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SPECIAL ISSUE

elets NATIONAL POWER SUMMIT
HYDERABAD, TELANGANA
9th FEBRUARY 2018

FLASHBACK

elets NATIONAL WASTE MANAGEMENT SUMMIT
HYDERABAD
Conference Report

K CHANDRASHEKAR RAO
Chief Minister, Telangana

G Jagadish Reddy
Minister for Energy and Scheduled Caste Development, Government of Telangana

TELANGANA
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11th eINDIA
P P Chaudhary
Union Minister of State for Law and Justice; and Electronics and Information Technology, Government of India

Urban Development Summit
K T Rama Rao
Minister for IT, Municipal Administration & Urban Development, Government of Telangana

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> MAGAZINE

It compiles ICT-related advancements being introduced, exercised by various government organisations via eGovernance module.

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Dealing with various key developments and policy-related decisions that define Indian governance style at large, this section throws light on the most important aspects.

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It deals with in-depth detail of various projects being implemented in any part of the country, worth inspiring others in providing solutions.

> VIDEOS

The youtube channel '*EletsTv*' deals with live recorded versions of tech-experts and key decision makers who participate in key debates or discussion of Elets knowledge conferences.

> INTERVIEWS

This section highlights various stakeholders, bureaucrats and policy makers influencing governance in the country.

Telangana – The Rising Power House of India

Telangana is showing a remarkable development in various sectors, the Power being one of them.

Within six months of being recognised as the 29th Indian state in 2014, it left many people awestruck by turning a zero power-cut State. In next three years, it was a power-surplus State! Not many may believe it was reeling under severe power crisis before being separated from Andhra Pradesh.

eGov magazine has tried to delve into the power sector of the country through the National Power Summit, Hyderabad being organised by our Elets Technomedia in association with Energy Department, Government of Telangana and Telangana State Renewable Energy Development Corporation Ltd (TSREDCO) .

Telangana makes an obvious special case for study. Our cover story 'Transformed Power Sector in Telangana Set High Benchmarks for the Country' is an attempt in this direction.

In this special issue, we have carried the messages of Telangana's Chief Minister K Chandrashekhar Rao; Minister for Energy and Scheduled Caste Development Guntakandla Jagdish Reddy, Minister for Irrigation, Marketing and Legislative Affairs T Harish Rao. They have lauded efforts of our Elets Technomedia for organising this Power Summit in association with Energy Department, Government of Telangana, and Telangana State Renewable Energy Development Corporation Ltd (TSREDCO).

In a special interview, Telangana Energy Minister Guntakandla Jagdish Reddy has also shared his vision for providing free electricity to State's farmers 24X7. Similarly, A Sudhakar Rao, Vice Chairman & Managing Director of Telangana State, Renewable Energy Development Corporation Ltd (TSREDCO) has also shared his perspective on the current power scenario in the State.

Since this issue focuses on power sector, a special feature on power as one of the most critical components of infrastructure crucial for the economic growth and welfare of nation has appeared in it.

A special feature on the Indian Renewable Energy (IRE) sector, which is the second most attractive renewable energy market in the world and ranks fourth in the world in terms of total installed wind power capacity, is also there.

From the Industry, Vivek Naidu-Vice-President, Information Management (India Cluster), Kodak Alaris India Pvt Ltd and Nikhil Bagalkotkar, President, Head-Virtualisation, Citrix India have shared their perspectives.

This issue also carries a report of Waste Management Summit held recently in Hyderabad. It was inaugurated by K T Rama Rao, IT, Industries, Municipal Administration, Mines & Geology, & NRI Affairs Minister, Government of Telangana. The report is about recommendations of key policymakers and industry leaders.

Touching upon various facets of development through a number of special features, interviews, and articles including of policymakers to industry leaders, we hope this special issue will evoke interest and invite an invaluable feedback of readers.

DR RAVI GUPTA

Editor-in-Chief, egov magazine, and CEO, Elets Technomedia Pvt Ltd

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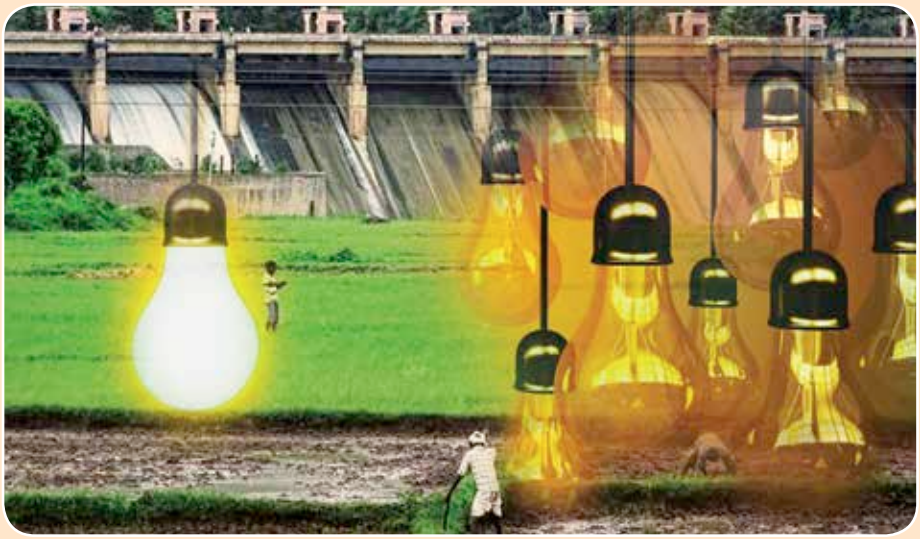

Further Reading

CONFERENCE REPORT

एन. युवराज, भा. प्र. से.
N. YUVARAJ, IAS

भारत के उप-राष्ट्रपति के निजी सचिव
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TO THE VICE-PRESIDENT OF INDIA
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MESSAGE

The Hon'ble Vice President of India is happy to learn that Department of Energy, Government of Telangana in association with Elets Technomedia Pvt. Limited is organizing National Power Summit, Telangana on February 9, 2018 in Hyderabad.

The Vice President extends his greetings and congratulation to the organizers and the participants and wishes the event all success.

31/1/2018

(N. YUVARAJ)

New Delhi
31st January, 2018.

K. CHANDRASEKHAR RAO

Chief Minister
Telangana

Hyderabad

Dt. 03-02-2018.

MESSAGE

I am happy to note that the Department of Energy, Telangana Government and the Elets Technomedia jointly organizing a National Power Summit on 9th February 2018.

I am also happy to note that a special issue of Telangana eGov magazine is being brought out on this occasion.

I wish the event a grand success.

K. CHANDRASEKHAR RAO

G. JAGADISH REDDY
Minister for Energy and Scheduled Caste Development

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Hyderabad.

Date :

MESSAGE

I am really very happy to know that the ***Elets Techno Media Private Ltd.,*** *in association with Energy Department, Government of Telanagana and Telangana State Renewable Energy Development Corporation Ltd., is organising National Power Summit, on 9th February, 2018 to facilitate a knowledge sharing and collaboration platform. The deliberation in the summit will go a long way in moulding policy framework and vision for future renewable and green energy. I congratulate the the Elets Techno Media Private Ltd., and others who are organising this summit. I also wish the summit a grand success.*

G. Reddy
(G. JAGADISH REDDY)

T. HARISH RAO
MINISTER FOR IRRIGATION, MARKETING AND LEGISLATIVE AFFAIRS

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MESSAGE

It gives me great pleasure to know that the Energy Department, Government of Telangana and Telangana State Renewable Energy Development Corporation, in association with Elets Technomedia, are organising National Power Summit on 9 February 2018.

Telangana is the first State in the country to be supplying free 24-hour electricity to the agriculture sector. The Energy department has been putting its continuous effort to provide 24*7 affordable and environmental power to all it citizens.

I hope the deliberation at this conference will provide an opportunity to all the participants to interact with each other and discuss on the issues related to promote energy generation and conservation in the State.

I convey my congratulations to the Department and the e-gov Magazine for launching the Souvenir. I am sure that the Souvenir will highlight the endeavors of the Government of Telangana to boost and transform the Power sector with its policies.

(T.HARISH RAO)

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Transformed POWER SECTOR in TELANGANA Sets High BENCHMARKS for The Country

The Government of Telangana is providing 24x7 power supply for agriculture purpose, setting an example for other proactive States in the country to follow suit, writes **Sudheer Goutham** of **Elets News Network (ENN)**.

K CHANDRASHEKAR RAO
Chief Minister Telangana

Telangana, the youngest and 29th State of India, created history especially in the power sector. As a direct fall out of its separation from united Andhra Pradesh in June 2014, the State was reeling under severe power-crisis.

However, the State has shown a paradigm transformation by turning itself into a zero-power cut State within six-months and then into a power-sufficient State in next three years.

On December 31 midnight, Telangana in a historic move in the power sector by announcing 24x7 power supply for agriculture in the State.

That means the State will supply uninterrupted power supply to 23 lakh agriculture pump sets, ensure 11,000 MW power demand by March 2018 and will invest an amount of Rs 12,610 crore in setting up new power lines, transformers and sub-stations.

Transmission Corporation of Telangana Ltd's Chairman and Managing Director D Prabhakar Rao and Southern Discom Managing Director Raghuma Reddy formally launched the scheme at Pothaipalli Village in the State's Medchal Malkajgiri district at 12.01 am.

Achievement during Jan-Nov 2017

- Electrification of unelectrified villages: 3,652
- Intensive electrification of villages: 60,218
- Free electricity connections to BPL households: 24.55 lakh
- SAuBHaGYa: Pradhan Mantri Sahaj Bijli Har Ghar Yojana

Telangana Chief Minister K Chandrasekhar Rao described the 24X7 agriculture power supply as a New Year gift for farmers.

"Though certain states are supplying power to farmers free of cost, it is only for a few hours and some States are giving 24-hour power supply but for a price. Telangana is the only state which is supplying power to farmers round the clock free of cost," the Chief Minister said.

Ajay Misra, Special Chief Secretary, Energy Department, Telangana said, "We are prepared to provide the present peak power demand of 9,500 MW to agriculture sector. Also, would meet the expected increased (20% - 30 %) power demand of 11,000 MW by March. In order to achieve this in-a-first initiative in the country, our Chief Minister K. Chandrashekar Rao was on ground with the team since last one year too."

Chief Minister also announced a special increment for electricity employees in recognition of their efforts.

According to Prabhakar Rao, Chairman and Managing Director, TSTRANSCO and TSGENCO, the demand from the agriculture sector in January will be around 9,500 MW, which might go up to 11,000 MW by March.

"Our transmission and distribution system can bear the load up to 17,000 MW. We have strengthened the transmission and distribution systems at a cost of Rs 12,610 crore in the last three years," Rao said.

In addition to the present 14,845 MWs of captive power generation, Telangana is setting up new plants to add an additional 13,000 MWs in future. By 2022, 28,000 MWs of power will be available in the State , said the officials.

Electricity Supply

Telangana is on a mission. The electricity supply is crucial to farmers who use motorised pumps to irrigate their fields. It largely depends on groundwater due to lack of canal irrigation. Distribution companies, at present, are able to meet a maximum power demand of 9,500 MW to agriculture sector during peak hours of the day.

Transco officials have said at least 1,500-2,000 MW of additional power is required to meet increasing demand and implement the free-power programme.

Though it is one of the best initiatives, the State's vision and mission is to be the best performing utility in the country. It aims to be one of the best utilities in the world with the use of state-of-the-art technology and smart solutions and to generate adequate, reliable, cost effective and eco-friendly power by spearheading accelerated power development. It is possible through the proper planning and implementation of new power projects.

Telangana State Power Generation Corporation Ltd (TSPGCL) was incorporated under Companies Act, 2013, on May 19, 2014 and commenced its operations from June 2, 2014. The corporate has risen to this level in just three years. Ever since, the Government of Telangana came to power, the State has the distinction of being zero power-cut State in the country. Telangana has achieved this in the power sector in addition to what the Government of India has embarked upon a massive programme to provide 24x7 power across the country by 2019.

India: 24x7 Power by 2019

The Government of India has embarked upon a massive programme to provide 24x7 power across the country by 2019. Till completion of half of its term, the Government had achieved many important milestones in the Power sector. Special focus has been given to rural electrification, under Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY); and Urban Electrification under Integrated Power Development Scheme (IPDS). The schemes have been now oriented towards individual household electrification by March 2019, under Saubhagya scheme.

Several landmark decisions have already been taken in thermal power generation, hydel and more importantly in solar, wind and other green energy, besides strengthening of transmission and distribution, separation of feeder and metering of power to consumers. These also include not only achievements in capacity addition but also important reforms being undertaken on increasing energy efficiency of the present infrastructure and thereby reducing power losses, including increasing accountability and transparency by launching mobile applications and websites like Urja app, Saubhagya portal, National Power Portal, MERIT portal etc. Under DDUGJY, Projects with total cost of Rs. 42,565 crores have been sanctioned in 32 States/Union Territories.

AJAY MISRA
Special Chief Secretary, Department of Energy, Government of Telangana

"We are prepared to provide the present peak power demand of 9,500 MW to agriculture sector. Also, would meet the expected increased (20% - 30 %) power demand of 11,000 MW by March."

Status of Village electrification in the country

Cumulatively (as on November 30, 2017), electrification in 1,24,219 villages and intensive electrification in 4,68,827 villages has been completed. Free electricity connections to 277.20 lakh Below Poverty Line (BPL) households have been released. 18,452 census villages in the country (out of total inhabited villages of 5,97,644 as per Census 2011) were reported unelectrified by the States as on April 1, 2015.

As on November 30, 2017, electrification in 15,183 villages has been completed and 1,052 villages have been reported uninhabited. Remaining 2,217 villages are expected to be electrified by 1st May 2018. These 2,217 villages are located in the State of Arunachal Pradesh (1069), Assam (214), Bihar (111), Chhattisgarh (176), J&K (99), Jharkhand (176), Karnataka (8), Madhya Pradesh (34), Manipur (54), Meghalaya (50), Mizoram (11), Odisha (182) and Uttarakhand (33).

Integrated Power Development Scheme: IPDS Scheme aims to provide quality and reliable 24x7 power supply in the urban area. So far, projects worth Rs 26,910 crore covering 3,616 towns have been sanctioned by the Monitoring Committee. State utilities have awarded the works worth Rs 23,448 crore. The IT and technical intervention envisaged in the scheme will not only ensure 24x7 power supply in urban area but will also help in improvement in billing and collection efficiency which will ultimately result in reduction in Aggregate Technical and Commercial (AT&C) losses. So far, under R-APDRP 1,363 towns have been declared "Go-Live", 52 towns SCADA control systems have been established, 20 SCADA towns have been completed and 20 out of 21 Data Centres have been commissioned under Part-A of the programme. Part-B projects have been completed in 970 towns. All India Short Code '1912' for consumer connect adopted in 45/57 Discoms (including private) in India.

Ujwal Discom Assurance Yojana: Ujwal DISCOM Assurance Yojana (UDAY), a scheme for financial and operational turnaround of power distribution companies was formulated and launched by the Government on 20th November, 2015 in consultation with various stakeholders.

The scheme aims to provide permanent solution to the legacy of debts of approximately Rs 4.3 lakh crores and address potential future losses. The scheme also envisages reform measures in all sectors – generation, transmission, distribution, coal, and energy efficiency. The scheme availability period expired on March 31, 2017. Nagaland, Andaman & Nicobar Islands, Dadra & Nagar Haveli & Daman & Diu signed Memorandum of Understanding with Government of India under UDAY Scheme on 20th Nov, 2017. With this, 27 States and 4 UTs have joined UDAY till date.

"Our transmission and distribution system can bear the load up to 17,000 MW. We have strengthened the transmission and distribution systems at a cost of Rs 12,610 crore in the last three years,"

PRABHAKAR RAO
Chairman and Managing Director, TSTRANSCO and TSGENCO

TELANGANA – Triggering Power Revolution in India

Telangana is in a position to tackle current demand of 15,000 MW. The free power to agriculture sector is available to 23 lakh agriculture pump sets, says Guntakandla Jagadish Reddy, Minister for Energy, Government of Telangana, in conversation with Sudheer Goutham of Elets News Network (ENN).

What is Telangana Government's Draft Policy on Wind Energy?

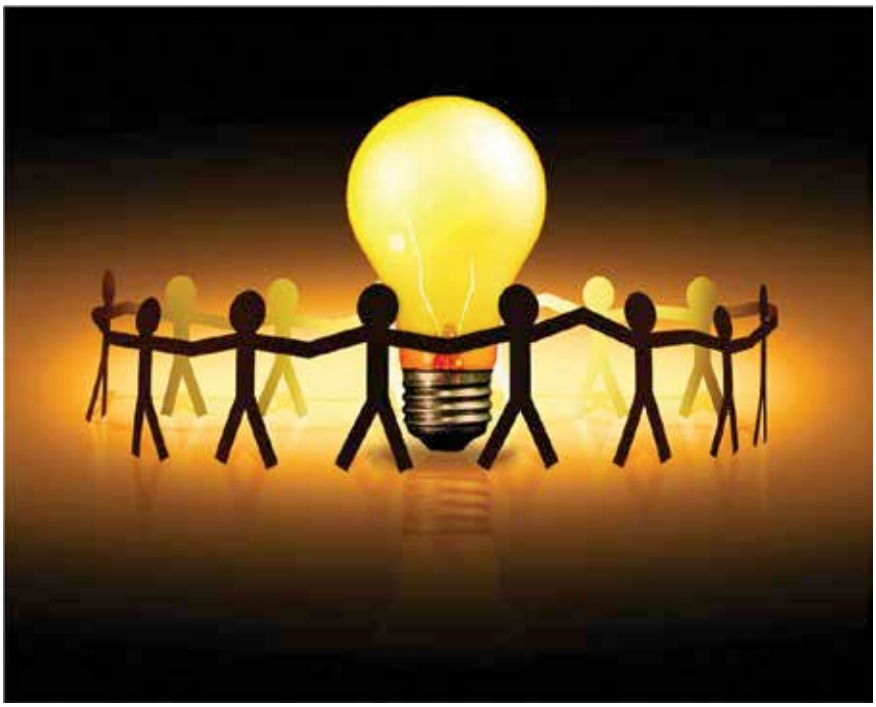
Similar on the lines of Telangana State Solar Power Policy, the Government of Telangana State has put in place Draft Wind Power Policy. The draft wind power policy is progressive with and ease of doing business provisions and incentives for tapping the wind power potential in the State. The policy also lays emphasis on competitive bidding in wind power procurement. This is in-line with the recently notified competitive bidding guidelines of MNRE.

Is Telangana state ready with the infrastructure to facililitate 24X7 power supply?

In accordance with the vision of Telangana to provide uninterrupted power to all consumers over the coming years, the State in coordination with Telangana State (TS) utilities have embarked on a massive capacity expansion plan for the next three years, which includes 6,840 MWs by TS Genco, 4,000 MWs by National Thermal Power Corporation (NTPC) and 2,000 MWs by Singareni Collieries Company limited (SCCL). Out of the above capacity additions planned, a total of 930 MW has been commissioned by TS Genco and 1,200 MW from SCCL.

By virtue of advance planning and meticulous execution of activities, TS utilities were able to meet the highest peak demand of 9,500 MW recorded on 13th September, 2017. To maintain uninterrupted power supply to the twin cities, 400 KV ring main system has been established around Greater Hyderabad Municipal Corporation (GHMC) area by erecting 142 ckm of 400 KV lines interlinking the substations and building six of 220 KV substations around the city

A robust network is critical for delivering reliable power as well in providing access to energy to larger section of the society. Post formation of the State, in order to improve the reliability of power supply, the TS Transco and Discoms have taken several measures to develop the infrastructure in the State. An estimated amount of Rs 12,136 crore has been invested towards the development of infrastructure since the formation of the State till November 17 lastyear.



"Post formation of the state, in order to improve the reliability of power supply, the Telangana Discoms have taken several measures to develop the infrastructure."

I am happy to note that because of the above stated measures undertaken by the Government of Telangana State and the concerned organisations, we have been successful in supplying 24 x 7 supply to all agricultural consumers from the beginning of this year.

What is the demand-supply scenario of power in Telangana?

The State of Telangana is witnessing robust growth in energy demand which can be attributed to industrial growth as well governmental initiatives such as 24 x 7 supply to agricultural consumers and lift irrigation schemes. Due to the progressive policies and initatives taken by the State, it is expected that the projected energy demand of 64,291 MU in FY 2018-19 would be comfortably met through the existing contracts which are in place.

What steps have been taken in renewable energy sector to meet the peak demand for FY 2018-2019?

The Government of Telangana State has been a front runner when it comes to additions of renewable energy capacities. The installed capacity of solar power in the State is in excess of 3,200 MW. The distributed generation model of solar capacity additions in the State has been an innovative one which aims at bringing solar generation closer to demand centres resulting in minimising transmission losses as well as upstream network investments.

The assessed per capita consumption in the State of Telangana is about 1,505 units for the FY 2016-17. By virtue of advance planning and meticulous execution of activities, TS utilities were able to meet the highest peak demand of 9,500 MW recorded on 13th September, 2017. In energy terms, TS Utilities were able to supply 198 MU on the same day. I am happy to state that the TS utilities are fully geared up to meet the maximum demand of 11,000 MW during the coming Rabi season.

Can you please brief us on action plan for TSGENCO?

TSGenco has played a key role in expediting works in order to achieve commissioning in a timely manner. In short time 600 MW of KTPP Stage II was commissioned in April 16. Hydel capacities of 360 MW - lower Jurala and Pulichintala was commissioned last year. Further, TS Genco has set the following timelines for commissioning –

KTPS Stage VII – 800 MW – By June 18

BTPS (Manuguru) – 1,080 MW By May 19 in a phased mannerDamercherla– 4,000 MW By April 2021 in a phased manner

"The State of Telangana receives 1,000 MW of power from Marwa plant in Chattisgarh. Inter-state transmission line plays a key role in transfer of power between the States."

Can you please brief us on the Government of India's interventions in Telangana Power Sector?

The Government of Telangana, TS Discoms are joint signatories along with the Government of India's in the Memorandum of Understanding (MoU) on UDAY scheme. This is a tripartiate agreement which clearly outlines the responsibilities of each of the signatory.

In line with the UDAY MoU, the Government of India is expected to provide the additional funding support under IPDS, DDUGJY schemes and also in allocation of additional domestic coal and to TS Genco stations. Support is also expected on faster completion of inter-state transmission lines.

What is Telangana's current Transmission network?

TS Transco is amongst the best performing transmission utilities across the country. The cumulative transmission losses for FY 2017-18 till Dec is 3.31 per cent and transmission system availability is 99.9 per cent. Since inception, to meet the agriculture

and other demand in the state, 8896.5 MVA of transmission capacity has been augmented at the EHT level. The transmission capacity stands at 22,956 MVA.

What is the present status of Interstate Transmission System in Telangana?

The State of Telangana receives 1,000 MW of power from Marwa plant in Chattisgarh. Inter-state transmission line plays a key role in transfer of power between the States. With the charging of 765 KV double circuit line from Wardha to Maheshwaram the new state of Telangana is able to draw power from NEW grid

Please brief us on Telangana power distribution plan?

Post formation of the state, in order to improve the reliability of power supply, the Telangana Discoms have taken several measures to develop the infrastructure. TSSPDCL has spent an amount of Rs. 4,471 crores and TSNPDCL has spent an amount of Rs. 1,876 crores for the development of infrastructure post formation of the state. All SS and lines are maintained as per schedule. 4 per cent of rolling stock of DTRs are available in all the 188 SPM sheds. Unlike in the past, where delays were encountered in replacement of burnt DTRs, transformers are currently replaced within 6 hours in urban areas and 24 hours in rural areas. DTR failure rate is below 10 per cent.

What are the Smart Grid initiatives of TSSDPCL?

TSSPDCL, in its endeavour to be the best utility in the country, has been taking a number of initiatives to ensure optimum utilisation of its resources and to seize power loss and theft in the state of Telangana and in offering high levels of reliability. Some of the key initiatives are detailed below:

- **Automatic Meter Reading Modems (AMR):** AMRs enabled with GPRS are affixed to Feeder Meters at substations, to capture data from the meters of HT and LT high value consumers. This is expected to lead to better governance.
- **Online Prepaid Smart Meters:** Online Smart Prepaid Metering architecture is being implemented under TSSPDCL to overcome the problems with existing process, gain valuable information on consumption patterns which can be used for better grid management and providing differentiated services to consumers.
- **SCADA/DMS Project:** After formation of the Telangana state, TSSPDCL launched SCADA/DMS project in Hyderabad Agglomeration area with cost of Rs.158 crore which enabled upgradation of the existed distribution system with Real time supervision and control of 33/11kv substations and 11Kv network. The project envisages automatic control of 228 Nos. of 33/11Kv Sub-Stations and 156 Nos. 11Kv feeders in core city of Hyderabad and in turn the entire power flow in the substations and feeders are remotely viewed and controlled.
- Smart grid pilot project in implementation in one of the industrial areas.

Ajay Mishra
Special Chief Secretary
Department of Energy
Government of Telangana

Telangana's 24X7 POWER SUPPLY a Boon to Farmers

One of the major objectives of the State is to supply reliable and quality power to all categories of consumers in an affordable manner, says **Ajay Mishra**, Special Chief Secretary, Department of Energy, Government of Telangana in conversation with **Sudheer Goutham** of **Elets News Network (ENN)**.

"This improved power supply has led to many other benefits such as improvement in productivity for industrial consumers, and quality of life for all consumers in the state."

How Telangana has transformed itself from a power deficit State to now the first state in the country to supply 24x7 free power to agriculture?

Since the formation of Telangana in the year 2014, it has been the vision of the Hon'ble Chief Minister Shri K Chandrashekar Rao to develop Hyderabad as a global city and Telangana as the best State in the country. Providing 24x7 free power supply to farmers and ensuring reliable and uninterrupted power supply to all the sectors in the State is a core component of the vision of the Chief Minister.

The total contracted capacity of Telangana at the inception was 6,573 MW only. We inherited a power deficit scenario at the time of the formation of state, load shedding for the domestic sector, power holidays for the industry sector and unreliable 6 to 7 hours of power supply to farmers were in vogue. Power generation in the State was short by 30 per cent as compared to the total demand at that point of time. However, after the formation of the state, the Government of Telangana has taken several measures to ensure 24X7 power availability to industry and domestic. We are the first state in the country to implement 24x7 free power supply to farmers. This was achieved by contracting sufficient quantities of power to overcome the power deficit scenario. Highest emphasis was placed on timely commissioning of generation plants which were under progress and also in execution of works for construction of new generation plants. We have undertaken a massive capacity expansion plan for the next three years and that includes 5,880 MWs by Genco, 4,000 MWs by NTPC and 800 MWs by SCCL.

What is the current position of Telangana in terms of Renewable Energy generation?

One of the major objectives of the State is to supply reliable and quality power to all categories of consumers in an affordable manner. The Government of Telangana realised the need for development of renewable power projects and strengthened the State Nodal Agency for the promotion of renewable generation – TS REDCO.

The State Government has announced progressive solar power policy which was well received by the industry. The policy has ease of doing business provisions and incentives for promotion of solar power in the state. Promotion of solar energy supports our vision of meeting the needs of farmers. The Energy department in co-ordination with TS Discoms have been pioneer in introducing distributed solar energy in the State. This model ensured generation of solar energy closer to the demand centres resulting in minimising of transmission losses and upstream network investments.

Tenders were invited for solar power capacity of 500 MW in 2014 and 2,000 MW in 2015. Including the earlier procurement of solar power prior to 2014, the current installed capacity of solar power in the State is 3,204 MW. A solar capacity of 603 MW is under commissioning. Sustained efforts of the Energy department and TS Discoms have enabled Telangana to establish itself as a leader in solar energy generation across India.

Tell us about the implementation of 24x7 free power supply to farmers?

The duration of power supply to agriculture was increased from 6 hours to 9 hours in 2016-17, keeping in view the energy requirement of farmers during August, 2017, the Government has implemented 24x7 free power supply to agriculture sector in three districts, on a pilot basis. In November 2017, on a pilot basis, the government has implemented 24x7 free power supply to agriculture sector for the total state for 10 days. Now, from January 1, 2018 onwards, the 24x7 free power supply was successfully implemented in all the districts by commissioning of new power plants, expanding state transmission and distribution network, and commissioning of 765 KV inter-state transmission line by Power Grid Corporation.

> *"Going beyond the village electrification, 98 per cent households have been electrified so far and remaining are planned to be electrified by the end of 2018."*

The State Government has conceptualised major Lift Irrigation schemes in the State. This requires substantial power requirement. Energy department in coordination with TS Genco has planned capacity additions to meet the energy requirements of agriculture, irrigation and growth from other categories.

The above achievements was made possible on account of the vision, planning, support, and determination of the Chief Minister to ensure an uninterrupted 24x7 power supply to all the sectors and all round development of the State. Under the guidance and support of the CM, the following could be achieved by TSGENCO & TSTRANSCO.

Achievements of TSGENCO:

In a short span of time, KTPP Stage-II-600 MW was commissioned on 10th December, 2015. Hydel projects of 360 MW at Jurala and Pulichintala were also commissioned during 2015. Further, TSGENCO has taken up commissioning of the following projects:

- KTPS Stage VII – 800 MW by June, 2018
- BTPS (Manugur) – 1080 MW by May 19 in a phased manner
- Damercherla- 4000 MW by April, 2021 in a phased manner.

Achievements of TSTRANSCO& TS Discoms

TSTRANSCO is amongst the best performing transmission utilities across the country. The transmission losses of the state have come down from 4.3 per cent in April 2014-15 to 3.31 per cent in 2017-18 (till Dec 17).

The overall T & D losses in the state of TS has come down from 16.24 per cent in FY 2014-15 to 14.29 per cent in FY 2016-17.

Where does Telangana stand in India's overall Power Vision?

Telangana is one of the leading States in the Country in terms of providing 24x7 uninterrupted power supply to all sectors. It is pertinent to note that 24x7 power supply is one of the flagship programme of the Government of India. As on date, very few States have achieved the benchmark of 100 per cent electrification of villages and it is a matter of pride that Telangana is one of such States. Going beyond the village electrification, 98 per cent households have been electrified so far and remaining are planned to be electrified by the end of 2018, which is again a flagship programme of Govt. of India.

Telangana discoms has always been in the forefront in upgrading its infrastructure and usage of technology to provide reliable power supply to its consumers. There is no power shedding in Telangana right from the inception of the State. This improved power supply has led to many other benefits such as improvement in productivity for industrial consumers, and quality of life for all consumers in the state.

Telangana Making Mark In New Energy Sector

The renewable energy practices adopted by Telangana made it stand first in the country with regard to commissioned capacity, says **A Sudhakar Rao**, Vice-Chairman and Managing Director, Telangana State Renewable Energy Development Corporation Ltd (TSREDCO), in conversation with **Divakar Mukherjee** of **Elets News Network (ENN)**.

A SUDHAKAR RAO
Vice-Chairman and Managing Director, Telangana State Renewable Energy Development Corporation Ltd (TSREDCO)

Please give us an overview of TSREDCO.

In pursuance of the Section 53 of the Andhra Pradesh Reorganisation Act 2014, a separate Telangana State Renewable Energy Development Corporation Ltd (TSREDCO) (formerly TNRDECL) has been created which acts as a nodal agency for implementing all new and renewable energy programmes and energy conservation activities in the State.

Accordingly TSREDCO is promoting the utilisation of renewable energy as a State Nodal Agency to the Ministry of New & Renewable Energy (MNRE) and State designated agency to the Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India, under the administrative control of Telangana Government.

What are the major objectives of TSREDCO?

The planning and preparation of policies for promoting renewable energy and energy conservation activities is one of the major objectives of TSREDCO. It also monitors and verifies initiated renewable energy technologies. TSREDCO is also responsible for import, upgradation and adapting of upcoming technologies in the areas of renewable energy and energy conservation. It also promotes Research and Development in the field of renewable energy and energy conservation.

What major activities are taking place in Telangana in the field of renewable energy?

Activities in the State consist of biomass, bagasse, solar, wind, mini-hydel, waste based power projects (Grid and Off-Grid). It also consists of promotion of energy conservation in Small Medium Enterprises, large industries, commercial establishments (ECBC) and transport sector, demand side

management activities, promotion of energy efficient equipments and conducting awareness workshops and training programmes for promoting energy conservation.

What are the non-conventional/ renewable energy initiatives taken by the corporation?

We are promoting the use of renewable energy by providing the subsidies, incentives and technical support to the beneficiaries. Programmes such as solar rooftop, solar off grid, biogas and biomass, municipal and industrial solid waste, wind energy etc will also be covered.

How is the corporation fostering energy conservation in rural and urban areas?

Telangana is a leading State in implementation of ECBC through strong compliance framework. As part of energy conservation initiative, TSREDCO is implementing various programmes such as:

9 Watt LED bulb distribution programme at subsidised price in the entire State. Energy Efficient LED streetlight programme to improve the livelihood, safety and to reduce the energy consumption in the villages of Telangana.

More than 30 energy intensive industries, covering three cycles, are covered under PAT scheme in Telangana. PAT cycle I is completed, Cycle II and III are in progress. TSREDCO is working in coordination with BEE to implement the scheme in the State.

TSREDCO is successfully conducting energy conservation day and week celebrations during December 14 to 21 in the entire State. The programmes such as technical and awareness workshops, energy walks, energy conservation awareness programmes for school children and college students and many more are taking place. We took part in National energy conservation painting competition where Telangana bagged two national painting awards.

We have also started Telangana State Energy Conservation Awards to encourage the professionals, industries, buildings, ULBs and institutions etc and to promote the energy conservation further in the State.

How is the State Government promoting new and renewable energy? What policies and new initiatives have been undertaken in this regard? How is the Corporation implementing those?

We are promoting the usage of renewable energy by providing the subsidies, incentives to beneficiaries such as notifying solar rooftop net metering policy, wind energy programmes, solar off-grid programmes, biomass and Biogas programmes, municipal and industrial waste programmes etc.

How are you ensuring renewable energy practices of Telangana at par with global standards?

The renewable energy practices especially in solar adopted by us made Telangana to stand first in the country with regards to commissioned capacity. We have already 20 per cent of the State installed through renewable energy generation as mandated by the Government of India.

Training is a crucial part of creating awareness amongst the masses. What all the training programmes the corporation is operating?

TSREDCO successfully conducts renewable energy awareness and training programmes such as Suryamitra programme for enhancing the skills in the unemployed youth for their livelihood and other awareness programmes in the State.

TSREDCO receiving national and State awards for contribution towards renewable energy development

As part of strengthening energy conservation initiatives, TSREDCO is conducting training programmes on ECBC, other technical and awareness programmes on energy conservation.

What initiatives TSREDCO has undertaken to adapt the developing technology across the world? What new technologies have been imported?

Presently, TSREDCO is developing draft policy on renewable energy power generation through hybrid mode and storage devices. TSREDCO is also working towards implementation of electric vehicle policy.

TSSPDCL Committed to Supply 24x7 Electricity in Telangana

Telangana has moved from an energy deficit to energy surplus State in a short time span, says **G Raghuma Reddy**, Chairman & Managing Director, TSSPDCL in a conversation with **Divakar Mukherjee** of **Elets News Network (ENN)**.

Give us an overview of TSSPDCL.

Southern Power Distribution Company of Telangana Limited (TSSPDCL) was incorporated along with the birth of the State of Telangana on 2 June, 2014. It is responsible for supplying reliable and affordable power in the southern region of the State.

TSSPDCL has developed a reliable power delivery infrastructure and currently maintains a vast infrastructure network, which includes 1,461 of 33/11 KV substations; 2,812 power transformers; 1,061 of 33 KV feeders; 6,345 of 11 KV feeders; and around 370,113 distribution transformers of various capacities.

TSSPDCL generated an income of Rs 17,743.77 crore from its operations during 2016-17. The peak demand met for the year FY 2017-18 was 6313 MW. On an average, TSSPDCL delivers 121 MU per day to various categories of consumers. The corporation has a strength of over 9,000 employees.

How is TSSPDCL promoting New & Renewable Energy in the State? What policies are in place?

Telangana State has been a frontrunner when it comes to realising the ambition of the Central Government of making India a country powered by green sources. Since its inception in 2014, TSSPDCL has been able to bring the installed capacity of Solar to almost 3.1 GW through state-specific bidding, NTPC bundled schemes, rooftop net metering, third-party and captive projects. This was made possible by required push from the Government and DISCOM. The developers were attracted to the bidding process by offering appropriate incentives.

The solar policy provides fiscal incentives with ease-of-doing business provisions to address investors concern. Some highlights of the Solar Policy are as follows:

- Setting up of Single Window for expediting the clearances and approvals at various levels, defining its time limit.
- Deemed conversion of Land to NALA status on payment of necessary charges.
- Providing monetary incentives on electricity duty exemption, cross subsidy surcharge exemption, concession or reimbursement of

VAT, and stamp duty registration charges.
- Exemption of transmission and distribution charge for wheeling of power.
- Exemption of supervision charges.
- Enabling additional incentives by providing Deemed Industry status to the solar power projects.

These incentives notified prior to the Bid processes had resulted in a competitive tariff as quoted by the developer. The innovative model of tapping solar generation in the State in a distributed model is attributable to the progressive leadership at TS Discoms and Energy Department. This model has been instrumental in reducing the transmission losses as well as in avoiding upstream investments.

What provisions are being implemented to bridge rural-urban infrastructure gap?

TSSPDCL has been actively working towards increasing the penetration and reach of its network and services in the rural areas. 5.57 lakh additional households were electrified between 2015-16 and 2017-18—most of which comprised from rural areas. Agriculture, the most critical part of rural economics, has been a recipient of many encouraging policy measures. For example, Telangana is providing 24x7 electricity to agricultural consumers—being the first State to commence 24x7 power supply, which is recognised as a major initiative to improve farm productivity and livelihoods in the rural areas.

Meanwhile, safety of power usage is set to improve drastically through avoidance of accidents, as farmers are likely to use the power supply in the daytime. Lift Irrigation Scheme has also been promoted to help farmers improve their income, and bolster the State's performance in agriculture.

"TS Discoms is committed in meeting the objectives of the GoTS to supply 24x7 power supply to all the consumers in the State in a reliable and affordable manner."

How is the State government promoting new & renewable energy? What policies and new initiatives have been undertaken in this regard?

The State has organised many rounds of bidding for solar-based energy generation and has been successful in implementing the projects. A conducive ecosystem is in place for developers to step in and flourish it in a fast forward manner.

How are you bringing Telangana power distribution at par with global standards?

Telangana has always been in the forefront in upgrading its infrastructure and usage of technology to provide reliable power supply to the consumers. The State is free from power shedding. This improved power supply leads to many other benefits such as improvement in productivity for industrial consumers, and quality of life for all consumers in the State.

TSSPDCL is a pioneer in adopting several technological innovation in Energy sectors:
- Company-wide ERP for managing key internal process
- Consumer Analysis Tool (CAT), Monitoring & Tracking system (MATS) to analyse consumer data and improve operations
- Online tracking systems for key consumer interface process like HT applications, Net-metering applications, etc.
- GIS-based consumer indexing and asset mapping

- Driving energy efficiency programs. (11 lakh consumers covered in the CFL and LED replacement program).

How is the ICT-based initiative being approached by the TSSPDCL to tackle power loss and theft across the State?

TSSPDCL, in its endeavor to be the best utility in the country, has been taking a number of initiatives to ensure optimum utilisation of its resources and to seize power loss and theft in the State. Some of the key initiatives are detailed below:

Automatic Meter Reading Modems (AMRs): Enabled with GPRS, AMRs are affixed with Feeder Meters at substations to capture data from the meters of HT and LT high value consumers. Based on this data, reports on voltage failure, current failure, energy loss and deviations in power consumption or demand from the regular trend would be generated—used for taking corrective measures.

Online Prepaid Smart Meters: The architecture is being implemented under TSSPDCL to overcome problems within the existing process, and gain valuable information on consumption patterns which can be used for better grid management and providing differentiated services to consumers. TSSPDCL has placed orders to install about 13,172 Single-phase and 3,712 Three-phase Prepaid Smart Meters for the government and semi-government organisations at a cost of Rs 15.63 crore. It has already installed 1013 Meters as on 05 February, 2018.

Features:

- Remote Meter Reading
- Load profile based management
- Prepaid Metering System
- Demand Side management
- Outage Management
- Peak Load Management
- Auto-Connect/Disconnect

- Remote SMS Alerts
- Remote Health Checks

SCADA/DMS Project: TSSPDCL has launched SCADA/DMS project in Hyderabad Agglomeration area with a tune of Rs 158 crore, which has enabled upgradation of the existed distribution system with realtime supervision and control of 33/11kv substations and 11Kv network. The project envisages automatic control of 228 of 33/11Kv substations and 156 of 11Kv feeders in Hyderabad's core city. In return, the entire power flow in the substations and feeders are remotely viewed and controlled.

The project has helped in rendering uninterrupted 24×7 power supply, thereby enhancing customer satisfaction with the following benefits:

- Identification of exact location of the fault in the network remotely, thereby rectification of the fault is made quick and easy.
- Automatic isolation of the faulty section of the network and restoration of power in the healthy network immediately during the fault.
- Improved voltage/VAR profiles, facilitated proper handling of load shedding & restoration.

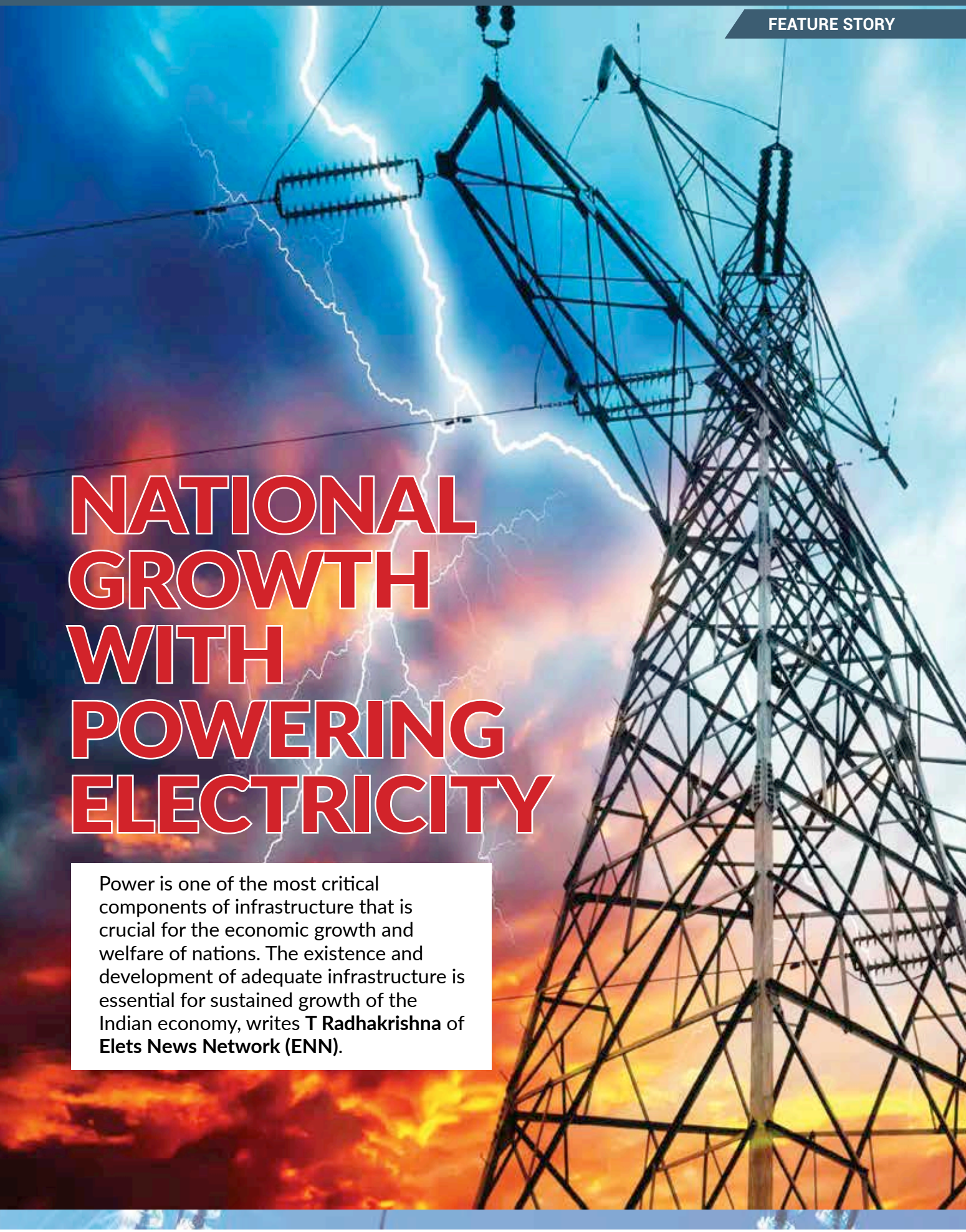
What message do you have for the National Power Summit 2018, Telangana?

I am very glad to be part of the National Power Summit 2018 being organised in Hyderabad, Telangana. I appreciate the organiser, Elets Technomedia Private Limited, for coming up with a platform for sharing knowledge and help explore collaboration with key stakeholders. I thank Energy Department, Government of Telangana and Telangana State Renewable Energy Development Corporation Ltd., for supporting the summit and making it beneficial for all the stakeholders.

TS Discoms is committed in meeting the objectives of the GoTS to supply 24x7 power supply to all the consumers in the State in a reliable and affordable manner. The state of Telangana has moved from an 'Energy deficit' to 'Energy surplus' State in a short time span. We look for the continued support from the Government in making the State of Telangana a model State with best-in class power and other infrastructure.

The global energy landscape is undergoing significant changes due to various technology disruptions. The electricity grid of the future will be increasingly dominated by renewable energy sources, including distributed energy that will be set up closer to the consumers.

I wish the summit to be a great opportunity for a better understanding of the opportunities, challenges and upcoming technologies in the Renewable and Green Energy sector.



NATIONAL GROWTH WITH POWERING ELECTRICITY

Power is one of the most critical components of infrastructure that is crucial for the economic growth and welfare of nations. The existence and development of adequate infrastructure is essential for sustained growth of the Indian economy, writes **T Radhakrishna** of **Elets News Network (ENN)**.

India's power sector is one of the most diversified in the world. Sources of power generation range from conventional sources such as coal, lignite, natural gas, oil, hydro and nuclear power to viable non-conventional sources such as wind, solar, and agricultural and domestic waste. Electricity demand in India has increased rapidly and is expected to rise further in the years to come. In order to meet the increasing demand for electricity in the country, massive addition to the installed generating capacity is required.

India ranks third among 40 countries in Ernst and Young's (EY) Renewable Energy Country Attractiveness Index, on back of strong focus by the Government on promoting renewable energy and implementation of projects in a time bound manner.

India has moved up 73 spots to rank 26th in the World Bank's list of electricity accessibility in 2017, according to Piyush Goyal, Minister of State (Independent Charge) for Power, Coal, Renewable Energy and Mines, Government of India.

In September 2017, the Government of India launched the Saubhagya scheme to provide electricity connections to over 40 million families in rural and urban areas by December 2018 at a cost of $2.5 billion.

Market Size

The sector is undergoing a significant change that has redefined the industry outlook. Sustained economic growth continues to drive electricity demand in India. The Government of India's focus on attaining 'Power for all' has accelerated capacity addition in the country. At the same time, the competitive intensity is increasing at both the market and supply sides (fuel, logistics, finances, and manpower).

The 2026 forecast for India's non-hydro renewable energy capacity has been increased to 155 GW from 130 GW on the back of more than expected solar installation rates and successful wind energy auctions.

Total installed capacity of power stations in India stood at 330,260.53 Megawatt (MW) as on May, 2017. The Ministry of Power has set a target of 1,229.4 billion units (BU) of electricity to be generated in the financial year 2017-18, which is 50 BU's higher than the target for 2016-17. The annual growth rate in renewable energy generation has been estimated to be 27 per cent and 18 per cent for conventional energy. The Government has added 10.2 Giga Watts (GW) of conventional energy generation capacity.

The total solar power capacity addition from new installations in India in the first half of 2017 reached 4,765 MW and has exceeded the total capacity addition done in 2016.

Two under construction hydro projects of NHPC in Himachal Pradesh and Jammu & Kashmir (J&K), expected to be commissioned in 2018, will produce 4,458.69 million units of additional power, according to the Ministry of Power, Government of India.

A total of 13,872 villages out of 18,452 un-electrified villages in India have been electrified up to June 30, 2017 as part of the target to electrify all villages by May 1, 2018.

A total of 26.3 million households which are below poverty line (BPL) have been electrified under the Rural Electrification component of Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY), according to the Ministry of Power, Government of India.

Investment Scenario

Around 293 global and domestic

companies have committed to generate 266 GW of solar, wind, mini-hydel and biomass-based power in India over the next 5–10 years. The initiative would entail an investment of about $310–350 billion. Between April, 2000 and March 2017, the industry attracted $11.59 billion in Foreign Direct Investment (FDI).

Major Developments

International Finance Corporation (IFC), the investment arm of the World Bank Group, is planning to invest about $6 billion through 2022 in several sustainable and renewable energy programmes in India.

- GE Energy Financial Services (GEEFS) plans to invest $90 million to develop a solar power project of 500 megawatt (MW) in partnership with Rattan India Group.
- Greenko Energy Holdings has raised $155 million from its existing investors, Abu Dhabi Investment Authority (ADIA) and Singapore's sovereign wealth fund GIC, which will be utilised for expanding its clean energy portfolio to 3 gigawatts (GW) from 2 GW at present.
- Private equity (PE) investment firm, Actis LLP, is planning to invest about $500 million in Solenergi Power Pvt Ltd, its second renewable energy platform in India.
- Mahindra and Mahindra Ltd is planning to invest in high-end electric powertrain technology in a move towards the future of mobility as well as for the electrification of its existing and future line-up of products.
- Hero Future Energies Private Ltd is planning to foray into the battery storage business and set up solar charging stations for Electric Vehicles (EV) in India to capitalise on India's emerging EV market.
- The Asian Development Bank (ADB) and the Punjab National Bank (PNB) have signed a financing loan worth $100 million, which will be used to support solar rooftop projects on commercial and industrial buildings across India.
- Tata Capital Ltd and International Finance Corporation (IFC) have invested Rs 200 crore ($31.05 million) in their joint venture (JV), Tata Cleantech Capital Ltd (TCCL), to increase its loan book for investing in renewable energy projects.
- CDC Group Plc, a development finance institution, plans to set up its own renewable energy platform in the eastern States of India like Bihar, Odisha and Assam, and other neighbouring countries to focus on developing hundreds of megawatts (MWs) of high-quality greenfield generational capacity.
- Japan's JERA Co. Inc, has acquired a 10 per cent stake in ReNew Power Ventures Pvt. Ltd for $200 million, valuing the company at $2 billion before its proposed Initial Public Offer (IPO).
- The Indian Railways is looking to award six tenders worth Rs 8,000 crores ($1.2 billion), for setting up of a country-wide electricity transmission network, as part of a strategy to reduce electricity bills.
- Renewable energy company ReNew Power has announced securing $390 million debt funding from its existing investor Asian Development Bank (ADB) for developing and expanding capacities of 709 megawatt (MW) across various states of India.
- International Finance Corporation (IFC), along with IFC Global Infrastructure Fund, the private equity fund of IFC Asset Management Company, has announced investment of $125 million equity in Hero Future Energies, which will help the firm set up 1 gigawatt (GW) of greenfield solar and wind power plants over the next one year.

Government Initiatives

The Government of India has identified power sector as a key sector of focus so as to promote sustained industrial growth. Some initiatives by the Government of India to boost the Indian power sector are:

- The 'Pradhan Mantri Sahaj Bijli Har Ghar Yojana', with an outlay of Rs 16,320 crore ($2.51 billion), has been launched by the Government of India with the aim of providing electricity access to over 40 million families in the country by December 2018.
- The Ministry of Environment, Forest and Climate Change, Government of India has clarified that solar PV (photovoltaic) power, solar thermal

power projects, and solar parks will not require the environment clearance which was mandatory under the provisions of Environment Impact Assessment (EIA) notification, 2006.

- By installing three million LED street lights to illuminate 50,000 kilometres of roads in India under the Street Lighting National programme (SLNP), the state-run Energy Efficiency Services Ltd has achieved 390 million kWh in annual energy savings, according to the Ministry of Power, Government of India.
- The Ministry of Power, Government of India, has taken various measures to achieve its aim of providing 24X7 affordable and environment friendly 'Power for All' by 2019, which includes preparation of state specific action plans, and implementation of Green Energy Corridor for transmission of renewable energy, among other measures.
- India has become an associate member of the International Energy Agency (IEA), which makes the Paris-based body more significant, indicating India's growing prominence in playing an important role in the global energy dialogue, according to the IEA.
- The Government of India plans to auction coal blocks for commercial mining by the end of December 2017, which would end the monopoly of state-run firms in coal mining and help in achieving the country's target of producing 1 billion tonnes of coal by 2020.
- The Cabinet Committee on Economic Affairs (CCEA) has approved a new coal linkage policy, aimed at providing necessary supply of fuel to power plants through reverse auction
- The Government of India has announced plans to implement a $ 238 million National Mission on advanced ultra-supercritical technologies for cleaner coal utilisation.
- The Cabinet Committee on Economic Affairs (CCEA) has approved the enhancement of capacity of the Scheme for Development of Solar Parks and Ultra Mega Solar Power Projects from 20,000 megawatt (MW) to 40,000 MW, which will ensure setting up of at least 50 solar parks each with a capacity of 500 MW and above in various parts of the country.
- The Union Cabinet, Government of India has given its ex-post facto approval for signing of a Memorandum of Understanding (MoU) on Renewable Energy between India and Portugal, which will help strengthen the bilateral cooperation between the two countries.
- The Ministry of New and Renewable Energy plans to introduce a fixed-cost component to the tariff for electricity generated from renewable energy sources like solar or wind, in a bid to promote a green economy.
- The Union Cabinet has approved the ratification of International Solar Alliance's (ISA) framework agreement by India, which will provide India a platform to showcase its solar programmes, and put it in a leadership role in climate and renewable energy issues globally.

India could become the world's first country to use LEDs for all lighting needs by 2019, thereby saving Rs 40,000 crore ($ 6.23 billion) on an annual basis. India's solar power capacity addition is forecasted at 9.4 gigawatts (GW) in 2017.

The Road Ahead

The 2026 forecast for India's non-hydro renewable energy capacity has been increased to 155 GW from 130 GW on the back of more than expected solar installation rates and successful wind energy auctions.

India could become the world's first country to use LEDs for all lighting needs by 2019, thereby saving Rs 40,000 crore ($6.23 billion) on an annual basis.

India's solar power capacity addition is forecasted at 9.4 gigawatts (GW) in 2017 which is even higher than the previous estimates of 8.8GW of capacity addition.

The Indian power sector has an investment potential of Rs 15 trillion ($225 billion) in the next 4–5 years, thereby providing immense opportunities in power generation, distribution, transmission, and equipment, according to Union Power Minister Piyush Goyal.

The government's immediate goal is to generate two trillion units (kilowatt hours) of energy by 2019. This means doubling the current production capacity to provide 24x7electricity for residential, industrial, commercial and agriculture use.

The Government has electrified 13,000 villages so far out of the total 18,452 villages and is targeting electrification of all villages by 2019, within the targeted 1,000 days.

The Government of India is taking a number of steps and initiatives like 10-year tax exemption for solar energy projects, etc., in order to achieve India's ambitious renewable energy targets of adding 175 GW of renewable energy, including addition of 100 GW of solar power, by the year 2022. The government has also sought to restart the stalled hydro power projects and increase the wind energy production target to 60 GW by 2022 from the current 20 GW.

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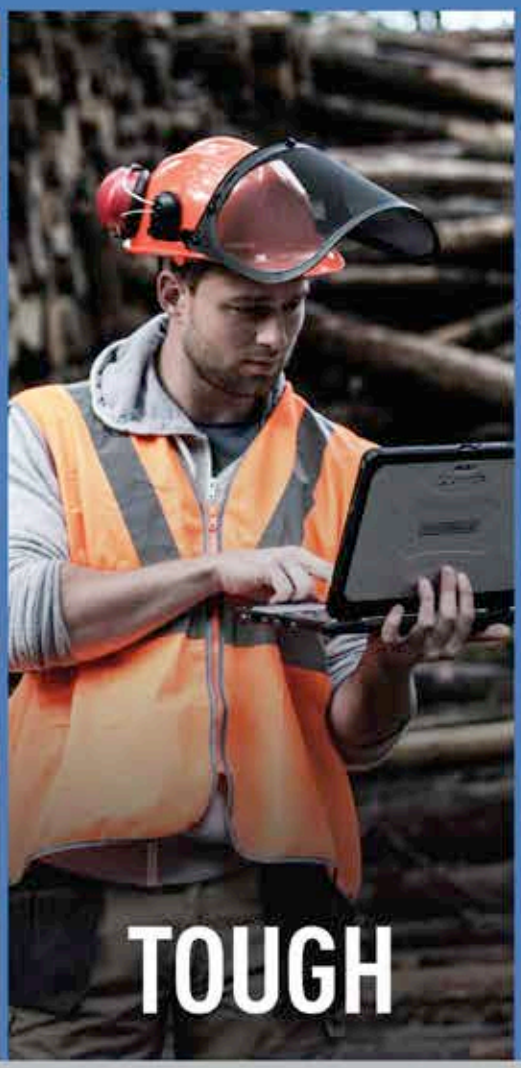

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Clean Energy Changing Power Scenario in India

The Indian Renewable Energy (IRE) sector, which is the second most attractive renewable energy market in the world, ranks fourth in the world in terms of total installed wind power capacity. It added record 11.0 GW in wind and solar power capacity in 2016-17. The focus of Government of India has shifted to clean energy after it ratified the Paris Agreement. As India looks to meet its energy demand on its own, which is expected to reach 15,820 TWh by 2040, renewable energy is set to play an important role, writes T Radhakrishna of Elets News Network (ENN).

With the increased support of government and improved economics, the sector has become attractive from investors perspective and India ranked second in Renewable Energy Attractive Index 2017.

Market Size

Total installed capacity of IRE touched 58.3 GW as of September 2017, which is around 17.7 per cent of total energy capacity of the country (329.3 GW). During September 2017, total installed wind power capacity in the renewables mix stood at 32.5 GW (55.8 per cent), while solar power capacity was 13.1 GW (22.5 per cent). Total solar capacity is expected to touch 18.7 Gigawatt (GW) by the end of 2017, which is about 5 per cent of global solar capacity, and further increase to 8 per cent by 2035. With a potential capacity of 363 gigawatts (GW) and with policies focused on the renewable energy sector, Northern India is expected to become the hub for renewable energy in India.

Investments/ Developments

According to the Department of Industrial Policy and Promotion (DIPP), Government of India, FDI inflows in the Indian non-conventional energy sector between April 2000 and June 2017 stood at $5.9 billion. The Central Electricity Authority (CEA) expects investment in India's power transmission sector to reach Rs 2.6 trillion ($40.3 billion) during the 13th plan (2017-22), and to enhance the transmission capacity of the inter-regional links by 45,700 megawatt (MW).

Major Highlights

Private Equity (PE) investments in India's wind and solar power have increased by 47 per cent in 2017 (January 1 to September 25) to $ 920 million, across nine deals, as compared to $ 630 million coming from 10 deals during the corresponding period in 2016.

- JSW Energy signed Memorandum of Understanding (MoU) with the Government of Gujarat for setting up an electric vehicle (EV) manufacturing unit in Gujarat at an estimated cost of Rs 4,000 crore ($608.88 million).

- Tata Capital Ltd and International Finance Corporation (IFC) invested Rs 200 crore ($31.0 million) in their joint venture (JV), Tata Cleantech Capital Ltd (TCCL), to increase its loan book for investing in renewable energy projects.

- The Asian Development Bank (ADB) and the Punjab National Bank (PNB) signed a financing loan worth $ 100 million, which will be used to support solar rooftop projects on commercial and industrial buildings across India.
- India's first ever multi-modal electric vehicle project has been launched at Nagpur, which will bring together a fleet of 200 electric vehicles including taxis, buses, e-rickshaw and auto rickshaws, on cab aggregator Ola's app platform in Nagpur.
- Private equity (PE) investment firm, Actis LLP, is planning to invest about $ 500 million in Solenergi Power Pvt Ltd, its second renewable energy platform in India.
- Larsen & Toubro (L&T) Construction bagged an order worth Rs 5,250 crore ($ 814.6 million) from Qatar General Electricity and Water Corporation (Kahramaa) for electricity transmission and expansion of network.
- The Government of India and the Asian Development Bank (ADB) signed a loan agreement for $ 175 million to be provided to Power Grid Corporation of India Ltd (PGCIL) for construction of interstate transmission systems for solar power projects which will enable

the transfer of surplus solar energy to power-deficit states.

- The Government of India and the Government of UK plan to jointly invest up to GBP 240 million ($ 298.95 million) in an India-UK fund, which will invest in India's energy and renewables sector.
- Greenko Energy Holdings has raised $155 million from its existing investors, Abu Dhabi Investment Authority (ADIA) and Singapore's sovereign wealth fund GIC, which will be utilised for expanding its clean energy portfolio to 3 gigawatts (GW) from 2 GW at present.
- Renewable energy company ReNew Power has announced securing $390 million debt funding from its existing investor Asian Development Bank (ADB), and will use the funds to develop and expand capacities of 709 megawatt (MW) across various states of India.

Government initiatives

Some initiatives by the Government of India to boost the Indian renewable energy sector are as follows:

- The Government of Maharashtra plans to set up a 500 MW capacity solar park in its Dhule district with private bids planned in FY18 and has already selected 1,000 acres of land for the first phase of the project.
- The Government of India announced plans to implement a $ 238 million National Mission on advanced ultra-supercritical technologies for cleaner coal utilisation.
- The Ministry of New and Renewable Energy (MNRE), Government of India decided to provide custom and excise duty benefits to the solar rooftop sector, which in turn will lower the cost of setting up as well as generate power, thus boosting growth.
- The Indian Railways is taking increased efforts through sustained energy efficient measures and maximum use of clean fuel to cut down emission level by 33 per cent by 2030.
- The Union Cabinet approved raising of bonds worth Rs 2,360 crore ($ 366.2 million) by the Indian Renewable Energy Development Agency (IREDA), which will be used in various renewable energy projects in FY 2017-18.
- The Union Cabinet approved construction of 10 units of indigenous Pressurised Heavy Water Reactors (PHWR), with a nuclear capacity of 700 MW each, which is expected to bring substantial economies of scale and maximise cost and time efficiencies, and thereby boost India's nuclear industry.

It is expected that by the year 2040, around 49 per cent of the total electricity will be generated by the renewable energy, as more efficient batteries will be used to store electricity which will further cut the solar energy cost by 66 per cent as compared to the current cost.

Road Ahead

The Government of India is committed to increased use of clean energy sources and is already undertaking various large-scale sustainable power projects and promoting green energy heavily. In addition, renewable energy has the potential to create many employment opportunities at all levels, especially in rural areas. The Ministry of New and Renewable Energy (MNRE) has set an ambitious target to set up renewable energy capacities to the tune of 175 GW by 2022 of which about 100 GW is planned for solar, 60 for wind and other for hydro, bio among other. It is expected that by the year 2040, around 49 per cent of the total electricity will be generated by the renewable energy, as more efficient batteries will be used to store electricity which will further cut the solar energy cost by 66 per cent as compared to the current cost.

Hemant Sharma
Commissioner-cum-Secretary
Department of Energy
Government of Odisha

ODISHA Redefining **POWER GENERATION** Landscape

Underground power cabling has been successfully completed in Puri and similar significant temple areas in Bhubaneswar, Baripada and Sambalpur with an expenditure of around Rs 210 crore, says **Hemant Sharma**, Commissioner-cum-Secretary, Department of Energy, Government of Odisha in conversation with **Biswajit Sahoo** of **Elets News Network (ENN).**

"The State is also envisaging to implement fully functional enterprise resource planning (ERP) system in the power sector organisations for smoother operation, better management and increasing efficiency."

The Government of Odisha has committed 'Power for All' plan to electrify all villages of the State, what is your mission and action plan?

We have almost achieved 100 per cent village electrification in the State as per 2011 census (i.e. nearly 48,000 villages). Infrastructure strengthening works in some 20,000 odd partially-electrified (PE) villages as against the scope of 32,000 PE villages are under progress and the completion target is October, 2018. With regard to electrification households, by now we have completed 68 lakh households and remaining 28 lakh households (which includes approximately 13 lakh BPL households) are in the process of extending electricity connections.

Works are being taken up by Central Public Sector Undertakings like NTPC (National Thermal Power Corporation) and PGCIL (Power Grid Corporation of India Ltd) and State owned PSU OPTCL under RGGVY-12th Plan and DDUGJY (Deen Dayal Upadhyaya Gram Jyoti Yojana) programmes. Though the action plan has been drawn in tandem with 24x7 Power For All (PFA) programme, but we are aiming to achieve the desired results prior to March 2019. Additionally, adequate planning has also been done for supporting

infrastructure in the Sub-Transmission, Transmission and Generation segments.

Odisha has been a power surplus State for fairly longer period due to its abundant coal reserve and water resources. What are your plans for augmentation in power production through State agencies like OPGC and newly formed OTPCL?

The cumulative installed capacity in Odisha is around 9000 MW including the share from central generating stations. Existing maximum demand of Odisha is around 4500 MW and present annual energy requirement of the State is of the order of 25,000 million units approximately. The maximum demand is expected to increase to around 5,200 MW with annual energy requirement of approximately 35,000 million units by 2020, taking into account additional energy requirement for providing 24x7 power supply to the State over the normal load growth.

Planning has been done for addition of 4,900 MW capacity by 2022 (i.e. 1300 MW from Ultra Mega Power Plant at Bhedabahal, Sundargarh, 800 MW from NTPC expansion project at Darlipali and 2100 MW from IPPs). Besides, State is implementing 2x660 MW Unit-3 & 4 expansion project of OPGC at IB, Jharsuguda. The first Unit is planned to be commissioned in this financial year. Another State owned PSU, Odisha Thermal Power Corporation (OTPC) will develop 3x800 MW coal based super critical thermal power plant at Kamakhyanagar in Dhenkanal district. Additional 2,400 MW firm power is expected to be available by 2020, supplying 18,000 million units annually.

Energy Department has taken up an ambitious plan of underground power cable for safe electricity transmission in Bhubaneswar and Cuttack after Puri. What are the project costs and how it will add efficiency towards a robust power distribution system?

Underground power cabling has been successfully completed in Puri and similar significant temple areas in Bhubaneswar, Baripada and Sambalpur with an expenditure of around Rs 210 crore. The State Capital Region Improvement of Power System (SCRIPS) envisages to meet energy needs of the State capital region up to 2030, ensuring 24x7 uninterrupted, reliable and stable power supply in the geographical areas covering under the comprehensive development plan for Bhubaneswar and Cuttack urban complex. Scope of SCRIPS includes setting up of GIS grid stations and GIS 33/11 KV S/s, underground cabling of 132 kV and below voltage level lines and conversion of overhead transmission ACSR conductors to HTLS with an estimated project cost of Rs 1,500 crore. Automation and use of Smart Grid technology will ensure more reliable, efficient and cost effective transmission of electricity even during extreme weather conditions.

Odisha has also created GEDCOL in addition to OREDA for producing and harnessing green energy in the State. How is it aligned with the National Solar Mission?

GEDCOL has been created as a 100 per cent subsidiary company of Odisha Hydro Power Corporation Ltd. (OHPC) in the year 2013. It is functioning as the State Nodal Agency for development of all on-grid Solar and Hybrid power projects of 1 MW and above capacity. OREDA is the nodal agency for all other Renewable Energy projects except Small Hydro Electric projects, which is being looked after by the Engineer-in-Chief (Electricity).

Energy Department has notified the Odisha Renewable Energy Policy, 2016 in November, 2016, envisaging the overall renewable capacity addition target as 2,750 MW by 2022, as part of the national target of 175GW Renewable Energy capacity by 2022.

GEDCOL has commissioned a 20 MW Solar power project at Manamunda in Boudh district under NSM (Phase-II, Batch-I). GEDCOL is also implementing 1000 MW Solar Park in the State (in two phases) under the UMSPP scheme of MNRE. In the Rooftop Solar segment, 4 MW Rooftop Solar project is nearing completion on the Government buildings in Bhubaneswar and Cuttack and survey has been completed in 15 other towns for around 18 MW Rooftop capacity. Several other small hydro and solar activities are also in offing, which will be taken up by GEDCOL in the State.

The company has gained first-hand exposure by venturing into development of several projects and we are quite hopeful that the company will strive towards newer heights in the on-grid solar space of the country.

What are State's plan to increase efficiency and profitability of Discoms?

Being a rural population dominated State, achieving quick profitability of Discoms is very challenging. However, the department is taking up multifaceted programmes for reduction of AT&C loss and thereby increasing the efficiency of utilities, viz, 100 per cent LT billing, feeder metering, distribution transformer metering and energy audit, HVDS and LT AB cabling, installation of smart metres for all consumers above 500 kWh/month (except agricultural category consumers), LED distribution and installation of energy efficient pumps, KPI based performance monitoring and management system of loss reduction and meter replacement, ERP for metering, billing, collection, inventory and accounts management, centralised customer centres, new avenues for consumer bill payment (i.e. e-payment through net banking, credit/debit card, kiosks at banks and post offices, village panchayats, mobile collection vans etc.) and capacity building and consumer awareness campaigns etc. We are planning for an overall loss reduction of 4-5 per cent per annum at the State level as per the 24x7 Power For All joint statement.

Have you embraced IT and Internet of Things (IoT) technologies, smart metres and electricity distribution automation system to optimise the power distribution system?

We have implemented need based IT-based applications in the distribution utilities. The in-house IT cells have developed and successfully implemented software modules and mobile applications for new connection, meter installation and meter seal management, spot billing system, android based mobile photo billing, payment collection system including online modes, data centre management, mailing service, training and development module and recruitment web-portal etc, which have yielded the desired results. Besides, a new app is under development for electrical safety, to minimise accidents. The State utilities have also implemented AMR for all consumers above 10 KW, computerised cash collection centres, installation of prepaid meters for government consumers and smart meter pilot projects in selected areas.

Energy tariffs are very competitive and cheap in Odisha in comparison to other States. Does the energy department have any specific industry tariffs or packages for industry clusters?

Odisha's tariff structure is at a lower side when compared with the national level statistics owing to good Hydro-Thermal mix. At present, the ddepartment is not resorting to specific tariff subsidies to the industry clusters, rather facilitating various fiscal and other incentives and concessions through different sectoral polices of the State Government like SEZ, IPR, ICT and ESDM and Renewable Energy Policy etc for promotion of sector specific industries. Massive financial assistance is being provided for upgradation of transmission and distribution systems, which is primarily in the nature of capital subsidy to keep the tariff low for all categories of consumers.

What other special initiatives have been undertaken by the Energy department in the State which will benefit the consumers in the last mile and increase productivity of the sector?

The State is prone to natural disasters like cyclones and floods, which affects the power system infrastructure majorly. In addition to integrate the desired resiliency in the power system along with enhancement of quality and reliability index of power supply, the State has planned to take up several special automation and modernisation projects like Radial to Ring Conversion Project (RRCP) with an aim to reduce interruptions by providing multi source connectivity, Disaster Resilient Power System (DRPS) to reduce damages to the transmission and distribution infrastructure during natural disasters, Disaster Response Centre (DRC) for quick restoration of power supply after natural disasters, Smart Grid technology to ensure more reliable, efficient and cost effective transmission of electricity by introducing new concept like advance metering infrastructure (AMI) for metering and billing automation, Geographical Information System (GIS) for asset mapping, Supervisory Control and Data Acquisition (SCADA) for system automation and remote controlling, use of Optical Fibre Composite Overhead Ground Wire (OPGW) in place of earth wire for establishing easy and faster communication network and lightning protection, fault locators and audit metering etc in the system.

Apart from above, the State is also envisaging to implement fully functional enterprise resource planning (ERP) system in the power sector organisations for smoother operation, better management and increasing efficiency.

Collectively, the estimated expenditure for all these special interventions would be around Rs 2,500 crore. The State has made adequate planning and resource allocation to make the power sector environmentally and commercially sustainable and providing quality and reliable power supply to the last mile consumers with no discrimination among rural and urban areas in the coming years.

Vivek Naidu
Vice-President
Information Management (India Cluster)
Kodak Alaris India Pvt. Ltd.

Kodak Alaris Revolutionising **India's Information Management Industry**

Successes that are happening one after another are definitely creating a platform for the technology vendors to participate, ensuring the proofs of technology are spread across the country, says **Vivek Naidu**, Vice-President, Information Management (India Cluster), Kodak Alaris India Pvt. Ltd., in a conversation with **Arpit Gupta** of **Elets News Network (ENN)**.

"We've been a very significant partner in States like Gujarat, Andhra Pradesh, Telangana, Delhi, Uttar Pradesh, Maharashtra, to name a few. Our focus is to participate and enable all the mission-mode projects covering the length and breadth of the country."

Give us an overview of Kodak Alaris Information Management, India.

Kodak Alaris is at the forefront of global revolution around Information Management (IM) and the future of digital transformation in India is extremely promising from the stand point of data adoption.

Enterprises today deal with information in various forms and sizes. Traditionally, it used to be paper-based information, but in last 10-12 years, we've seen the influx of fax and email and now the social media. Moreover, the amount of data that has been generated in the past two years itself is more than what mankind has generated in all the years. The inability to harness this data leads to complexity and loss in productivity. This presents companies with a humongous challenge to tap into the value of their data through efficient digitalisation. The question is not whether the shift to digital needs to be made, but more importantly, where do companies begin? The answer is simple: digital transformation starts with information capture – the challenge Kodak Alaris solves better than anyone.

IM encompasses all channels of information, which can be of value for an enterprise to have an impact on business outcomes. Kodak Alaris deals with this discipline with an aim of providing simplicity and ease-of-use, enabling enterprises to capture information from all forms and channels. Since there is an ingress of information from channels other than paper, we've diversified our outlook—digitising it, becoming the subset of Information Management.

As far as end-to-end capture of information is concerned, every piece of information has to be secured. How secure are your products and solutions?

The first parameter that all technology vendors must follow to ensure security of information is to provide services as per global standards. Every piece of information we obtain whether on paper or via social media channels must comply with global standards. For instance, when creating images from papers in a specific format (Eg. pdf, tiff—which are fully secured and adhere to global standards), does not allow the user to edit any part of an image thereby preventing any form of

distortion of the digital copy. Kodak Alaris conforms to all the global standards on inter-operability as well other security protocols.

Elaborate on initiatives introduced by Kodak Alaris in 2017.

We introduced IN2 Ecosystem with an aim to provide simplicity and ease-of-use to the end-customer. It is primarily an ecosystem of partners which include

- Independent Software Vendors (ISV)
- Business Process Outsource (BPO)
- System Integrator (SI)

Typically, when customers embark on the digitisation journey, they look for a holistic set of solutions from their partners who can provide technical competence of integrating all the pieces of solutions as well as provides the benefit of ease of doing business. Based on our experience, we have created a network of partners who can provide software packages to customers in areas like healthcare, payment banks, manufacturing etc. We have stitched together a network of partners who specialise in different areas. Depending on the priorities of customers, we deploy a particular set of partners to engage with them. It is a win-win situation for partners, customers as well as Kodak Alaris. We achieved great success through the IN2 Ecosystem platform.

In 2018, we are creating verticalised solutions for industry domains whose focus primarily is distributed scanning environment (organisations that have multi–location footprint or have a larger geographical coverage). The focus is on vertical applications to capture distributed yet Indian market for scanning products is growing, and in order to capture the market segment, we are focussing on partnerships with ISVs with verticalised solution.

In terms of innovation, Kodak Alaris launched a new category of scanners in 2017 called S2000 series with unique features such as Embedded Image Processing, Active Feed Technology and Controlled Output Scanning. The S2000 series includes two USB-connected models – Alaris S2050 and S2070 and two network/wireless models – Alaris S2060w and S2080w which deliver rated speeds between 50 Pages per Minute (PPM) and 80 ppm.

Infact, our focus on the Digital India programme has increased all the more. The government sector in particular is transforming from a paper-based economy to adopting digital technologies like the e-office project which brings in digitisation at the core of every business operation. With a vision of creating a 'transparent electronic marketplace' the government is investing on various IT products which presents a big opportunity for scanners and information management.

What challenges and opportunities do you see underlying for the Information Management Industry?

The first key challenge is the size and scale of the task of digitisation in 'Digital India'. We have been working closely with the Government on this front and in one the digitising projects we undertook, land record documents dated back to the year 1850 have been digitized. Imagine, the volume of digitisation required for the papers starting since 1850. Secondly, adoption takes time, especially in a developing country like India. Thirdly, more investment is required. Digitisation of papers is just one part of the whole value chain. The more important part is how this can be deployed for the benefit of the citizens. Although the Government has rolled-out an innovative and tech-savvy idea around deployment of G2C (Government to Citizen) services, implementing it across the entire spectrum will require huge investments. The digitisation of Regional Transport Office (RTO), for instance, has brought a lot of transparency in operation. The challenge is of scale, adoption and seeking investment, however the opportunity for technology vendors lies in the intent of the government to usher digitisation. We also see opportunity in the fact that, successes that are happening one after another are definitely creating a platform for the technology vendors to participate, ensuring the fruits of technology are spread across the country.

The Government is promoting ease-of-doing business across all States/UTs. Which are the States you're looking to expand your company's wing?

We've been significant number of partners in States like Gujarat, Andhra Pradesh, Telangana, Delhi, Uttar Pradesh, Maharashtra, to name a few. Our focus however is to participate and enable all the mission-mode projects which by definition itself is covering the length and breadth of the country. At present, we're participating in the digital PR project in Kerala. Prior to this, we participated in a project for the High Courts of Punjab and Haryana.

Given the intensity of these projects, one cannot reach completion in a single financial year, hence we target an investment cycle of three to four financial years for a particular State and then the cycle moves to the next state. We have a very secular approach to expand our coverage, and our focus is to participate in all the 29 States and the UTs. However, keeping in mind the business reality and prioritisation, at any given point about seven to eight States remain in focus for 2-3 financial years and then the cycle moves forward.

Nikhil Bagalkotkar
Presales Head – Virtualisation, Citrix India

Citrix Transforming Businesses Digitally

With digitisation aiding mobile working, the Government stands to gain in terms of agility of managing data while working away from the traditional work station, says **Nikhil Bagalkotkar**, Presales Head – Virtualisation, Citrix India, in conversation with **Arpit Gupta** of **Elets News Network (ENN)**.

"Citrix's advanced secure-by-design and software defined network offerings are equipped to counter the issue at hand and help administrative offices strike the right balance between data protection and user productivity."

How will increase in adoption of virtualisation and cloud by the Government machineries help realise the Digital India dream of Prime Minister Narendra Modi?

With the Indian Government being at the epicenter of the digitisation movement, administrative machineries are increasingly adopting newer technologies to reap benefits due to improved efficiency and flexibility it offers.

With this backdrop, it is safe to say that the benefits of these technologies have positively influenced governmental entities' decision to take the digitisation leap. With this transition, they not only stand to work with simplified processes and improved delivery of services, but also reduce administrative costs. Additionally, considering the nature of sensitive data being dealt with, Cloud and specially a multi-cloud strategy has grown to be the preferred alternative. With data no longer being restricted to a single legacy software, Government agencies now have more control to exercise. This, in turn, has enhanced the overall fabric of security.

How does the Government stand to gain from transitioning to digital workspaces? Please throw some light on the challenges and roadblocks faced by the Government in their digital transformation endeavour.

While serving the nation, the Government employees are at times required to work remotely from various locations. In such a scenario, it becomes necessary for these employees to have

easy access to their data on the go. With digitisation aiding mobile working, the Government stands to gain in terms of agility of managing data while working away from the traditional work station.

Though the focus of the Government sector for digitisation is to simplify their processes, it is possible that the security aspect may get overlooked. With technology leading the way and digital solutions becoming standard, it is important to consider that this transition may encourage malicious external agents. Therefore, it is critical for the IT function to step in and ensure a layer of security is integrated into their IT skeleton.

What is the current state of Cloud and mobility solutions' adoption in the public sector?

In the last couple of years, the Government of India has been going strong in terms of its adoption of digital solutions. According to Gartner, the IT spends in the Government sector in India is projected to touch $8.5 billion in 2018. Off this, IT services will comprise about a quarter of the total spend indicating a clear focus on providing a host of digital services across user segments.

With this in the background, 2018 is expected to be a year dominated by cloud, mobility, and digitally-enabled workspace. Another factor that will play a role in adoption of technology is the number of younger, tech-savvy professionals replacing the older generation of government employees. This provision of conducive infrastructure that supports employees' mobility need has led to restructing of their IT infrastructure.

Citrix solutions are in use by more than four lakh organisations including 99 per cent of the Fortune 100 and 98 percent of the Fortune 500. How can Citrix help Government agencies to transform digitally?

Citrix's has been vocal about its resolve to support the private and public sector in their bid to transform digitally. With a range of innovative solutions, Citrix is enabling entities to shift to a reality of simplified processes. Considering the scale and fragmented nature of operations in a bureaucratic unit, Citrix's digital workspace is favourably positioned to allow for monitoring and management of an organisation's entire technology infrastructure through a unified single glass pane.

With data and applications no longer being confined to the Government data centre, effective deployment of a security perimeter defined by software is necessary. Additionally, with incidences of data breach gathering momentum, the Indian Government needs to find an approach that ensures information protection without restricting employees' freedom to use their preferred devices and connections to access Government resources. Citrix's advanced secure-by-design and software defined network offerings are equipped to counter this issue at hand and help administrative offices strike the right balance between data protection and user productivity.

Please share your views on the integration of Cloud, hybrid-Cloud into government IT infrastructure and the emerging need to safeguard the information stored.

Cloud as a technology has been a game changer. Its deployment has not only automated and simplified everyday processes but also provided advantage of flexibility wherein employees enjoy the option of accessing data from any location, and device. Besides streamlining of processes, the technology has enhanced the overall operational efficiency and output quality. This transition, therefore, has helped the Indian government to contain time invested in routine activities and focus their attention on enhancing customer engagement. Furthermore, with the hybrid cloud ecosystem developing, Indian government now has the option of storing data across public, private or a combination of public and private Cloud platforms depending on their degree of sensitivity required.

With increased instances of sophisticated cyber-attacks, it has become critical for the Indian Government to evaluate their storage strategy to ensure confidential data is not made susceptible to criminal intents. Therefore, a hybrid cloud set-up is gradually gaining acceptance as it provides benefits of both public and private cloud.

What are Citrix's plans for 2018?

India is a strategic market for Citrix and with cloud adoption seeing an upward trend, we are bullish on supporting businesses transform digitally. Our presence in the Indian market over the years has made us aware of businesses' hesitation regarding disruptive technologies. We intend on utilising this knowledge to address their concerns and provide transformative solutions in Cloud, Mobility, and Virtualisation.

With digitisation becoming an inevitable reality for businesses in India, we expect demand for secure apps and solutions to soar. We at Citrix, see this development as an important stepping stone for us to expand further and develop solutions that will aid their transition to a simpler, more controlled technology infrastructure. Lastly, we have always been vocal about being a channel-drive organisation and our emphasis on strengthening our partner network will only grow going forward.

RENEWABLE ENERGY: Ensuring Abundant, Sustainable Power for all Indians

India has witnessed extensive growth in renewable energy deployment, with capacity having doubled in the past five years. About one-fourth of the total installed renewable energy capacity has been added in the past two years alone.

The Government's focus and persistence in drafting sector-specific policy and regulatory interventions have cemented India's position as the fifth largest country in renewable energy deployment, with about 60 GW of installed renewable energy capacity.

These initiatives include offtake arrangements under the Jawaharlal Nehru National Solar Mission by the Solar Energy Corporation of India (SECI)/NTPC (both parties to the Government's tripartite agreements), Ujwal Discom Assurance Yojana (UDAY), solar park schemes and SECI's recent interstate transmission system-based wind power auctions.

However, the effective implementation of strategic initiatives such as Make in India, stricter renewable purchase obligation compliance and ramping up of existing transmission network will be increasingly crucial for achieving the ambitious target of 175 GW of renewable energy capacity by 2022.

FY17-18 has been remarkable for the Indian renewable energy sector as it witnessed introduction of innovative financing models and technical optimisation practices, warranted by national and global projects. Trends indicate that globally, institutional investors are placing their trust in the renewable energy sector's growth trajectory, leading to an increase in partnerships.

With the Government charting out a clear roadmap for new renewable energy project biddings, stakeholders are eagerly monitoring developments in the project allocation space. Steadfast traction by developers in the green bond market has been crucial for the continued appetite of the banking industry in taking greenfield project exposures.

Green bonds are emerging as one of the most prevalent debt capital market instruments, besides conventional bank financing, for funding climate solutions in India.

YES BANK was the first bank to issue green bonds in the country in February 2015, paving the way forward for other issuers. The massive capital requirements for the growth of renewable energy sector in India calls for leveraging a broader investor audience, including pension funds, insurance companies and sovereign funds amongst others, all of which are progressively moving from conventional energy assets to greener and cleaner technology solutions.

The global push towards e-mobility is one such example, wherein we can expect to see increased traction and opportunities forbusiness models and institutional investment, integrating clean energy technologies with e-mobility solutions.

The Government has been taking key measures, leading to an improvement in the bankability of the sector – right from the transformational NTPC bundling scheme in 2010, which aimed at negating the then existing tariff gap, to the implementation of the solar parks model to scale up capacity deployment.

Further, on the demand side, UDAY has gained significant traction over the past two years, with 31 States and union territories joining the ranks and with 86 per cent of debt-restructured bonds issued for 16 major participating States. Grid-connected rooftop solar and distributed renewable generation assets form a significant part of the Government's 175 GW target, with 40 GW envisaged from small- to medium-scale installations.

While India crossed the 1 GW mark in 2016, the year 2016-17 also saw an annual growth of about 80 per cent in rooftop solar development. Leading the pack were commercial and industrial segments, where there is both adequate demand as well as economic viability. Solar rooftop is also witnessing significant interest in third-party off-take arrangements.

This has been possible due to favourable policy measures such as priority sector lending norms, capital subsidy, net metering schemes and better access to financing from multilateral institutions. Currently, there are challenges with regard to the standardisation of contracts, individual borrower-level credit profiles and adequate security coverage, which needs to be addressed for the growth of the renewable energy sector.

It is imperative to establish manufacturing hubs and R&D centers for low-cost renewable energy technology to establish domestic capability likely to meet large renewable energy targets. Further, designing a competitive Renewable Energy Certificate (REC) market will create economic efficiency and promote optimal investments.

Removal of distortions and impediments that discourage investment is also vital. Fee/tax structure and regulatory philosophy should be consistent with the overall policies and should provide a level playing field to all players, whether public or private. Together, these initiatives will play a key role in furthering India's RE objectives and meeting the country's ambitious RE targets.

With abundant renewable resources, India has the potential to be amongst the top 3 countries globally in the next 5 years in terms of installed capacity, thereby creating millions of new jobs, reducing poverty and achieving sustained socio-economic development.

The Government's bold initiatives, coupled with proactive involvement of industry, global investments and technology cooperation will be catalysts for achieving Energy Security for our 1.25 billion citizens by 2020.

INDIA bole YES to Renewable Energy

YES BANK

Committed to Financing 5 GW of Renewable Energy Projects by 2020

Our Credentials

- Cumulatively funded over **3,700 MW** of Renewable Energy capacity in India
- 1st Indian Bank to be a **Signatory** to **UNEP – Finance Initiative** since 2006 and only Indian Bank to be an active **Signatory** to **Global Compact Network India** since 2009
- **Knowledge Partner** for Renewable Energy Global Investment Promotion Meet & Expo (**RE-Invest**) and **International Solar Alliance (ISA)**
- Hat-trick of bond issuances - **First commercial Indian Bank** to issue Green Infrastructure Bonds (approx. **INR 16.50 bn** till date, subscribed by likes of IFC & FMO)
- Concluded around **33 investment banking transactions** in sustainability sectors cumulating to over **7.5 bn** in value
- Strategic MoU with **London Stock Exchange** to list **Green Bonds** of up to **USD 500 mn**
- **Strategic MoU with Indian Renewable Energy Development Agency (IREDA)** for actualizing the Government's mission of **175 GW** of clean energy by 2022
- Committed to mobilize **USD5 bn** towards climate action in India by 2020, at COP21,Paris in 2015

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Corporate Social Responsibility, 2015 & 2013
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The Karlsruhe Sustainable Finance Awards

Karlsruhe Sustainable Finance Awards, Germany

Best Innovation & Sustainable Financial Products & Services, 2017, 2016

Outstanding Business Sustainability Achievement, 2015 & 2013

Outstanding Sustainable Project Financing, 2014

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IFC International Finance Corporation World Bank Group

Sustainable Bank of the Year - Asia/Pacific, 2012, 2011
No.1 Emerging Markets Sustainable Bank of the Year - Asia, 2008

Best Renewable Energy Deal (Solar) India, 2016
Best Green bond Facility Highly commended India, 2016
Renewable Energy deal of the Year, 2015

MSCI ESG

AAA rating for Environment, Social and Governance Excellence
MSCI ESG, 2016

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K T Rama Rao, IT, Industries, Municipal Administration, Mines & Geology, and NRI Affairs Minister, Telangana inaugurating the National Waste Management Summit, Hyderabad

When Hyderabad Deliberated on Waste Management

In an endeavour to recognise Effective Waste Management as the need of the hour, the Greater Hyderabad Municipal Corporation (GHMC), Government of Telangana, along with Elets Technomedia Pvt Ltd organised a national summit – 'Innovation of Waste Management' in Hyderabad.

The key subjects of discussions of conclave held in June, 2017 included Best Governance Practices of Waste Management: Challenges & Opportunities, Moving Forward with Sustainable Waste Management, PPP Models in Local Government Development and CSR in Waste Management, Wealth out of Waste: Redefining Waste Management Scenario.

The deliberations centred around waste management cleanliness and waste management cleanliness and need of sanitation and challenges, solutions, and initiatives.

Officials from Ministry, Municipal Administration and Urban Development, Industries, Environment, and top officials across various departments of State Government along with foreign dignitaries participated in the event.

It served as a prominent platform for industry leaders and the exhibitors to highlight their special solutions.

During the event, KT Rama Rao, IT, Industries, Municipal Administration, Mines & Geology, & NRI Affairs Minister, Telangana felicitated the leaders practicing the best innovation in waste management and sanitation.

The conference was a unique forum for knowledge sharing, networking, exploring opportunities for collaboration and new business avenues, while setting the policy agenda to meet future challenges in waste management.

"We have launched a programme of recognition and rewarding. On the first Saturday of every month, we recognise the best workers of the best corporations. Today in a connected world, comparisons are drawn with the best of the world. We also need private companies to partner with us join hands with us so that we segregate the waste at the right source."

KT RAMA RAO
IT, Industries, Municipal Administration, Mines & Geology, and NRI Affairs Minister

K T Rama Rao and other dignitaries unveiling the special issue of eGov magazine on Waste Management

INAUGURAL SESSION

Dignitaries at the inaugural session

NAVIN MITTAL
Secretary, Municipal Administration and Urban Development
Government of Telangana

"Waste Management is an extremely important activity in urban governance, which has to be carried-out to make life of the citizens prosperous as well as dignified. Hyderabad has shown a tremendous performance through programmes like 'Swachh Auto Tippers', 'faecal sludge treatment plant', for other cities to follow, etc."

V RADHA
Joint Secretary,
Ministry of Drinking Water and Sanitation,
Government of India

"Technologies have been chosen understanding the capex-opex, geographical location etc, instead of choosing something randomly or in private interest. Technology, manpower, capacity building are the pillars for making the polluter pay."

BEST GOVERNANCE PRACTICES OF WASTE MANAGEMENT: CHALLENGES & OPPORTUNITIES

Session on Best Governance Practices of Waste Management: Challenges & Opportunities

TERESA BARRES
Counsellor for Agriculture and Fisheries Food and Environment, Embassy of Spain, New Delhi

"Prevention is the cheapest way to manage waste. Market placing of product, its reuse and use, and production of waste, are similar to promoting jobs, promoting economy, promoting self-employment, and promoting services. Similarly, inspection, monitoring, control and penalty are equally important."

S SIVASUBRAMANIAN
Commissioner, Tirunelveli City Municipal Corporation, Government of Tamil Nadu

"We've engaged our staffs in 'source segregation'. We've asked all the organisations, religious bodies, etc, to do source segregation on their own. We don't collect from corporate sectors. Now, the bulk generators have started to reduce and reuse the waste."

M NAGARAJAN
Deputy Commissioner, Surat Municipal Corporation and CEO, Surat Smart City Development Limited (SSCDL)

"Surat has the reputation of being one of the cleanest city in the country. It ranked fourth in the Swachh Survekshan-2017. We give grants to societies who are managing their own waste through 'Anudan' scheme. We have around 1,000 waste energy projects.

DR B JANARDHAN REDDY
Commissioner, Greater Hyderabad Municipal Corporation (GHMC)

"Everyday, the quantity of garbage collected is increasing due to an improved system. A major contribution GHMC has made is removing the bins from the streets, so that the garbage is collected from door-to-door and taken to the transfer station after which, it is shifted to the bigger lorry. Almost 500 lorries are plying everyday."

GOURAV LORIA
Group Head, Quality and Operations, Apollo Hospitals

"Healthcare requires top management commitment—its understanding on segregation and its effect on society. Continuous monitoring is the key to sustenance to ensure what we want to implement, gets implemented."

DR S CHANDRASEKHAR
Director
CSIR--IICT
Government of India

"The Solid Waste Management Rules-2016 should be strictly implemented so that the technologists can play a role. If all the organic waste generated in India could be converted into compost and biogas, the latter can replace the LPG."

MOVING FORWARD WITH SUSTAINABLE WASTE MANAGEMENT

Speakers discussing sustainable waste management methods

UP INVESTORS SUMMIT 2018

POWERING NEW INDIA

21-22 February | Lucknow

The Government of Uttar Pradesh is all set to host the Uttar Pradesh Investors Summit 2018 from 21 - 22 February in Lucknow.

The Summit will serve as a global platform, bringing together various Heads of States and Governments, Ministers, Corporate Leaders, Senior Policymakers, Heads of International Institutions and Academic luminaries from around the world to further the cause of economic development in Uttar Pradesh and promote cooperation.

SPECIAL SOUVENIR LAUNCH

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eGov, India's first and Asia & Middle East's premier magazine on e-Governance and innovations, is published by Elets Technomedia Pvt Ltd., which is set to bring a Special Souvenir to showcase investment opportunities and potential in various sectors of Uttar Pradesh.

It will be launched at Uttar Pradesh Investors Summit 2018 on 21 - 22 February in Lucknow

Special Souvenir to touch upon issues like:

- What is Uttar Pradesh Investors Summit 2018?
- Why should one invest in Uttar Pradesh?
- What are the focus sectors of Uttar Pradesh?
- What are the incentives available to entrepreneurs?
- How the policies are helpful to entrepreneurs?
- How does the State Government facilitate land acquisition?
- How does one set up an industry in Uttar Pradesh?
- What kind of facilitation is offered to Non-resident Uttar Pradesh Vasi?
- Which is the nodal agency for Single Window Facilitation?

Special Souvenir to feature:

Policymakers and Industry captains from following sectors:

- AGRO AND FOOD PROCESSING
- DAIRY
- TEXTILE
- TOURISM
- MSME
- FILM
- ELECTRONICS MANUFACTURING
- IT/ITeS
- RENEWABLE ENERGY
- CIVIL AVIATION

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AMIT SHARMA
Regional Director, Survey & Land Records, Government of Jammu and Kashmir

"I believe, anything done with passion—in the country, any State, any Municipal Corporations—will convey results. The basic fundamental would be to reduce the waste; recycling the waste, reuse of the waste, and recovery of the waste—to produce a sustainable energy out of waste."

B KALYAN CHAKRAVARTHY
Director General, Environment Protection Training and Research Institute (EPTRI), Hyderabad

"EPTRI has made mandatory for all the commercial complexes that it cannot discharge waste but recycle, implementing bio-digesters that will help in the conservation of environment in the long run."

SAURAV AGRAWAL
Advisor – Clean India Mission (Swachh Bharat), European Business and Technology Centre (EBTC)

"We have made a cluster model to promote technologies, solutions, research case studies of academic institutions—put up on our website. For instance, if Hyderabad is looking for a problem to a solution, on the basis of the problem identified, we channelise and facilitate an appropriate solution, case studies and initiate dialogue between authorities."

HEMANTH KUMAR
Head-Business Development, Automotive Environmental Solutions

"We have tie-ups with as many national and international companies that specialises on waste management. We work in collaboration with them by bringing in our networking and solution to facilitate the service."

G N Murthy
General Manager
ITC Ltd

"We have identified a lot of sustainable model that brings solution on the waste management with an objective to establish better environment, better hygiene and reduce landfills."

PPP MODELS IN LOCAL GOVERNMENT DEVELOPMENT AND CSR IN WASTE MANAGEMENT

Discussion on Public Private Partnerships projects

RAVNEET CHEEMA
Commissioner, Dehradun Municipal Corporation, Government of Uttarakhand

"PPP model can be helpful in terms of revenue generation, decreasing the burden on the Government and urban local bodies, but everything should be put in papers before carrying out any PPP projects."

K N HEMANTH KUMAR
Manager, Energy Efficiency Services Ltd (EESL)

"We are an agency tasked with implementing energy efficient projects across India. In partnership with the GHMC, we've launched Ujala Scheme, an MoU was signed to carry-out LED programme through self-help groups. We are putting-up/ replacing around 8 lakh street lights in the city of Telangana which is probably one of the most number of street lights put up globally."

HARI CHANDANA DASARI
Commissioner, Central Zone, GHMC, Government of Telangana

"The biggest takeaway from the National Waste Management Summit for all of us is the lesson that anything can be achieved through collaborative effort and trust along with sharing ideas and experiences in order to succeed in any holistic approach."

WEALTH OUT OF WASTE : REDEFINING WASTE MANAGEMENT SCENARIO

Session on waste-to-energy

DR D K BEHERA
Senior Environment Scientist,
Odisha State Pollution Control
Board, Government of Odisha

"If looked at the waste management scenario in the country, barring few Smart Cities where things are progressing really well, many urban bodies are not undertaking the initiative. There's a situation: the urban bodies complain about the lack of adequate funds."

CHALLA KODANDARAM
Hon'ble Justice, High Court of Judicature,
Telangana & Andhra Pradesh

"The Government, instead of spending resource on advertisements, should focus on uplifting innovations that actually introduces solutions to the problems of waste management."

Glimpses of the Expo

awards

Felicitation of the participants for their outstanding contribution in the field of Waste Management.

Host Partner

GHMC
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Associate Partners	Exhibitors
Hyderabad Metropolitan Water Supply & Sewerage Board; TSIIC Telangana State Industrial Infrastructure Corporation Ltd. (A GOVT. OF TELANGANA STATE UNDERTAKING); Telangana State Pollution Control Board	BitRaser Certified Data Erasure; IIT; IndianOil

Exhibitors	Supporting Partners
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