and consolidation will remain our top priority"

Mr. Anil Sardana

Mr Anil Sardana, MD& CEO of Adani Transmission ltd. spoke about the company's performance and outlook for the sector

(Edited excerpts)

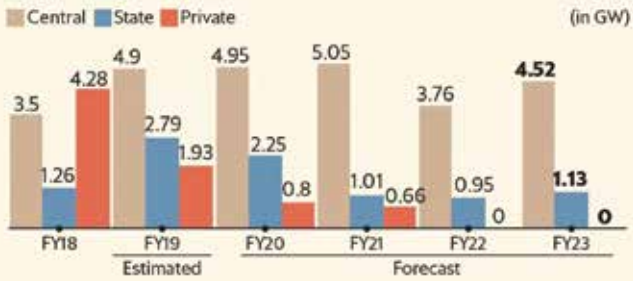
ATL has emerged as the largest private utility in transmission. It has successfully consolidated the assets acquired from GMR Maru and Rinfra's Western Region System Strengthening Scheme assets. Within a short span of seven to eight years, more than 8,511 ckt. km of transmission lines and approximately 14,000 MVA of transformation capacity have been made operational. Besides, an additional 11 projects are under way. The recent acquisition of Rinfra Mumbai's integrated distribution, transmission and generation business will enable ATL to emerge as a significant T&D operator with the aspiration to partake in differentiated distribution reforms. Amidst the on-going consolidation of the transmission business, one of the key priorities will be the integration of the Mumbai suburban distribution business.

Amongst the significant projects in the pipeline are Fatehgarh-Bhadla Transmission Limited, which has approximately 200 ckt. km of line length at the 765 kV voltage level, a 400 kV substation, and the recently won Ghatampur project worth about Rs 20 billion. In addition, eight projects totalling a line length of 2,369 ckt. km and transformation capacity of 2,215 MVA, won through tariff-based competitive bidding, are also under execution.

Thermal power capacity addition to fall by 60% in 5 years: CRISIL

Capacity addition in thermal power generation will slow down over the next five years to less than half the current pace, said ratings agency Crisil in a report.

The report says that India will see about 35GW of thermal power capacity addition from FY19-23 compared with 80GW in preceding five years



Mrs. Manjula Chellur Appointed as new Chairperson of Appellate Tribunal for Electricity

New Delhi: Justice Mrs. Manjula Chellur has been appointed as the new Chairperson of Appellate Tribunal for Electricity (ATE). Prior to this, Mrs. Chellur was Chief Justice of the Bombay High Court.

INDIA ENERGY FORUM

"FUTURE OF POWER IN TAMILNADU"

5th October 2018, Chennai

MCCI The Madras Chamber

India Energy Forum jointly with Madras Chamber of Commerce and Industry organised a Conference "Future of Power in Tamilnadu with the emphasis on "Tamil Nadu should look into developing a roadmap for a 100% electric future" on 5th October 2018 at L&T Auditorium, Chennai. The Knowledge Partner of the Conference was ICRA Management and Consultancy Services.

Mr. Anil Razdan, President India Energy Forum and Former Secretary Power, while addressing the Conference said that, "Tamil Nadu is unique with its excellent mix of different sources of energy." He added that "Power is only one source of energy and we have to recognise the energy demand for mobility and become less reliant on oil. There is a need for an attitude transformation of regulators in improving the financial health of the power sector."

Mr. Ramkumar Ramamoorthy, President, MCCI and ED, Cognizant Technology Solutions in his welcome address lauded the turnaround of the power situation from deficit in 2013 to surplus power today, moving in the right direction. He added that future is electric and a proper roadmap for implementation is necessary.

Mr. Satyajit Suklabaidya, IMACS, made a presentation on how the energy sector has moved significantly from 2013 to 2018. Tamil Nadu has significant wind energy foot print, major portion of which is eligible for repowering. He stated that with a robust automobile ecosystem, Tamil Nadu can steer on to electric vehicle space and benefit from the first mover advantage in attracting investments. The Future of power is greatly dependent on the efficiency and sustainability of TANGEDCO. The signing of UDAY would further improve the financials with an estimated saving of Rs.2282 crore.

Mr. T. Shivaraman, Past President, MCCI and Managing Director, Shriram EPC in his Special Address stated that, "As a country, we do not realise the implication of 100% electric power. 100% electric power will be driven by renewable source due to climate change and cost economics. In future, the interconnected grid failures will make all our systems vulnerable. Hence the grid needs to be smarter and resilient for which, we need to start working today. Innovation and design needs to be in-house and planned for immediately, so as to not lose opportunities to neighbouring countries."

The conference covered five detailed technical sessions on making power generation future ready, are electric vehicles the future, alternate source of energy, managing stressed assets and ensuring efficient financing and looking ahead through R & D for accelerating the power sector. A few eminent speakers in these sessions included Mr. D. Venkatasubbiah-ED Thermal, NLC, Dr. S. Gomathinayagam, Former Director General NIWE & Mr. S. V. Srinivasan, General Manager, BHEL.

Coal Crisis Intensifies with Rising Demand, Poor Evacuation at Ports

India is facing an intense coal crisis this festival season with average coal stock at power plants dropping to six days in October, from nine days in September. While coal is in short supply for more than a year now, it is arguable if the situation was as bad in the recent past.

The crisis is reflecting in the volatility in the spot market for electricity, with round-the-clock average tariff hovering between 7 a kilo Watt hour and nearly 8/kwh over the last couple of days at IEX.

According to daily reports of the Central electricity Authority (CEA), 30 non-pithead power stations have critical stock of less than seven days, and 17 of them have less than four days' stock, as on October 11.

Sources point out that the actual situation is worse, as CEA lists the critical stock position based on despatches from CIL against the Annual Contracted Quantity (ACQ). The ACQ doesn't meet the entire demand, and different plants have different ACQs. However, even the daily report is enough to understand the gravity of the situation.

In Durga Puja-bound West Bengal, many power stations have just one-four days' stock. Only private sector CESC, catering to Kolkata, has a comfortable stock position at both its larger plants — at Budge Budge and Haldia.

Funnily, many NTPC-run pit-head power stations also hold abysmally low coal stock. The 2,100 MW Farakka (Bengal), 1,820 MW Dadri, 440 MW Tanda and 1,550 MW Unchahar (all in UP) plants have one day's stock. The 2,600 MW Korba plant has no stock.

CIL sources said the situation is indeed worrying, with little prospect for improvement in sight due to a relentless rise in demand.

Stepping Up Supplies

"Given the consumption growth, the demand may ease if we can step up supplies from the existing 1.6 mt a day to 2 mt a day. While stepping up production to that level needs time, it is doubtful if we have adequate rail logistics to evacuate that much of fuel," a source said.

The concern is not unfounded. As consumers are turning to imports in greater numbers, coal evacuation logistics from ports is crumbling.

India's Coal Import Rises 35% to 21.1 Million Tonnes in September

India's coal import increased substantially by 35 per cent to 21.1 million tonnes (MT) in September, as against 15.61 million tonnes in the corresponding month previous fiscal. The rise in imports comes at a time when the captive power plants in the country are grappling with the issue of coal shortages.

"The increase in coal and coke imports in September is mainly due to higher imports of non-coking coal during the month under review," according to mjunction services, a joint venture between Tata Steel and SAIL.

There was, however, a marginal drop in coking coal imports on a month-on-month basis, it said.

Overall, coal and coke imports during the first half of the current fiscal increased by 13.9 per cent to 119.42 MT, compared to 104.81 MT in the April-September period of previous fiscal, mjunction added.

Commenting on the coal import trend, mjunction CEO Mr. Vinaya Varma told that, "With the coal shortage persisting in the power sector, there is high demand for imported material. This, accompanied by a correction in thermal coal prices in the global market, has led to higher imports in September. If other things remain the same, this trend is likely to continue in October".

Steam coal imports during the first six months of 2018-19 increased 17.5 per cent to around 82.5 MT, compared to 70.21 MT in the same period previous year, mjunction said.

With the power plants grappling with acute coal shortage, the government has recently directed Coal India and its subsidiaries to give priority to power plants in fuel supply.

Coal India Pushes Back 1bn-t Output target by 6 Years to 2026

Coal India (CIL) has officially pushed back a target to produce 1 billion tonnes annually by 6 years to 2026.

The Goal will be achieved by 2025-26 because of changes in the country's carbon emission targets, sluggish industrial growth, changing energy mix, environmental challenges and difficulties in acquiring land, the state-owned company said in a report. Another factor was the changing trend in the country's coal demand.

The Ministry of coal hired a consultant to prepare a vision 2030 document for the coal sector, taking into account the likely demand under various scenarios, views of the Ministry of power and the impact of the Paris agreement of December 2015 to combat climate change.

Steep Drop In Coal-Power Projects Worldwide

Boom & Bust Report

In a step towards a cleaner environment, the numbers of coal-based power plants under development have seen a steep decline, especially in India and China, a report said.

The report, however, warns that despite a global coal phase-out trend in new coal plants, emissions from operational plants will still keep the 2015 Paris climate agreement goals at bay.

The landmark Paris climate agreement aims at reducing global warming by 1.5 degrees Celsius. In India, the economic pressure and retreat from coal financing by private capital are hailed as reasons that about 16 GW of India's operating coal plants currently lack a power purchase agreement, the report said.

"At 17 sites, the coal plant construction in India is frozen primarily due to a lack of financing," said the report "Boom and Bust 2018: Tracking the Global Coal Plant Pipeline", released recently by Greenpeace, the Sierra Club and Coal Swarm.

For China, the world's second largest emitter, the report credits tightening restrictions on new coal plant projects by Chinese central authorities as the reason for the continued decline in coal expansion.

Currently, India has an installed power capacity of 334.44 GW, of which 214.91 GW is from coal, 62.8 GW from renewable (solar, wind and small hydro), 44 GW from major hydro projects and 25 GW from gas-based power plants. However, the power generation is much less than the installed capacity. In 2017, India's peak power demand was 167 GW.

According to the report, as on January 2018, India has about 87.73 GW of coal-fired power plants under planning and about 43.62 GW under construction. Of this, about 82.35 GW has been stalled.

"It's now widely accepted that the new coal power plants are not financially competitive with new renewables in India. Our analysis shows that significant cost savings can accrue to the country and cash-strapped discoms through a planned phase-out of the most expensive coal power plants already in operation and their replacement with cheaper renewable energy," said Mr. Dahiya of Green Space.

In 2017, only seven countries initiated new coal power construction at more than one location, of which India is one.

“From a climate and health perspective, the trend towards a declining coal power fleet is encouraging, but not happening fast enough,” said Ted Mr. Nace, Director of Coal Swarm.

In 2017, the Ministry of Power reported that 89 per cent of the existing coal plant capacity, or 166 GW, was not following sulphur dioxide emission norms. Over 300 coal plants nationwide have missed their December 7, 2017, deadline to install pollution controls.

NTPC to set up a subsidiary for coal mining soon

“The NTPC will set a coal subsidiary. It would cover operations of its all coal mines and will be run like a coal company. It will have a culture of coal mining. This will help in recruiting professional and have a different cadre which would eventually help in their career progression,” the official said on the condition of anonymity.

The power PSU has been allotted 10 coal mines to meet its fuel requirement of which work has been started in five mines.

“NITI Aayog has already given its approval for setting up a separate subsidiary for coal mining business. Finance Ministry’s approval has been sought for the purpose.”

The official further said that there is a possibility of commercial coal mining at a later stage.

“The company will sell coal to others from these coal mines in open market. But that will happen only after the NTPC meets its owns requirement. Thereafter, the surplus would be sold in open market.”

7th Coal Summit & Expo

5th & 6th September 2018, New Delhi

India Energy Forum organized its biennial flagship event “7th Coal Summit” jointly with The Mining,Geological, Metallurgical Insitute of India (MGMI) Delhi Chapter and Indian School of Mines Alumni Association (ISMAA) - Delhi Chapter on 5th & 6th September 2018 at Hotel The Ashok, New Delhi. Concurrent with the Summit an International Expo was also organized

The Summit was inaugurated by the Chief Guest, **Shri Ashwini Kumar Choubey**, Hon’ble Minister of State for Health and Family Welfare. **Shri Ajay Kumar Bhalla**, Secretary, Ministry of Power was the the Guest of Honour. While the welcome address was given by **Shri Anil Razdan**, President, India Energy Forum & Former Secretary, Ministry of Power, Government of India, the Introduction of Theme was given by **Shri U Kumar**, ISMAA DC and Former CMD, SECL & NCL. **Shri N N Gautam**, Convenor, Organising Committee presented the Vote of Thanks.

The Chief Guest also inaugurated the Expo.

Technical Session I on Policy Perspective : This Session was chaired by **Shri C Balakrishnan**, Former Secretary, Ministry of Coal. The other Distinguished Speakers who shared their views were included **Shri P S Bhattacharyya**, Former CMD, CIL; **Dr Anindya Sinha**, Advisory (Projects), Ministry of Coal; **Shri Devender Prasad**, TS to Director (Tech), Coal India Ltd.; **Shri Sunjoy Joshi**, Director, ORF and **Shri Manoranjan Hota**, Advisor, MoEFCC. The Session was coordinated by **Shri Ashok Mehta**, Former CMD, WCL.

Technical Session II on Coal Resources, Exploration and Exploitation/Production: This Session was chaired by **Shri Alok Perti**, Former Secretary, Ministry of Coal and co-chaired by **Shri S C Khera**, Former CMD, CCL. The other Distinguished Speakers included **Shri Gopal Prasad**, CMPDI; **Shri R N Jha**, Acting CMD, & Director (Tech), MECL; **Shri B Bhaskara Rao**, Director (P&P), SCCL and **Shri Anil Sharda** L&T. The Session was coordinated by **Shri V K Sehgal**, Former CMD, SECL.

Technical Session III on Clean Coal Technologies – Power Sector : The Session was chaired by **Shri S K Chowdhary**, Former Chairman, CIL. The other Distinguished Speakers included **Shri P K Mahapatra**, Director (Technical), NTPC; **Mr. Richard A Horner**, Director, Special Projects & Emerging Technology School of Energy Resources, University of Wyoming ,USA; and **Shri Subir Gupta**, Founder Partner, Sustainability Advisors The Session was coordinated by **Shri S K Grover**, Former GM (Fuels), NTPC.

Technical Session IV on Exploiting Versatility of Coal : The Session was chaired by **Shri K A Sinha,** Former Director (Tech), Coal India CMD, CMPDI and co-chaired by **Shri Prakash Tiwari**, Director, NTPC. The other Distinguished Speakers included **Shri Ajay Kumar Das**, Adani Vizhinjam Port Pvt. Ltd.; **Dr A K Balyan**, CEO (Oil & Gas), ADA Group; **Shri Devender Prasad**, TS to Director, CIL; and **Shri Aiden Neary**, USA; The Session was coordinated by **Shri P S Upadhyaya**, Former Director (T), NMDC.

Technical Session V on Coal as a Green Energy Source : The Session was chaired **Shri P K Sinha**, CMD, NCL. The other Distinguished Speakers who shared their views included **Ms Lydia Powell**, ORF; **Shri Sushil Dubey**, MBE Coal & Mineral Technology India Pvt Ltd; **Shri Sunil Yadav**, Director (Tech), Galacon Infrastructure & Projects Pvt Ltd; and **Dr Dev Kumar Gupta**, Thermax Ltd. The Coordinator of this Session was **Shri A K Tooley**, Former Director, WCL.

Technical Session VI on Environment : The Session was chaired by **Shri P S Bami**, Former CMD, NTPC. The other Distinguished Speakers included **Dr R N Saxena**, Former PCCF, Bhopal; **Shri Rajinder Malhotra**, Head Coal Business, EMIL ; **Dr S K Dube**, Senior Fellow, TERI; **Shri N N Gautam**, Former Advisor, Ministry of Coal; and **Shri Satish Jha**, GM (CP), NCL. The Session was coordinated by **Shri M N Jha**, Former CMD, SECL & CMPDI.

Technical Session VII on Safety : The Session was chaired by **Shri B B Dhar**, Former Director, CIMRI and co-chaired by **Shri Peeyush Kumar**, Director Tech, Ministry of Coal. The other Distinguished Speakers were **Shri O P Singh**, Director Technical (P&P), MCL; **Dr A K Sinha**, Dy DG, Ranchi; **Shri Vivek Mishra**, Sr Vice President and Head Chhatisgarh Coal Mine, Hindalco; and **Shri Om Prakash**, former CMD, SECL and Professor IIT (ISM). The Session was coordinated by **Shri P R Mandal**, Former Advisor, Min of Coal

Technical Session VIII: Infrastructure : The Session was chaired by **Shri Anil Razdan**, Former Secretary, Ministry of Power. The other Distinguished Speakers included **Shri Shashi Bhushan Shukla**, Member (Traffic), Inland Waterways Authority; **Shri Rajneesh Kumar**, Director (Planning), Railway Board; **Shri Uma Shanker**, Adani Mining Infrastructure Development for a Green Coalfield Mine; **Shri S.Simha**, Chief General Manager, Marketing HQ, BEML; and **Shri Vinay Kumar**, GM, NTPC. The Session was coordinated by **Shri V K Jain**, Former Director, NMDC

Valedictory Session

The Valedictory Session was chaired by **Dr M P Narayanan**, Former Chairman, Coal India Ltd. and **Shri Alok Perti**, Former Secretary, Ministry of Coal was the Chief Guest. The other Distinguished Panelists were **Shri U Kumar**, Advisor (Coal), EMIL and **Shri S K Grover**, Former GM (Fuels), NTPC;

The Draft Recommendations emerged during the 2-day Summit were presented by Dr M M Seam.

During the Valedictory Session, 8 AWARDS were also presented to coal and mining companies who are doing best in the following category (two in each categories):

- Production and Productivity;
- Project Implementation;
- Safety Management and
- Best Mine in Environmental Management

The Best Exhibitors Awards were given at the end of the Summit.

Shri Amarjit Singh MBE, Secretary General, India Energy Forum presented the Vote of Thanks.

The Summit was attended in large numbers.

Welcome Dr. Vyas

Dr K.N. Vyas has been appointed as the Chairman of the Atomic Energy Commission and Secretary Department of Atomic Energy

He is the 12th Chairman of the Department created by Homi J Bhabha, the first Chairman, in 1954. Dr. Vyas, an alumnus of the 1979 batch of BARC Training School, has worked extensively on design and analysis of nuclear fuels after starting his career at the Reactor Engineering Division. A fellow of the Indian National Academy of Engineers, he has won several awards, including the Homi Bhabha Science & Technology Award.

India Can Export Nuclear Power Plants

Two-way trade in the nuclear power sector between the US and India would make eminent sense. The latest India-US Joint Statement reiterates that Westinghouse Electric Company would help set up six nuclear plants in India.

But Westinghouse has had billions of dollars of cost overruns in its nuclear reactors in the US, and stands to gain from joining hands with Nuclear Power Corporation of India Ltd. (NPCIL) to better manage its project implementation.

The fact is that NPCIL has been able to streamline project implementation with standardised designs and equipment, and is implementing at least 10 new Pressurised Heavy Water Reactors (PHWRs) nationally.

In sharp contrast, the US, which is building nuclear plants after a long hiatus, seems to have rather rusty expertise when it comes to construction of nuclear power plants.

Last year WEC, owned by private equity firm Brookfield Business Partners, filed for Chapter 11 bankruptcy after design reviews of its new reactor by regulators and huge cost overruns in four nuclear reactors situated in southeast US.

There is much potential for export of India's indigenous PHWRs, and the Joint Statement rightly calls for India's "immediate accession" to the Nuclear Suppliers Group.

PHWRs use natural uranium oxide as fuel, doing away with costly enrichment. The newer NPCIL reactors are designed to be larger 700-MW plants, so as to reap economies of scale, and serial production of nuclear components would keep implementation costs relatively low.

Nuclear reactors can provide baseload power at

attractive costs; Westinghouse and NPCIL do need to partner in the US, and elsewhere in the world afterwards. The Indo-US nuclear deal can surely benefit both nations in hitherto unexplored ways, for mutual gains.

India, Russia Wrap up Strategy to expand Nuclear-ties

India and Russia are expected to concluded 'action plan' for expanding civil nuclear energy partnership during their annual summit. The decision was further rectified during the visit of President Mr. Putin.

The action plan will focus on a second site for Russian nuclear plant in India besides localisation of components for nuclear power plants under the 'Make in India' programme, bolstering cooperation for existing nuclear power plant in Kudankulam and initiatives in third countries.

Putting an action plan in place for expanding civil nuclear partnership was a key item on the agenda during foreign minister Mrs. Sushma Swaraj's recent visit to Moscow. Currently, Russia is the only country that is constructing a nuclear power plant in India.

Russia-supported Kudankulam Nuclear Power Plant (KNPP) is one of the largest nuclear power stations in India. It is scheduled to have six VVER-1,000 reactors with an installed capacity of 1,000 MW each.

During the India-Russia summit last year held in St Petersburg, both the countries signed the general framework agreement for the construction of unit 5 and 6 of KKNPP and an intergovernmental credit protocol necessary for the implementation of the project was also signed.

Currently, intensive ground and infrastructural work is under way for unit 5 and 6. Besides the KNPP, Russia is working with India for the construction of the first nuclear power plant in Bangladesh at Rooppur.

This year in March, the trilateral agreement was signed by India, Russia and Bangladesh. The three sides plan to cooperate in personnel training, experience sharing and consulting support. Under the agreement, Indian companies will participate in construction and installation work, supply of non-critical materials and equipment for the project.

Nuvia Wins DOUNREAY Decommissioning Contract

Nuvia announced that the NaK is to be removed using an existing Water Vapour Nitrogen process - "essentially steam" - that will react with the residue, producing sodium hydroxide, potassium hydroxide and hydrogen. The resultant products will be collected and processed using existing gas filtration systems and the existing Ion Exchange Plant to make them safe for disposal, the company said.

David Craig, Nuvia's Dounreay business manager, said: "This is an important contract win. Over many years Nuvia has a number of decommissioning activities at DFR. We are delighted to continue our relationship. This is an excellent opportunity to pass some of our knowledge and expertise onto the next generation".

The works will be engineered in Nuvia's design offices, from where the first stage procurement and manufacturing of pipework and equipment will also be managed. Installation and commissioning will be

undertaken on the Dounreay site and will be managed utilising Nuvia's local staff with support from the local Caithness and Sutherland supply chain.

The contract started last month and is to be completed within three years. The dome-shaped experimental reactor closed in 1977 and then most of the core fuel was removed, but follow-up work stopped when some of the metallic casings in the zone surrounding the core were found to be swollen and jammed. According to the Nuclear Decommissiong Authority (NDA), which is responsible for the DFR, almost 1000, or two-thirds of the total, were left in place.

The NDA says decommissioning the 50-year-old reactor is one of the most technically challenging projects in its estate and removing the breeder elements has been a top priority. The removal work is expected to take fewer than three years, it said in September last year, and dismantling of the landmark reactor can then begin.

CONDOLENCES

Shri Laxmi Lal Bhandari
15.07.1932 – 20.10.2018

Shri L L Bhandari Former Chairman ONGC and our Senior Member has left for his heavenly abode. We Pray to the Almighty to grant eternal peace to the departed soul.

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

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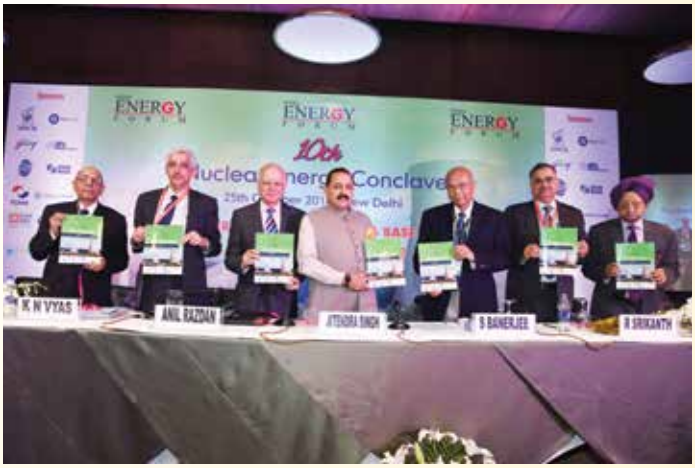
10th Nuclear Energy Conclave

25th October 2018, New Delhi

The Forum's annual flagship event Nuclear Energy Conclave (NEC) was organised on 25th October, 2018 at Hotel Le-Meridien, New Delhi The theme this year was **"Nuclear Power; Towards a Clean and Base Load Energy"**. Important issues for the growth of Nuclear Energy were discussed. After the inaugural session, there was a roundtable on Growth of Nuclear Power and Two Sessions on "Nuclear Energy Applications in Medical and Agriculture" and "Long Term Perspective of Nuclear Power". The Conclave was attended by Indian and foreign companies besides power producers, policy planners, regulators and other stakeholders.

Inaugural Session: Dr Jitendra Singh, MoS (I/C) for DoNER, MoS in Prime Minister's Office, Atomic Energy and Space, inaugurated Conclave for the fourth year in succession While Introductory Remarks were given by **Shri V P Singh**, Convenor, Nuclear, group and Former ED, BHEL, **Shri Anil Razdan**, President, IEF and Former Secretary, Ministry gave the welcome address. Theme address was delivered by Dr. Srikumar Banerjee, Chairman Nuclear Energy Group, India Energy Forum and Chancellor Homi Bhabha National Institute (Former Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy. **Prof Raman Srikanth, Professor and Head, Energy and Environment Programme, National Institute of Advance Studies delivered the Special Address** on "Primary Energy Sources: Nuclear and Solar". The Keynote Address was given by **Dr K N Vyas**, Chairman, AEC and Secretary, Department of Atomic Energy. **Shri Amarjit Singh MBE**, Secretary General, India Energy Forum **gave the vote of thanks.**



Roundtable on "Growth of Nuclear Power" : The roundtable was chaired by Shri S K Sharma, CMD, NPCIL and he shared his views on Fleet Mode Implementation. The other Distinguished Panelists on PHWR and LWR were **Shri Nikita Mazein**, Senior Vice President, Rosatom Overseas; **Shri Anil Parab,** Executive Vice President, Larsen & Toubro Ltd (Equipments); **Shri G K Pillai,** MD & CEO, Walchandnagar Industries Ltd.; **Shri Kaustubh**

Shukla, COO, Godrej & Boyce Mfg. Co. Ltd.; **Shri P P Yadav**, Executive Director - Nuclear Business Group, BHEL and **Dr S Kalirajan**, Head - Special Initiatives (Nuclear-LWR), L&T Construction. The Facilitator was **Shri S M Mahajan,** Former ED, BHEL and Advisor (Power & Mfg)

Session I on "Nuclear Energy Applications in Medical and Agriculture" : This Session was chaired by Shri S A Bhardwaj, Chairman, AERB. The other Distinguished Speakers were Dr Harsh Mahajan, MD, Founder and Chief Radiologist, Mahajan Imaging He is also the Former National President of Indian Radiological and Imaging Association ; Dr Sarbani Ghosh Laskar, Professor and Radiation Oncologist, TATA Memorial Centre and Dr Sudeep Gupta, Professor and Medical Oncologist, TATA Memorial Centre; and Dr V P Venugopalan, Associate Director

(A), BSG, BARC . Shri V P Singh, Former ED, BHEL facilitated the session.

Session II on "Long Term Perspective of Nuclear Power" : This Session was chaired by Dr S Banerjee, Former Chairman, AEC and Former Secretary, DAE. The Distinguished Speakers were Dr A B Mukherjee, Rajaramana Fellow and Former Director RPG, BARC (Indian LWR) and Shri Keith Collett, CEO, Nuvia UK & Deputy Mg Director, Nuvia Group. He replies on Challenges in Supply Chain Management for Advanced Reactors – the UK Experience. As, Dr S Banerjee gave an address on FBI and Thorium. Long term impact on India's, Nuclear Progress.

Shri S M Mahajan, Former ED, BHEL and Advisor (Power & Mfg) summed up the discussion.

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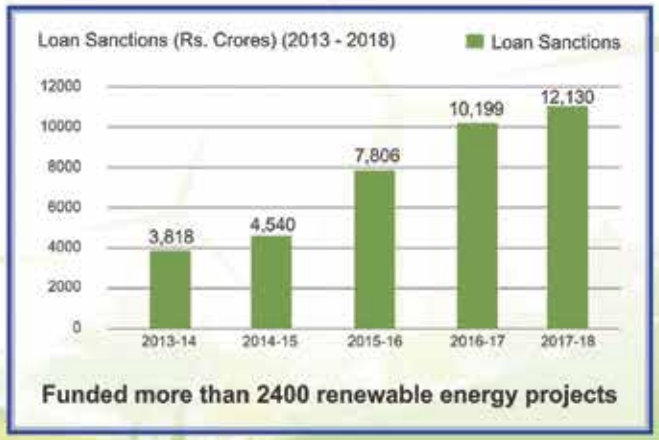

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