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Haryana's Sustainable Energy Transition

6th elets National Energy Summit

29th FEBRUARY 2024 | CHANDIGARH

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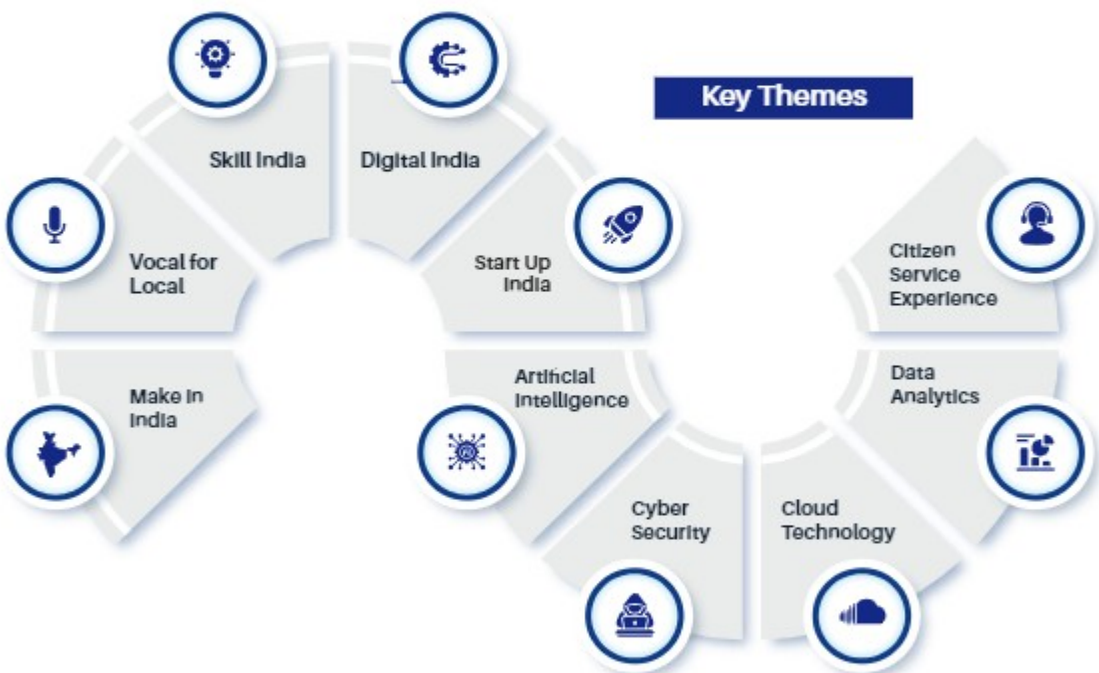

Key Participants

- Niti Aayog
- PSU Leaders
- IT Heads of Government/PSU
- CISOs of PSU & Central Government Departments
- Ministries and Departments of Central Government
- Ministries and Departments of State Governments

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Shri Manohar Lal
Hon'ble Chief Minister, Haryana

Haryana is a vivid kaleidoscope of diverse landscapes showcasing magnificent archaeology and celebrating art and culture. State has preserved the best of both worlds – the footprints of the bygone era and futuristic vision in its development saga. Haryana has taken several effective initiatives to strengthen and modernize energy infrastructure.

The International Paris Climate agreement followed by Conference of Parties (COP) commitment and G20 summit at New Delhi will inevitably lead to a series of new public policies and regulations around the world. All major industries may require revisiting their business model and practices to adapt to this new reality. In Glasgow, Government of India has committed to reach net-zero (emissions) by 2070.

The transition towards renewable energy and energy conservation is even more important for Haryana. The existing Renewable Energy framework of the State is being revised to align with latest regulations and India's ambitious Renewable Energy capacity extension programme. Haryana Government is also promoting energy efficiency as a measure for energy transition. Haryana is one of the top performing States at the national level in the large States category for effective implementation of energy conservation policies.

I congratulate New and Renewable Energy Department, Haryana & HAREDA and Elets Technomedia for organising the 6th Elets National Energy Summit in Chandigarh. I am confident that this summit will lead to fruitful discussions and pave the way for the growth and development of the renewable energy sector in Haryana.

Let us join forces to chalk out a fresh & comprehensive approach to address various challenges and fuel a next wave of innovation in the energy sector.

My best wishes!

(Manohar Lal)

RANJIT SINGH
रणजीत सिंह

D. O. No. 1/2024

Energy and Jails Minister, Haryana,
Chandigarh.
ऊर्जा और जेल मन्त्री, हरियाणा,
चण्डीगढ़।

Dated, Chandigarh... 26-02-2024

Message

Development and environment are the two key balancing factors for sustainability. For economic development, energy is the prime mover. But, at the same time it has accounted for more than 80% of GHG emissions causing climate change. Climate change is the main concern for future of the mankind and, therefore, energy sector which is predominantly dominated by fossil fuels demands most attention.

In the recent Conference of Parties (COP -26) at Glasgow, UK, India has reiterated its commitment for reduction in emission intensity by 2030 from earlier target 33-35% to 45% from 2005 levels. In the recently concluded G20 Summit at New Delhi, it has been agreed upon to accelerate transition towards low- emission energy systems, including scaling up the deployment of clean power generation including renewable energy, as well as energy efficiency measures. The Summit has also endorsed the 'Voluntary Action Plan on Doubling the Rate of Energy Efficiency Improvement by 2030' as indicated in the Sustainable Development Goals.

Haryana is implementing "Renewable Energy and Energy Efficiency expansion programs" and moving towards the achievement of our target to fulfill our commitments made in various Global platforms. Haryana is way ahead in achieving RPO commitments and has been able to achieve 29.5% RPO against target of 24.51%. Haryana is among top performing states in the Country in implementing PradhanMantriKisanUrjaSurkshaEvamUtthanMahabhiyan (PM-KUSUM) with installation of more than 70,000 solar water pumping systems. Transport, Industry, Building and Agriculture have been identified as the major sectors having potential for energy efficiency and energy transition. An action plan has been prepared for reducing carbon footprint of the State in these sectors.

I extend my warmest congratulations to the New and Renewable Energy Department, Haryana & HAREDA and EletsTechnomedia for organising the 6th Elets National Energy Summit in Haryana.

In light of India's journey to clean energy transition, summits like this catalyze the movement further. I also congratulate eGov magazine for documenting a special issue to capture the incredible transformation in Haryana's energy landscape.

Ranjit Singh

(Ranjit Singh)

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(A.K. Singh, IAS)
Additional Chief Secretary
Energy Department
Haryana

MESSAGE

The Government of India has initiated a comprehensive programme to significantly enhance availability of energy at an affordable price to meet the growing needs of the economy. While capacity addition has been a major focus and energy efficiency along with renewable energy are the thrust areas to ensure sustainable development.

To attain India's ambitions energy transition Journey with a fifty percent cumulative electric power installed capacity from non fossil fuel based energy resources by 2030 and achieving net zero by 2070, it is imperative that domestically available renewable energy alternatives are optimally utilized. Solar, bio-energy, and hydropower, among others, offer not only environmentally friendly alternatives but also open avenues for innovation and economic growth. Equally important is our commitment to energy conservation. Energy-efficient practices not only benefit the environment but also lead to cost savings and overall improved efficiency. The enactment of the Energy Conservation Act 2001 has led to the implementation of various Energy Efficiency and Demand Side Management programmes in different sectors of the economy.

I am pleased to share that Haryana has been making remarkable strides in promoting renewable energy and energy conservation in the state, which is helping to reduce the State's dependence on fossil fuels, mitigate climate change, and create employment opportunities in the clean energy sector. The total installed capacity of power in Haryana State is 13,223.46 MW. The share of power from Renewable Energy in the State is about 29.5 % of the installed capacity. To meet the irrigation requirements of farmers in the State, and to reduce the input cost of harvesting by replacing existing diesel pump sets, Haryana Govt. is implementing a scheme to install solar pumps of 3 HP to 10 HP capacity in the State with a total 75% subsidy, including 45% from the State, under the *Pradhan Mantri Kisan Urja Surksha Evam Utthan Mahabhiyan* (PM-KUSUM) and I am glad to state that Haryana is the top performing State in the Country. Haryana has recently notified green open access regulations, which will pave the way for further adoption of Renewable Energy in the State in a big way.

I extend my warmest greetings & best wishes to the New and Renewable Energy Department, Haryana/HAREDA for organising the 6th Elets National Energy Summit in Haryana. Let us foster a culture of awareness, responsibility and positive change by embracing good & sustainable practices for a greener future for the generations to come.

(A.K. Singh, IAS)

S. Narayanan, IFS
Director General, New and Renewable Energy
Department, Haryana & HAREDA

In our collective pursuit of a greener and cleaner environment, renewable energy sources play a pivotal role. Harnessing the power of the sun, wind, water, and other renewable resources not only mitigates the impact of climate change but also fosters energy security and economic resilience in a sustainable way.

Haryana Government is committed to public welfare and encourages everyone to actively participate in and support renewable energy and energy conservation initiatives. Government at various levels is implementing policies and projects to promote the adoption of renewable energy technologies. From solar power installations to Bio mass projects, these initiatives not only reduce our carbon footprint but also create employment opportunities and stimulate economic growth. Transport, Industry, Building and Agriculture have been identified as the major sectors having potential for energy efficiency and energy transition. An action plan has been prepared for reducing carbon footprint of the State in these sectors.

The New and Renewable Energy Department, Haryana / HAREDA is proactively working towards awareness, skill development and quality assurance and for promotion of Renewable Energy and Energy Conservation. The Department is implementing programmes for commercial as well as social sector The Department is facilitating Biogas, CBG, Biomass and Solar projects. The Department is promoting paddy straw based biomass projects not only to combat environment issues but also to generate green power.

As we navigate the challenges posed by climate change, the demand for sustainable and environmentally friendly energy solutions has never been higher. I believe that investing in renewable energy and energy conservation projects can contribute not only to the well-being of our environment but also to the prosperity of our communities. I invite industries and other investors who share our vision for a sustainable future for their strategic investment in the State.

I congratulate Elets Technomedia for organising the 6th Elets National Energy Summit in Haryana in close association with New & Renewable Energy Department, Haryana / HAREDA. Together, we can usher in a new era of responsible energy consumption and environmental stewardship. Let us work hand in hand to create a future where clean and renewable energy powers our progress, and our commitment to energy conservation becomes ingrained in our daily lives.

S. Narayan

(S. Narayanan, IFS)

(DR. SAKET KUMAR, IAS)
MANAGING DIRECTOR
UTTAR HARYANA BIJLI VITRAN NIGAM
GOVERNMENT OF HARYANA

MESSAGE

Achieving India's net-zero pledge by 2070 requires a collaborative action amongst all stakeholders. Haryana, with it's burgeoning clean energy sector, exemplifies regional leadership in this global mission. The state's renewable energy vision puts us on the right track to achieve this goal.

I congratulate the Haryana Renewable Energy Development Agency (HAREDA) and Elets Technomedia for hosting the 6th Elets National Energy Summit in Haryana. Events like these play a pivotal role in driving sustainable progress.

As global discussions increasingly prioritize environmental stewardship, it is heartening to see the state of Haryana taking proactive steps to embrace renewable solutions. I also commend e-Gov magazine's special issue documenting Haryana's renewable journey. Our efforts, alongside key stakeholders, will be pivotal in realizing a sustainable, climate-resilient future.

Let this summit strengthen our dedication to policy innovation, local empowerment and partnership-driven progress. I wish HAREDA, Elets and all participants the very best in this important endeavour.

Saket

(Dr. Saket Kumar, IAS)

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Paving the Way for a Sustainable Energy Future

As the impacts of climate change become increasingly undeniable, the transition to renewable sources has become an urgent global priority. India has committed to achieving 175 GW of renewable capacity by 2022 as part of its climate action goals. States like Haryana play a vital role in making this vision a reality through ambitious clean energy policies and partnerships.

Haryana has been fervently advocating for renewable energy, particularly solar power, to fulfill its energy requirements and diminish its environmental impact. The state proudly hosts a combined installed and contracted capacity of around 14,026 MW, of which renewable sources account for approximately 2,157 MW, making up 15.4% of its energy portfolio. Remarkably, Haryana showcases one of India's highest per capita energy consumption rates, reaching 2,167 units annually, underscoring its advanced developmental status.

To catalyze India's energy transition, the 6th Elets National Energy Summit convenes key stakeholders dedicated to propelling the nation towards green and sustainable development. Organized by the Haryana Renewable Energy Development Agency in partnership with Elets Technomedia, this summit outlines Haryana's renewable energy trajectory for the upcoming decade. Topics such as solar rooftop programs, wind power development, energy efficiency mechanisms, and green financing models will be discussed extensively.

By providing a platform for dialogue between industry, government, researchers, and investors, the summit aims to revolutionize Haryana's clean energy journey. New policy ideas and groundbreaking projects with the potential to transform the state's energy landscape will be unveiled. Success stories from both national and international leaders will illuminate best practices.

In this special issue of eGov magazine, we explore Haryana's ambitious renewable targets and the innovative strategies being adopted to achieve them. We also examine India's national progress in meeting its climate commitments. These discussions and insights empower all stakeholders to continue driving the low-carbon transition with disciplined policymaking and collaborative action.

Together, we can pave the way towards a brighter, greener, more sustainable energy future.

DR. RAVI GUPTA
Editor-in-Chief, eGov magazine, and
Founder, Publisher & CEO,
Elets Technomedia Pvt Ltd

https://egov.eletsonline.com/editorial/

SUSTAINABLE SPARKS
ILLUMINATING HARYANA'S ENERGY LANDSCAPE

Haryana prioritises adopting sustainable clean energy initiatives and harnessing renewable sources like solar, hydrogen, and Compressed Biogas (CBG). The state is committed to achieving net zero carbon emissions, promoting environment-friendly practices, and ensuring a greener future. With innovative technologies and strategic planning, Haryana aims to achieve long-term environmental sustainability while meeting its energy needs. With this inclusive approach to serving growth while operating sustainably, Haryana can curate a roadmap for other states to follow, writes **Kapil Suri** of **Elets News Network (ENN).**

Haryana's sustainable transformation of its Energy sector signifies a pivotal shift towards cleaner and more efficient energy practices within the state. Haryana Renewable Energy Development Agency (HAREDA) focuses on achieving the national mission of increasing energy efficiency using the Perform, Achieve & Trade (PAT) mechanism. This mission aims to leverage a market-based approach to realise energy efficiency opportunities, projected at approximately Rs. 74,000 crores, with expected annual fuel savings surpassing 23 million and a cumulative avoidance of 19,000 MW in electricity capacity addition. The PAT cycle-7 that occurred in 2021 will be assessed in 2024-25 for its efficacy. In this way, Haryana has embarked on a journey of innovation and adaptation in its energy sector. The state is reshaping its energy landscape through strategic investments in renewable energy sources such as solar and wind power and initiatives to enhance energy efficiency across industries and infrastructure. By embracing advanced technologies and fostering collaboration between government, private sectors, and local communities, Haryana is paving the way for a greener future, driving economic growth, and creating new opportunities for its residents. This transformation underscores Haryana's commitment to sustainable development and is a beacon of inspiration for regions worldwide seeking to navigate the transition towards a more sustainable energy future.

SOLAR ENERGY, CBG & BIOMASS POWER

Haryana, the land of diverse landscapes and burgeoning urban centres is embarking on a remarkable journey toward a sustainable future powered by clean energy. With an ardent focus on reducing carbon emissions and fostering environmental stewardship, the state

is pioneering innovative initiatives that promise to reshape its energy landscape. From harnessing solar power to promoting wind energy, Haryana's commitment to sustainability inspires the nation and the world.

HARNESSING SOLAR POWER

At the forefront of Haryana's clean energy revolution is its extensive utilisation of solar power. The state boasts abundant sunlight throughout the year, making it an ideal location for solar energy generation. Haryana's Solar Policy draft 2023 has established an ambitious goal of installing 6 GW of solar capacity. This plan encompasses 1.6 GW of rooftop solar power plants, 3.2 GW of ground-mounted solar power plants, and the conversion of irrigation pumps to solar power with a capacity of 1.2 GW. Through these ambitious solar projects and rooftop solar installations, Haryana will tap into its natural resources to meet its energy needs sustainably. With initiatives like the Saur Urja Bhawan (Solar Energy Building) and incentivised schemes for solar adoption in residential and commercial sectors, the state is swiftly transitioning towards a solar-powered future.

PROMOTING WIND ENERGY

In addition to solar power, Haryana is harnessing wind power to bolster its renewable energy portfolio. To encourage electricity generation from renewable sources, the Haryana Government has given preliminary approval to establish three Wind Power Projects with a total capacity of 340 MW. These projects will be located within the Aravalli Hill Ranges, spanning across Mahendragarh, Gurgaon, and Mewat districts 160 MW. The state's vast plains and strategic location make it conducive to wind energy generation. Haryana is capitalising on this abundant renewable resource through partnerships with private enterprises and establishing wind farms. By integrating wind energy into its grid infrastructure, the state diversifies its energy mix and reduces reliance on conventional fossil fuels.

EMPOWERING RURAL COMMUNITIES

Crucial to Haryana's sustainable energy vision is empowering its rural communities. Initiatives like the Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) aim to electrify rural households using renewable energy

sources, enhance energy access, and foster socio-economic development. By deploying decentralised renewable energy systems in remote villages, Haryana provides electricity to underserved areas and creates opportunities for livelihood enhancement and poverty alleviation.

GOVERNMENT COMMITMENT AND POLICY SUPPORT

Central to Haryana's clean energy initiatives is the unwavering commitment of its government to sustainability. The state enables clean energy adoption through progressive policies, programmes, and financial incentives.

The program's initial phase has received approval with a budget allocation of Rs. 858 crore. On November 2, 2022, the Ministry of New and Renewable Energy (MNRE), Government of India, officially announced the National Bioenergy Programme. MNRE has extended the National Bioenergy Programme for the period spanning from financial year 2021-22 to 2025-26. Moreover, net metering, renewable purchase obligations, and renewable energy certificates incentivise private investment in clean energy projects and drive the transition towards a low-carbon economy.

EVOLVING ENERGY SECTOR CHALLENGES AND OPPORTUNITIES

The energy sector in Haryana is currently undergoing a transformative phase marked by challenges and opportunities. With a rising population and rapid industrialisation, the state faces the pressing challenge of meeting growing energy demand while ensuring sustainability and reliability. Infrastructure development to support this demand is imperative, necessitating substantial investments in power generation, transmission, and distribution networks. Environmental concerns loom large, particularly regarding pollution from conventional energy sources like thermal power plants and vehicular emissions. However, amidst these challenges lie significant opportunities. Haryana possesses immense potential for renewable energy, particularly solar and wind power, which can help mitigate environmental impact and reduce reliance on fossil fuels. Embracing energy efficiency measures, technological innovation, and supportive policies can enhance the sector's resilience and sustainability. Skill development initiatives and public awareness campaigns will also be pivotal in driving the transition towards a cleaner and more resilient energy future in Haryana.

SMART METERS

Haryana's journey with smart meters marks a significant leap towards modernising its energy infrastructure. Energy Efficient Services Limited (EESL), the company tasked with replacing old meters with smart meters by the two distribution companies, has also drawn criticism. According to reports, the Haryana power department had set a target for installing 3 million meters by December 2024. This deployment of smart meters across the state has brought efficiency to electricity distribution and empowered consumers with real-time data and control over their usage. This technological advancement has been pivotal in curbing losses, enhancing billing accuracy, and promoting energy conservation. Looking ahead, the outlook for Haryana's smart meters appears promising, with anticipated expansions in coverage and functionalities. Integrating advanced analytics and Internet of Things (IoT) capabilities could further optimise energy management, reduce peak demand, and facilitate the integration of renewable energy sources. Moreover, fostering a robust ecosystem for innovation and

collaboration can unlock new possibilities, such as demand response programs and grid optimisation strategies, ultimately boosting Haryana's more sustainable and resilient energy landscape.

ENERGY EFFICIENCY & SECURITY

Haryana Energy Efficiency & Security is a comprehensive initiative to improve energy efficiency and security measures in Haryana, India. The program focuses on implementing various strategies and technologies to reduce energy consumption, promote renewable energy sources, and enhance the overall energy infrastructure. By adopting energy-efficient practices in industries, commercial buildings, and residential areas, the initiative aims to reduce greenhouse gas emissions and mitigate the impact of climate change. Additionally, efforts are made to strengthen the security of energy supply chains, ensuring uninterrupted access to electricity and fuel for the residents of Haryana. Through partnerships with government agencies, private sector companies, and local communities, Haryana Energy Efficiency & Security strives to create a sustainable and resilient energy ecosystem for the state.

CLEAN TECHNOLOGIES

The state has been making significant strides in adopting clean technologies to address environmental concerns and promote sustainable development. With a growing emphasis on renewable energy sources, such as solar and wind power, Haryana has been investing in infrastructure and policies to encourage the adoption of these technologies. The state government has implemented initiatives to promote energy efficiency in industries, encourage the use of electric vehicles, and improve waste management practices. Additionally,

Haryana has actively participated in national and international efforts to combat climate change, demonstrating its commitment to creating a cleaner and greener future for its residents. Through innovation and collaboration, the state's clean technologies pave the way for a more sustainable and environmentally friendly future.

HYDROGEN ECONOMY

Haryana's hydrogen economy continues progressing towards its sustainability and energy independence goals. The state government has been actively promoting hydrogen as a clean energy source and has initiated several projects to encourage its adoption across various sectors. This includes setting up hydrogen refuelling stations, supporting research and development in hydrogen production technologies, and partnering with industry stakeholders to develop hydrogen-powered transportation and industrial applications. Additionally, On February 15, 2024, the Haryana government released the preliminary version of the Haryana Green Hydrogen Policy 2024. This policy aims to expedite the advancement and acceptance of green hydrogen and its byproducts as alternative fuel and raw material sources in alignment with the National Green Hydrogen Mission. This initiative seeks to leverage the clean energy potential to bolster energy security, optimise renewable energy resources, and utilise biomass effectively to substitute fossil fuel consumption within the state.

NET-ZERO EMISSION ROADMAP

As of the latest updates, Haryana's Net-Zero Emission Roadmap continues progressing, focusing on implementing best practices while addressing ongoing challenges and seizing opportunities. The most crucial target is enhancing renewable energy capacity to 9,000 MW by 2030. The government has actively engaged with stakeholders from various sectors to develop strategies for reducing greenhouse gas emissions and transitioning to renewable energy sources. However, funding constraints, technological barriers, and resistance from specific industries remain significant. Nevertheless, optimism surrounds the potential economic and environmental benefits of achieving net-zero emissions, including job creation, improved public health, and

enhanced resilience to climate change impacts. Ongoing efforts include investment in clean energy infrastructure, policy reforms to incentivise low-carbon practices, and public awareness campaigns to promote sustainable lifestyles.

ELECTRIC VEHICLE AND CHARGING INFRASTRUCTURE

With its burgeoning interest in sustainable development, Haryana is making significant strides in Electric Vehicles (EVs) and charging infrastructure. The state's commitment to reducing carbon emissions and fostering clean transportation is evident in its robust initiatives.

Sufficient Charging Infrastructure is necessary to drive the widespread adoption of electric vehicles throughout India. In light of this, the Ministry of Power has released "Charging Infrastructure for Electric Vehicles: Guidelines and Standards," outlining the duties and obligations of stakeholders at both the Central and State levels. These guidelines aim to accelerate the establishment of public EV charging infrastructure nationwide. Haryana is actively promoting the adoption of electric vehicles through various incentives, including subsidies and tax breaks. Moreover, the government is rapidly expanding the charging infrastructure across vital urban centres and highways, ensuring convenient access for EV users. This proactive approach reduces air pollution and positions Haryana as a frontrunner in transitioning towards a greener and more sustainable future.

WAY FORWARD

Haryana can implement clean energy in several ways to ensure a sustainable future. Firstly, investing in renewable energy sources such as solar and wind power can be prioritised. The state can incentivise the installation of solar panels on rooftops of residential and commercial buildings, as well as large-scale solar farms in suitable areas. Additionally, promoting wind energy projects, especially in regions with high wind potential, can diversify the clean energy portfolio further. Secondly, encouraging energy efficiency measures across industries, buildings, and transportation sectors can significantly reduce energy consumption and carbon emissions. Implementing policies to enforce energy-efficient practices and technologies can yield long-term benefits. Thirdly, fostering research and development in clean energy technologies can spur innovation and drive down costs, making clean energy more accessible and affordable for all. Lastly, strengthening partnerships with private sectors, academia, and other stakeholders can facilitate developing and deploying clean energy solutions, ensuring Haryana's transition to a cleaner and more sustainable energy future.

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» SHRI S. NARAYANAN
Director General - Haryana Renewable Energy Development Agency (HAREDA)

Haryana's Significant Renewable Strides

From promoting renewable energy adoption across the state to tackling pressing issues such as stubble burning and fostering energy conservation, Haryana is spearheading concrete initiatives on all fronts. **Shri S. Narayanan**, Director General - Haryana Renewable Energy Development Agency (HAREDA), shared these insights in an exclusive interview with **Priya Yadav**, Associate Editor at **Elets News Network (ENN).** *Edited excerpts:*

How has Haryana been promoting renewable energy, particularly solar energy, and what initiatives has the government undertaken in this regard?

Haryana has been actively promoting renewable energy, focusing on solar energy, to meet its energy needs and reduce its carbon footprint. The state boasts a total installed and contracted capacity of approximately 14,026 MW, with renewable sources contributing about 2,157 MW, constituting 15.4% of its energy mix. Notably, Haryana exhibits one of India's highest per capita energy consumption rates, standing at 2,167 units annually, a marker of its developed status.

Capitalizing on its agricultural landscape, Haryana recognizes the potential of solar energy and biomass. The state's Solar Policy 2016 emphasizes deploying megawatt-scale and rooftop solar systems alongside off-grid solar applications. Haryana has an installed solar capacity of 1,323.61 MW, comprising 265.80 MW from ground-mounted

solar, 486.23 MW from rooftop solar, and 572 MW from off-grid solar installations.

The state government has launched initiatives like the Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PMKUSUM) scheme to bolster solar energy adoption in the agricultural sector. This scheme offers 75% subsidies, including 30% from the Government of India, for solar pumps ranging from 3 H.P. to 10 H.P. Over the past three years, around 80,000 solar pumps have been installed in Haryana under this scheme, totaling approximately 546 MW of installed solar capacity. Haryana is the top-performing state in this national program, showcasing its commitment to renewable energy adoption and sustainability.

Additionally, Haryana has tapped into its hydroelectric potential by establishing projects with a capacity of 73.2 MW on the Yamuna barrage and its associated canal. Moreover, aligning with national environmental objectives, the government is committed to the Panchamrut Goals outlined by the Prime Minister at the Glasgow Conference, actively promoting renewable energy initiatives. Notably, Haryana Power Utilities have met their Renewable Purchase Obligations (RPO) for 2022-23 and have secured tie-ups to fulfill the targeted RPO of 43.33% by 2029-30, demonstrating proactive measures towards sustainable energy practices.

What initiatives has the State Government of Haryana taken to address agricultural waste?

The State Government of Haryana has initiated several measures to address agricultural waste. Firstly, it has decided to procure 800 MW Round the Clock (RTC) renewable energy power through tendering by Solar Energy Corporation of India (SECI) at a ceiling tariff of Rs. 4.60 per unit, with 1200 MW solar projects to be installed in Haryana. Secondly, Indian Oil Corporation Limited (IOCL) has installed a 100 KLPD capacity paddy straw-based 2G ethanol plant in Baholi, Panipat. Thirdly, Oil Marketing Companies have issued Letters of Intent (LoIs) to 165 firms for setting up Compressed Biogas (CBG) projects of 1268 TPD capacity in Haryana under the SATAT scheme, with 6 projects commissioned and 6 under execution. Additionally, the State Government has fixed Common Determined Rates for procurement of paddy crop residue and is offering Panchayat Land for biomass and solar projects at favorable lease rates.

How does the State Government of Haryana address the issue of stubble burning in the region?

The State Government of Haryana has taken multifaceted approaches to tackle stubble burning and promote renewable energy within the region. Firstly, acknowledging the substantial biomass generated annually, particularly from farm operations like paddy straw, the government introduced the Haryana Bio-energy Policy 2018. This policy aims to leverage biomass as an energy source, providing an additional income stream for farmers while creating rural employment opportunities. To address the issue of stubble burning directly, the government has approved and implemented stubble-based biomass projects across various districts, totaling 49.8 MW capacity, with operational projects in Kaithal,

Year	Wind Renewable Energy	Hydro Renewable Energy	Distributed Renewble Energy*	Other Renewable Enrgy	Tota Renewable Energy
2024-25	0.67%	0.38%	1.50%	27.35%	29.91%
2025-26	1.45%	1.22%	2.10%	28.24%	33.01%
2026-27	1.97%	1.34%	2.70%	29.94%	35.95%
2027-28	2.45%	1.42%	3.30%	31.64%	38.81%
2028-29	2.95%	1.42%	3.90%	33.10%	41.36%
2029-30	3.48%	1.33%	4.50%	34.02%	43.33%

Source: Ministry of Power — Solarquarter Research

Kurukshetra, and plans in the final stages for projects in Fatehabad and Jind.

What initiatives has the Haryana State Government undertaken to promote energy conservation and the adoption of electric vehicles?

The Haryana State Government has implemented multifaceted strategies to enhance energy conservation and facilitate the transition to electric vehicles (EVs). Recognized for its proactive approach, Haryana secured the Second Best State award in the large States category during the National Energy Conservation Day 2023, commended by the Hon'ble President of India. Demonstrating commitment, Haryana ranks high in the State Energy Efficiency Index and strives for net zero through various energy efficiency initiatives spanning buildings, industries, transport, urban local bodies, and the energy sector.

The government encourages solar system installations in public buildings, solar street lights in rural areas, and solar home lighting systems for marginalized communities to promote renewable energy. Furthermore, the State's Electric Vehicle Policy 2022 incentivizes the adoption of EVs, offering financial support ranging from manufacturing to purchasing stages. With over 375 operational public EV charging stations, Haryana has created infrastructure conducive to electric vehicle usage, contributing significantly to environmental sustainability and energy conservation efforts.

Firstly, Haryana has undertaken an "Opportunity assessment" and is formulating a State Green Hydrogen Policy, indicating a strategic intent to leverage renewable energy sources for hydrogen production. Establishing two hydrogen refueling stations and installing a 7-kilo per day green hydrogen plant at Jindal Steel are tangible steps towards infrastructure development.

What are the key initiatives taken by the Haryana government to promote green hydrogen, and how do they contribute to India's larger sustainable development goal?

The Haryana government has embarked on several crucial initiatives to bolster the adoption of green hydrogen within the state, aligning with India's broader vision of sustainable development. These initiatives reflect a proactive approach towards reducing carbon emissions and fostering self-reliant economic pathways.

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Moreover, the proposed hydrogen fuel-based train prototype on the Jind-Sonepat route by the Indian Railways underscores a commitment to sustainable transport solutions. This innovation reduces carbon impact and positions India as a pioneer in green transportation.

Furthermore, collaborations with industry players like Maruti Suzuki India Ltd to facilitate green hydrogen plants within their manufacturing units highlight public-private partnerships driving environmental sustainability. These concerted efforts signify Haryana's proactive role in fostering a green energy ecosystem while contributing to India's national agenda of transitioning towards renewable energy and reducing carbon emissions.

Lighting Lives 24x7 "Mhara Gaon Jagmag Gaon"

The Hon'ble Chief Minister of Haryana launched the 'Mhara Gaon Jagmag Gaon' (MGJG) Scheme on 1st July 2015 to provide an uninterrupted 24X7 power supply to all the rural households in the state. The scheme envisioned increasing the supply hours in a graded manner linked to the reduction in AT&C losses and recovery of past dues. Under the MGJG scheme, the complete power infrastructure of villages has been revamped to reduce losses and to ensure 24-hour supply. The Salient features of the Scheme are as follows:

- Replacement of bare conductor with armored XLPE cable
- Replacement of defective/ electromechanical meters (with downloadable Electronic meters)
- Shifting of meters outside the premises on poles

On implementing the above measures and reducing losses, the supply hours are increased to 24 hours at par with urban areas of the state. Of 7256 villages in the state, 5805 villages (80%) have been brought on a 24-hour supply schedule. The year-wise progress is given as under:

ENDING JAN	VILLAGES
31-Jan-16	105
31-Jan-17	405
31-Jan-18	1722
31-Jan-19	2707
31-Jan-20	4258
31-Jan-21	5223
31-Jan-22	5569
31-Jan-23	5694
31-Jan-24	5814

- Maintenance of DTs, Maintenance of LD system

Therefore, the scheme has met with tremendous success and changes and has significantly improved the ease of living standards of rural Haryana, wherein now, with the availability of 24-hour supply, there have been greater economic and business activities in villages.

The utility-wise progress is given as under:

UTILITY	VILLAGES	JAGMAG VILLAGES
UHBVN	3590	3341
DHBVN	3666	2473
Total	7256	5814

In 10 districts of Panchkula, Ambala, Yamuna Nagar, Kurukshetra, Faridabad, Gurugram, Rewari, and Sirsa, all rural feeders are running on 24 hours.

As an impact of the scheme, there has been a substantial increase in hours of power supply in rural areas given as under:

UTILITY	FY 16-17	FY 22-23
UHBVN	12 hours 40 minutes	21 hours 9 minutes
DHBVN	13 hours 3 minutes	20 hours 42 minutes

The losses have reduced substantially over the years as under

UTILITY	FY 2016-17	FY 2023-24 (UP TO NOV.-23)
UHBVN	76.48 %	22.69 %
DHBVN	58.39 %	37.04 %

Haryana Strides Towards Sustainable Energy Future

By transitioning to clean energy technologies that yield sustainable growth, the government of Haryana is using renewable energy sources to achieve a competitive advantage embedded with sustainable development. Incorporation of these initiatives will help to reduce climate issues and carbon emissions, among other environmental problems, shared **Dr Saket Kumar**, Managing Director, Uttar Haryana Bijli Vitran Nigam (UHBVN), in an exclusive interview with **Priya Yadav** of **Elets News Network (ENN)**. Edited Excerpts:

» **DR SAKET KUMAR**
Managing Director
Uttar Haryana Bijli Vitran Nigam (UHBVN)

As the Managing Director of Uttar Haryana Bijli Vitran Nigam, please elucidate the key challenges presently faced in strengthening the electricity distribution infrastructure and enhancing service quality standards across the state. Also, could you highlight the strategic initiatives and reforms to address these challenges effectively?

Strengthening electrical distribution infrastructure poses several challenges. Timely replacement and upgradation of ageing electrical distribution infrastructure; meeting the infrastructure demand posed by rapid urbanisation and population growth; ensuring round-the-clock quality and reliable power supply to the consumer; implementation of an effective mechanism for consumer grievance redressal; checking theft of electricity and correcting the deficiencies in billing and collection efficiencies are critical areas of concern.

Haryana's flagship scheme, Mhara Gaon Jagmag Gaon (MGJG) Scheme, was a significant initiative in this area. With high distribution losses, the rural domestic sector has historically presented the most critical obstacle to distribution efficiency. In the state's rural domestic category, overall distribution losses exceeded 70%, and billing efficiency was below 30%.

Under the MGJG scheme, the Haryana government has invested heavily in upgrading the power infrastructure in rural areas. The scheme involved a complete overhaul and replacement of the LV Distribution system, meters, etc. Further, Consumers under the MGJG scheme have also been facilitated with Surcharge waiver and payments in installation.

All this resulted in a substantial increase in average running supply hours on RDS feeders. In FY 2022-23, the average running hours of UHBVN were 21 hours 9 minutes, which was 12 hours 40 minutes in FY 2016-17. Our AT&C losses for the corresponding period have also reduced from 30.75% to 10.32%.

Could you discuss the targeted programs and modernisation efforts focusing on grid automation, smart metering, infrastructure upgrades, etc., to augment technical and commercial capacities?

UHBVN has always been the frontrunner power distribution utility for technology adoption and deployment. Grid automation, smart metering, and associated IT solutions are emerging technologies in the power distribution business field. For Smart Metering implementation, UHBVN has already replaced 5 Lakh conventional meters with smart meters and is targeting to return the balance of 27 lakh consumer meters with Smart Meters, which have prepaid billing options with end-to-end Feeder & DT level energy auditing. It is planned to replace the balance by December 2026.

With a focus on grid automation, adopting the Supervisory Control & Data Acquisition (SCADA) system will help provide reliable and quality power to the consumers; UHBVN has successfully executed the SCADA project in the industrial estate Kundli. In the area, SCADA helps in accurate time monitoring & control of 22 industrial 11kv feeders through 3 no: RTUs, 96 RMUs and 44 km optical fibre cable network. The system has increased the reliability of supply & operational efficiency by serving load through multi-fed systems.

Further, UHBVN is targeting to implement SCADA automation with DMS (Distribution Management System) in UHBVN in the next two years under the RDSS scheme of Govt. of India in 6 Major towns (namely Karnal, Panchkula, Panipat, Rohtak, Sonipat, Ambala) & 8 basic SCADA in 20 towns of UHBVN covering 256 no. substations & 1722 no. of 11kV feeders. Further, SCADA/DMS shall be integrated with GIS for network planning and consumer micro-level supply monitoring.

During the last five years, the purchase of RE power by Haryana Discoms has increased from 597.66 MU to 4485.63 MUs in FY 2022-23. In addition, in the last two years, 993.60 MW of RE PPAs have been signed by Haryana Discoms to increase the percentage of renewable power in its total power purchase mix.

Finally, to augment our technical capabilities, the Real-Time - Data Acquisition System (RT-DAS) - RT-DAS was implemented in the Discom in June'23, covering 100% outgoing feeders, which has helped efficiently monitor the network.

Leveraging renewable energy resources holds immense potential for a greener and more sustainable power sector. What policy framework and renewable integration roadmap has been crafted to boost the share of solar, wind and other clean sources in Haryana's energy mix over the medium to long term in an environmentally responsible manner?

In a significant move towards harnessing the potential of solar energy, the Government of Haryana has introduced a draft of a revamped solar power policy titled "Haryana Solar Power Policy 2023." Discussions with key stakeholders are underway to finalise the Policy. Haryana has achieved its RPO targets for FY 2022-23 & 2023-24.

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There is a focus on procurement of nuclear power as well. NPCIL's Gorakhpur Nuclear Power Plant of 2x700 MW is currently under construction in Gorakhpur village of Fatehabad district. Haryana Discoms will purchase atomic power from this plant.

Please highlight some impactful collaborations and technological interventions that UHBVN has spearheaded to bolster operational efficiencies and augment power augmentation efforts.

To implement the energy efficiency programs to reduce overall electricity demand and alleviate stress on the distribution system, UHBVN has signed a MoU with the Bureau of Energy Efficiency (BEE) to implement Demand-side Management programs in UHBVN

jurisdiction. Further, discoms have taken various initiatives in the way of the UJALA scheme in which energy-efficient appliances have been distributed under UHBVN jurisdiction area, mandatory installation of 3-star rated agricultural pump sets for release of new connection, installation of micro-irrigation systems to save electricity, replacement of inefficient Air-conditioners with efficient air-conditioners and to incentivise the customers to adopt demand response measures and participate in energy conservation programs.

Enhancing operational efficiency requires implementing a robust asset management system to optimise the lifecycle of distribution assets. UHBVN has completed mapping its electrical assets (viz. Substations, HT/LT network, Distribution Transformer, poles, etc.) up to DT level for all subdivisions and the LT network. The GIS database has mapped 608 Substations, 6116 feeders covering 68,080 km of HT line, 2386 km of EHT network, and 2,90,325 distribution transformers. This could facilitate regular maintenance, condition monitoring, and prioritising asset upgrades or replacements based on performance indicators.

What steps is the organisation taking to enhance consumer satisfaction, empower marginal consumers, bolster consumer advocacy and boost overall ease of business?

Haryana Electricity Regulatory Commission (HERC), through the 'Standards of Performance of Distribution Licensees and Determination of Compensation Regulations, has notified timelines for power disruption and release of connections. Adherence to the above has been a constant endeavour of the discom. Using customer engagement platforms to provide real-time information on energy outages, billing inquiries, and bill payments is now possible with the WhatsApp chatbot. UHBVN has also made the Trust reading Mobile App functional since 1st Feb 2024. This application allows consumers to generate monthly bills, offering flexibility in payment frequency. Proactive communication with customers improves satisfaction among consumers.

UHBVN is committed to raising marginal consumers' living standards in the State. Hon'ble CM, also the Finance Minister, has announced removing Fixed Minimum Monthly Charges for consumers with consumption of up to 100 units per month and connected loads of up to 2 KW. It is a one-of-a-kind intervention in the country and will likely benefit 8 Lakh families in the state, giving them relief to Rs 275 crores. Further, the Default Settlement Scheme targeting Antyodaya families with a vision to help the families who are among the poorest has been launched by UHBVN.

What is the future roadmap envisaged to place UHBVN at par with global benchmarks of excellence in electricity access and customer services? Please share your vision for power development in the state through a sustainable, robust, people-centric power sector.

UHBVN has the vision of becoming a frontrunner power distribution utility through a technology & consumer-centric approach. UHBVN is targeting to replace all 36 lac consumer meters with Smart Meters have prepaid billing with end-to-end Feeder & DT-level energy auditing under the RDSS scheme. It is planned to replace all the meters by Dec'26.

UHBVN aims to give each consumer category round-the-clock, reliable, quality power. To achieve this, UHBVN intends to implement the city-level SCADA with field automation for safe, reliable, and real-time operations of the Switchgears. It will also help us track outages in real-time and identify the root cause of the breakdowns.

UHBVN intends to have more IT penetration in its operations as we believe IT will enable more sustainable changes in operations by increasing controls at all levels. IT will also help improve the efficiency of operations and transparency across organisations.

Further, in line with the vision to empower farmers of Haryana and encourage them to use renewable energy sources for energy requirements in agriculture, UHBVN intends to provide daytime electricity to AP consumers from renewable resources by implementing the PM KUSUM Scheme.

Compressed Biogas Project in Haryana Signals India's Transition Towards Sustainable Energy

In a significant stride towards sustainable energy solutions, a Compressed Biogas (CBG) or Renewable Natural Gas (RNG) project has been successfully commissioned in Karnal, Haryana, as part of the Centre's Sustainable Alternative Towards Affordable Transportation (SATAT) initiative. Led by LR Energy, this pioneering project utilizes waste from the sugar industry and agricultural residues as feedstock, marking a crucial advancement in India's renewable energy sector.

The initiative boasts a production capacity of 2000 metric tonnes per annum (MTPA) of CBG and 9000 MTPA of FOM (Fertilizer Organic Manure). This achievement directly contributes to the fulfillment of Sustainable Development Goals (SDGs), notably focusing on affordable and clean energy, decent work and economic growth, industry innovation and infrastructure, and climate action.

The inauguration of the CBG project underscores a steadfast commitment to aligning with national initiatives aimed at fostering a cleaner, greener future for India. It symbolizes a pivotal step towards supporting India's ambitious goal of becoming a gas-based economy. LR Energy's vision extends beyond the immediate project, as the company intends to broaden its green portfolio with over 20 additional projects across North India. This expansion represents a substantial cumulative investment of Rs 600 crore (approximately US$70 million).

One of the noteworthy aspects of LR Energy's initiative is the establishment of long-term commercial agreements with key stakeholders in the energy sector. The company has secured a 15-year agreement with Indian Oil Corporation Limited, a leading energy company in India. Additionally, LR Energy has entered into a Tripartite Agreement with GAIL India and GAIL Gas Limited, further solidifying its commitment to sustainable energy practices and collaborations within the industry.

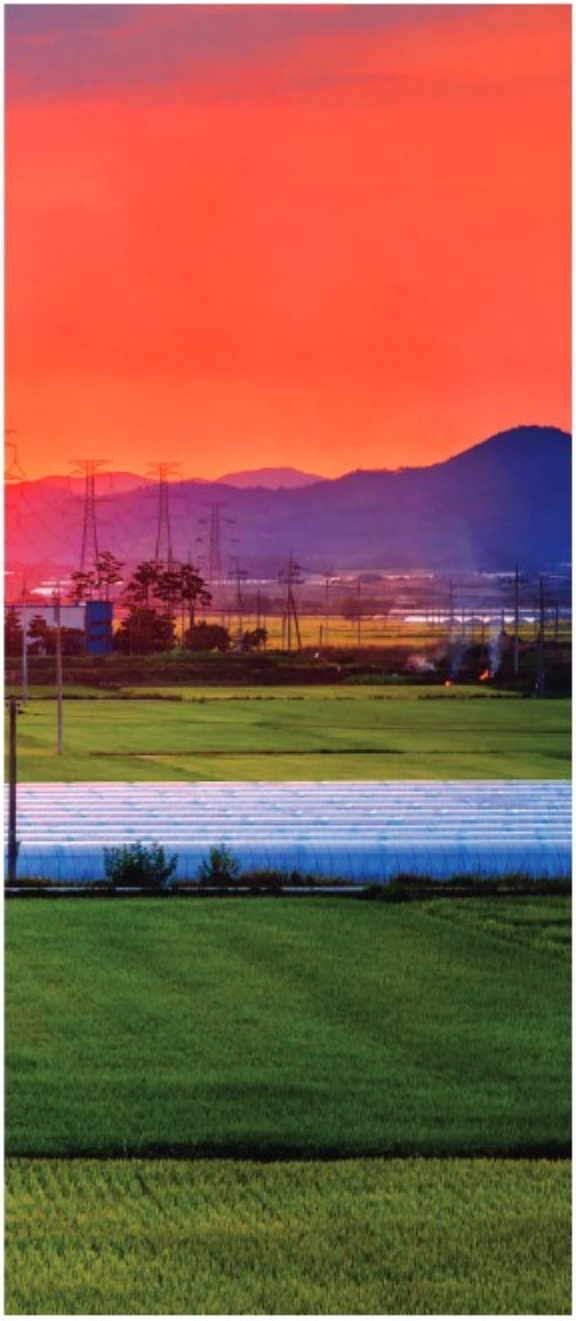
The significance of the CBG project in Karnal extends beyond its immediate environmental and economic impact. By effectively utilizing waste streams from the sugar industry and agricultural residues, the project exemplifies the potential of circular economy principles in addressing pressing environmental challenges while simultaneously generating renewable energy resources. This holistic approach mitigates waste disposal issues and contributes to reducing greenhouse gas emissions, fostering a more sustainable energy ecosystem.

Moreover, the successful implementation of the CBG project in Karnal sets a precedent for similar initiatives nationwide. It serves as a testament to the viability of renewable energy solutions, particularly in agricultural regions with abundant organic waste resources. By leveraging indigenous resources and innovative technologies, India can harness its vast potential for renewable energy production while simultaneously addressing environmental concerns and fostering economic growth.

In conclusion, commissioning the Compressed Biogas project in Karnal represents a milestone in Haryana's transition towards sustainable energy solutions. Through strategic partnerships, innovative technologies, and a steadfast commitment to environmental stewardship, initiatives like these pave the way for a more resilient and inclusive energy landscape. As India prioritizes renewable energy investments and initiatives, projects such as this serve as beacons of progress towards a cleaner and more sustainable future.

GENERATING FOR GENERATIONS in a Sustainable & Responsible Manner

» **DR. P. ANBALAGAN**
Chairman & Managing Director
Maharashtra State Power Generation Company Limited



India's power needs are soaring due to rapid development, urbanization, and population growth. Meeting these escalating demands in an environmentally sustainable way requires a holistic long-term approach. Responsible power generation balances economic needs with environmental stewardship through research, policies, and innovative clean technologies that consider both present and future needs.

A multifaceted solution is needed as energy is integral to economic activity. Responsible production minimizes environmental impacts by prioritizing renewable resources harnessed efficiently. It optimizes consumption through demand management and smart grid solutions to curb waste. Adopting emerging technologies that support sustainability goals also helps secure energy access for generations to come.

Achieving such responsible growth involves harnessing energy sources and associated infrastructure like storage in ways that reduce long-term impacts. It extends beyond fuel types to encompass efficient usage, community programs, and new solutions. For example, India has set ambitious targets of 500 GW non-fossil capacity by 2030 and carbon neutrality by 2070 to transition to more sustainable options over time.

This balanced long-term vision guides organizations like Mahagenco in powering Maharashtra's development while preserving natural assets for future generations through their renewable expansion plans and stringent pollution controls. A multipronged approach considering both existing needs and environmental protection over the long run is thus essential to ensure reliable and affordable energy access sustainably.

MAHAGENCO OVERVIEW

Maharashtra State Power Generation Company Ltd (Mahagenco) was established in 2005 after the restructuring of the Maharashtra State Electricity Board (MSEB) and as of date, it has a total balanced power generation capacity of 13170 MW comprising a Thermal power capacity of 9540 MW, Gas 672 MW, Hydro 2580 MW and Solar Power 378 MW. Mahagenco is the company with the highest power generation capacity among all State Power Generation Companies in the country. It is also the second largest power generation company in India after NTPC Limited.

The emerging scenario of the Power sector in India provides significant risks to conventional generators and at the same time provides ample opportunities for growth through the integration of technologies with renewable power. Accordingly, Mahagenco has identified its areas of weaker area of various projects as well as existing plant activities which require consistent improvements with corrective, preventive, predictive & innovative actions – Essential Renovation & Modernization, Spares & Resource Management, Coal availability, and its competitive sourcing are the top priority elements. At the same time, Mahagenco is planning its O&M initiatives to achieve regulatory parameters and also reduce disallowances to ensure full fixed cost recovery.

Mahagenco aims to build a 'Green Maharashtra' using non-conventional green energy and providing the maximum and cheapest electricity to the people of Maharashtra. Considering the future need for green energy, Mahagenco is taking various measures to increase the capacity of Renewable Energy projects including solar projects. As per the Renewable Energy Policy of the Government of Maharashtra, the following activities will be implemented in the next few years to develop various eco-friendly renewable energy projects and to meet the increasing demand for electricity in the state of Maharashtra.

- Mahagenco is focusing on the RE bundling scheme as per guidelines of the Ministry of Power, Government of India. The bundling scheme is helpful to achieve a minimum 43.33 % share of RE energy up to 2029-30 by minimising thermal energy with renewable energy to reduce environmental impact. Accordingly, a minimum target of 1692 MW capacity has been given to Mahagenco up to

2025-26. In addition to bundling, MoP has issued a resolution dated 27.02.2023 regarding 40 % RGO for units commissioned after 1st April 2023. Accordingly, Mahagenco has planned to commission 2234 MW solar projects under bundling & RGO schemes by the year 2026.

- It will also make a foray into Energy Storage Solutions such as battery storage & Pump Storage plants, an emerging area that can play an important role in grid integration & balancing of variable generation sources. The organisation is committed to green energy generation in line with guidelines from GoI/GoM from time to time for achieving the further goal of De-carbonization to minimise carbon footprint. The CMAGF scheme will help to reduce the existing load on agriculture feeders resulting in minimum distribution losses and daytime reliable green energy to the farmers. Mahagenco Renewable Energy Limited is formed as a new RE Company which will further help to diversify the business of Mahagenco.
- Mahagenco has undertaken several measures to control pollution, hazardous waste management, and ash utilisation. The aim is to meet the norms prescribed by the competent authorities and play the role of an environmentally responsible organization. The basic thrust areas for Mahagenco in this regard are environment protection, ash utilisation, community development, and energy conservation. It believes in the uplift and empowerment of the local communities in and around its project sites, especially about their human development index.
- The organisation strongly believes in the conservation of natural resources through the maximum recycling of resources. Towards this purpose, Mahagenco has ash water recovery systems, effluent treatment plants, and the like.

Mahagenco aims to build a 'Green Maharashtra' using non-conventional green energy and providing the maximum and cheapest electricity to the people of Maharashtra.

Rainwater harvesting is also being practised to support water criticality. A Green belt has been developed by planting a large number of trees in the power station colony area of Mahagenco. Tree plantation is one of the most effective tools for the elevation of deteriorated environmental conditions. All TPSs of Mahagenco meet the norm of a minimum of 33% tree plantation in open areas.

- While conserving the environmental aspects, a sincere effort is being made by Mahagenco to bring the carbon footprint from its power stations to zero or negligible levels. The system of continuous monitoring of air quality has been installed at different places in the vicinity of thermal power stations.
- Mahagenco is concentrating on emerging trends in the power generation sector because of a more sustainable, responsible, energy-efficient, and environmentally conscious future. It is a crucial shift towards embracing 24x7 renewable energy as a core component of global energy strategies, which will reflect a collective realisation of the immediate actions to address climate change and resource sustainability, encouraging innovative solutions and fostering a deeper commitment to preserving our planet for future generations.

THERMAL/GAS CAPACITY ADDITION & MINING

- Installation of 1 X 660 MW Supercritical coal base unit at Bhusawal TPS by Mahagenco is in progress and the said project is expected to be operational in March 2024. Due to Supercritical Technology, the efficiency of the Unit will be increased and comparatively less coal will be required for power generation and the electricity consumers of Maharashtra will get the benefit of reduced variable cost. This technology will also help to balance the environment by helping to reduce the emission levels.
- In addition, 660 MW, two sets are proposed at Koradi Thermal Power Station and considering the future electricity demand, one set of 660 MW OR 800 MW at Chandrapur is under consideration.
- Mahagenco has proposed a replacement project for capacity addition at GTPS Uran 850 MW (Retrofitting/ Replacement of existing 672 MW CCPP; i.e. Capacity addition of @178 MW) in view to strengthen Mumbai Grid. Implementation of the project is subject to the availability of required gas.
- Coal Mining Agreement (CMA) for Gare Palma-II coal mine in Chhattisgarh has been signed by Mahagenco. 'Forest Clearance' and 'Environmental Clearance' are received. Pre-development activities like Mining lease, Land Acquisition etc. are in progress. Mine opening is expected in FY 2024-25.

RENEWABLE ENERGY SOLAR / WIND/ PUMP STORAGE PROJECTS: SOLAR PROJECTS

- Mahagenco has so far commissioned a total of 378 MW of

Solar Energy Projects, out of which Mahagenco has completed pilot projects of 148 MW capacity while implementing the innovative "Chief Minister Agriculture Feeder Scheme" to provide electricity supply to the farmers. The main target is to provide power for at least 12 hours a day to farmers. Since the prices of the electric supply system are cheaper, the farmers can use them as production units at lesser costs. Hence, it will boost agricultural production.

- Under the CMAGF scheme, Further Mahagenco has planned 570 MW projects under the Chief Minister Agriculture Feeder Scheme. In addition, under Chief Minister Agriculture Feeder - EOI schemes, 600 MW solar projects are planned.
- Govt. of Maharashtra has given clearance to form a Joint Venture between NTPC & Mahagenco for 2500 MW Solar Park Projects from which Mahagenco's share will be 1250 MW.
- Mahagenco proposed to develop the EPC Solar Project for RE Bundling which is the highest Solar Power Generation Plant (250 MW) in Maharashtra at Dondaicha, Dist. Dhule.
- A 105 MW floating solar power project on Irai Dam at Chandrapur is proposed under the UMREPP scheme of the Department of New and Renewable Energy (MNRE) policy under JV with SJVN. Mahagenco has prepared a RE capacity addition plan of 8644 MW up to the year 2030 which comprises Bundling with Thermal, Solar for PSP pumping, Green Hydrogen/ammonia, floating, etc projects.

PUMP STORAGE PROJECTS (PSP)

It is proposed to develop the project preferably in association with the Water Resources Department at Panshet, Varasgaon, Kodali, Koyna Dam foot, and Ghatghar @ (3350 MW) as per recent Pump Storage Project policy by the Water Resources Department, Government of Maharashtra.

OTHER RE PROJECTS

- Mahagenco has signed an MoU with Satluj Jal Vidyut Nigam Ltd (SJVN), a CPSU for the development of RE projects up to 5000 MW including Pumped Storage Plant (PSP), solar, wind, green hydrogen, floating solar, and hybrid projects.
- Mahagenco has signed an MoU with the Maharashtra Energy Development Agency (MEDA) for the development of a 120 MW wind-solar Hybrid power Project on MEDA land through JV.
- Mahagenco has signed an MoU with Mahatma Phule Krushi Vidyapeeth, Rahuri, Dist. Ahmednagar for the development of a 100 MW solar power Project on Agriculture university land.
- Green Hydrogen Project is proposed at Bhusawal Thermal Power Station for setting up 20 Nm3/hr and 500 KW solar plant. In addition, a 62 MW Solar Power Project is proposed at Paras TPS under the RE Bundling Scheme.
- RE Bundling: 1692 MW Solar power Bundling with Thermal power for maximum use of Solar RE power and saving of coal for Environmental protection, tendering process is in full swing.
- Mahagenco has collaborated with Circular Economy Alliance Australia (CEAA) and formed Maharashtra Australia Sustainable Energy Alliance (MHAUSEA) to establish a platform to forge strong technology & knowledge partnership between Maharashtra and Australia to focus on, the implementation of various RE projects, Green Hydrogen/ Ammonia, Innovations in fly ash utilisation and Carbon Capture Projects.

ENVIRONMENT SAFETY & IMPROVEMENT

FGD installation and ESP Retrofitting

- To control the pollution and emission level of the Thermal Power Plant, as per revised pollution standards of the Union Ministry of Environment, Forest and Water and Climate Change (MoEF&CC), Mahagenco has taken up the work of installation of

FGD system & ESP retrofitting for Thermal Power Stations which is in operation. LOA is issued for the installation of FGD plant 8X 500 MW, Paras 250 MW (Unit 3 & 4), Khaparkheda 210 MW (Unit 3 & 4) and Koradi 3X660 MW & 210 MW (U-6) and ESP retrofitting work at Chandrapur 500 MW (Unit 5 & 6) and work is in progress.

Coal transportation through Pipe Conveyor

- Mahagenco has decided to implement the Pipe Conveyor System for a significant reduction in dust pollution caused by heavy Road Traffic in the mine area, possible vehicle accidents will be prevented, and a reduction in loss of coal during Rail and Road transport to ensure a reliable supply of coal to Mahagenco at low cost.
- Mahagenco implemented the scheme in September 2021 for transporting coal from Bhatadi Coal Mine to Chandrapur Super Thermal Power Station through Pipe Conveyor using Pipe Conveyor which is an advanced eco-friendly technology.
- The scheme for transportation of coal through pipe conveyors from Gondegaon, Bhanegaon, Singori coal mine etc to Koradi and Khaparkheda TPS is in progress and is expected to be commissioned in the year 2023-24.

Ash Management

For 100% recycling of fly ash generated after coal combustion, various initiatives are implemented by Mahagenco. This ash is made available through silos almost free of charge or at very low cost to the interested industries. Mahagenco intends to set up a cement plant/state-of-the-art unit cement plant at Koradi, Khaparkheda, and Chandrapur thermal power stations and is also planning to set up fly ash bricks clusters in the area for traditional brick kiln holders.

Sewage Treatment Plant

- Mahagenco and Nagpur Municipal Corporation have jointly commissioned a 130 MLD Sewage Treatment Plant at Bhandewadi for supplying water to Koradi Power Station.
- 190 M.L.D. capacity Sewage Treatment Plant is commissioned in which 90 MLD of treated sewage is being used for Koradi Thermal Power Station and 100 MLD of treated sewage is being used for Khaparkheda Thermal Power Plant.
- For the 79 MLD sewage treatment plant at Chandrapur, about 90% work has been completed and the supply of 50 MLD sewage water will be started soon.
- Construction of sewage treatment plants is also proposed at Bhusawal, Parli, and Paras.

Tree Plantation

A green belt has been developed by planting a large number of trees in the power station colony area of Mahagenco. Tree Plantation is one of the most effective tools for the elevation of deteriorated environmental conditions. All TPS of Mahagenco meet the norm of a minimum of 33% Tree Plantation in open areas.

MAHAGENCO WAY AHEAD

Mahagenco is leveraging new, clean technologies for the seamless integration of renewable energy into the grid. It has similarly undertaken various new initiatives for digitalisation and to improve the efficiencies of the coal value chain. Mahagenco is looking into asset performance management, station heat rate optimisation, floating solar plants, hybrid plants, flexibilization of existing thermal plants, and robotics and automation to control critical activities. With all these efforts, Mahagenco will be able to provide high-quality customer service and foster the socioeconomic growth of our state, thereby serving our nation.

The organisation is going for thermal generation in an eco-friendly manner and also progressing towards non-conventional energy sources mainly Solar, Wind, and PSP energy with an ambitious plan of its massive capacity addition, which will help Mahageno to be a power-generating entity worth 25+ GW by 2030.

In conclusion, sustainable & responsible power generation is a multifaceted approach that goes beyond meeting the current energy needs. It involves a conscientious effort to protect the environment, promote sustainability, and ensure a legacy of clean energy for generations to come.

Views expressed by: **Dr. P. Anbalagan,** *Chairman & Managing Director, Maharashtra State Power Generation Company Limited*

Decoding Environmental Injustice: Unmasking Biases in India's EPI Ranking

"India's place at the bottom of the Environmental Performance Index– is the ranking fair or flawed?"

In the realm of global environmental assessments, the Environmental Performance Index (EPI) serves as a benchmark for nations worldwide. However, the latest edition of the EPI in 2022 should ignite a fierce debate in India, where the nation finds itself at the bottom of the rankings. Beyond the headlines, a closer inspection reveals a web of biases that challenge the credibility of the assessment and question its applicability to developing nations like India.

The EPI is fraught with biases that disproportionately disadvantage developing nations. India, with its unique challenges, has raised several valid concerns, leading to a robust examination of the assessment's methodologies and indicators.

» SUMAN CHANDRA, IAS
Deputy Secretary, Ministry of New and Renewable Energy (MNRE)
Government of India

One of the primary concerns lies in the choice of indicators used in the EPI. For instance, the stringent air quality standards set by India, although more rigorous than those of some developing countries, are still lower than those of developed nations. This paradox places India at a disadvantage, highlighting the unsuitability of certain indicators for making fair cross-country comparisons.

Another critical concern surrounds the reliability of the data used for developing countries in the EPI. With data collection methodologies varying widely across nations, questions arise about the accuracy and representativeness of the information. This, in turn, has the potential to misrepresent India's true environmental performance, exacerbating the biases embedded in the index.

The EPI's approach also contains the subjectivity inherent in certain indicators and the weighting assigned to different environmental issues. Subjective assessments and imbalanced weights skew results against India's priorities. The failure to adequately consider India's unique challenges, such as rapid urbanization, poverty, and

resource limitations, raises questions about the fairness of the assessment.

Critics assert that the EPI, in its pursuit of evaluating environmental outcomes, overlooks the context and ongoing efforts in developing nations. India's ambitious initiatives aimed at improving environmental performance, from renewable energy projects to biodiversity conservation, seem to be lost in the numerical shuffle. The EPI's focus on outcomes without considering the journey undermines the credibility of the assessment.

The Indian Ministry of Environment has officially criticized the EPI 2022, asserting that the index relies on "unfounded assumptions" and "unscientific methods." The government rightly contends that the EPI paints an inaccurate picture of India's environmental performance, emphasizing the nation's strides in renewable energy, forest cover, and biodiversity conservation.

While criticisms abound, proponents of the EPI acknowledge its limitations but argue that it provides a necessary tool for benchmarking and tracking environmental progress across nations. They stress the importance of holding all countries, including developing ones, accountable for their environmental performance. Advocates also highlight the need for developing countries to improve data collection and transparency to ensure accurate assessments, emphasizing the universal applicability of such standards.

From a data and policy perspective, it is imperative to address data gaps and engage in constructive dialogue pivotal for a nuanced and accurate understanding of environmental challenges and progress in developing nations like India. The EPI, while a valuable tool, should evolve to consider the unique contexts and challenges faced by countries in various stages of development.

The call for addressing data gaps echoes across various expert circles. Developing countries, including India, are in the process of building robust data collection and monitoring systems. This includes investments in technology, training personnel, and establishing clear data governance protocols. Leveraging local knowledge and citizen science, fostering collaboration and data sharing, and embracing new technologies can contribute to a more comprehensive picture of environmental issues in the future.

Open dialogue and collaboration between developing country representatives, environmental experts, and the EPI creators are crucial for improving the fairness and accuracy of the index. Policymakers and researchers should engage in inclusive stakeholder dialogues, ensuring diverse perspectives are considered. Open and transparent communication about data limitations and uncertainties can prevent misinterpretations, fostering a sense of collective responsibility for addressing environmental challenges.

Indian Perspective

From the Indian perspective, strengthening air quality monitoring systems in rural areas, engaging local communities in water management, utilizing satellite data for deforestation monitoring, and organizing multi-stakeholder forums on climate change can be robust steps forward. By addressing data gaps and engaging in constructive dialogue, India can gain a deeper understanding of its environmental challenges and opportunities, paving the way for more effective and tailored policies. India is already on the right path with its focus on Digital India.

The EPI's metrics could be enhanced to provide a fairer and more nuanced picture of India's environmental performance. Inappropriate indicators, data quality and availability issues, subjectivity in weighting, and potential biases are areas that need attention. Developing context-specific assessments, increasing weight on relevant efforts like clean energy, improving data collection, and fostering open

dialogue can transform the EPI into a more valuable tool for supporting environmental progress in developing countries.

From the perspective of a renewable energy expert in India, additional concerns arise. The EPI's focus on outcomes over efforts disregards India's significant strides in promoting renewable energy. Unfair weighting of indicators, such as air quality, may penalize developing countries despite their efforts to transition to cleaner energy sources. Some indicators may be inapplicable or outdated for comparing developed and developing nations.

To address these concerns, refining indicators and data collection methods through collaboration with developing countries, especially India, which has the greatest number of people in the world and has a massive global footprint, investing in data infrastructure and capacity building, adopting context-specific assessments, and promoting open dialogue to improve fairness and accuracy will be a game-changer.

In the grand tapestry of global environmental assessments, the EPI plays a crucial role. However, the controversies surrounding India's ranking in the latest edition underscore the need for continuous improvement and adaptability of tools like EPI. An unbiased, nuanced, and context-specific evaluation is not just the demand of the hour but a prerequisite for steering the world towards a more sustainable future. As the debates rage on, one thing is clear – the path forward must be paved with collaboration, transparency, and an unwavering commitment to environmental justice for all nations.

The EPI's metrics could be enhanced to provide a fairer and more nuanced picture of India's environmental performance. Inappropriate indicators, data quality and availability issues, subjectivity in weighting, and potential biases are areas that need attention.

In cultivating high performers, the emphasis should lean towards offering more carrots than wielding sticks, fostering a positive and motivational environment that inspires excellence. India is a globally recognized leader in sustainable practices and clean energy acceleration. Biased tools, therefore, can be counterproductive in global efforts to fight climate change.

The importance of tools like the Environmental Performance Index (EPI) becoming inclusive and unbiased cannot be overstated, particularly in the context of the arduous journey that developing countries undertake to address climate change impacts, often not caused by them. Climate change knows no borders, and its consequences disproportionately affect vulnerable nations that contribute the least to global emissions. In this scenario, tools such as the EPI must evolve to reflect the unique challenges faced by developing countries, acknowledging the historical context, economic constraints, and priorities that shape their environmental policies. Failure to achieve inclusivity and impartiality in these assessments risks undermining the genuine efforts of developing nations to combat climate change and hampers their ability to access international cooperation. It is crucial that such tools foster a fair and comprehensive evaluation, recognizing the shared responsibility of all nations in crafting sustainable solutions for a global challenge. Only through inclusivity and unbiased assessments can the international community collectively address climate change and work towards a more equitable and sustainable future.

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*Views expressed by: **Suman Chandra, IAS**, Deputy Secretary, Ministry of New and Renewable Energy (MNRE), Government of India.*

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Event Report

The **5th Elets National Energy Summit**, organised by Elets technomedia in collaboration with the **Punjab Energy Development Agency (PEDA)**, occurred on May 24, 2023, at The Lalit in Chandigarh. The summit brought together key stakeholders from the energy sector to discuss and explore innovative solutions for advancing smart and sustainable energy practices & highlighted Punjab's exceptional strides in clean and green energy.

The summit featured many discussions and presentations on topics crucial to the energy sector's sustainability. Notably, Elets eGov special issue was launched during the event,

showcasing the latest developments and initiatives in the energy domain. The summit also saw the participation of esteemed speakers and panelists who shared their insights and expertise.

Sh. Tejveer Singh, Principal Secretary, Department of Power and Governance Reforms, Government of Punjab, delivered a special address highlighting Punjab's remarkable progress in renewable energy and the state's role in shaping the national discourse on India's energy transition. Sh. HS Hanspal, Chairman of the Punjab Energy Development Agency, also addressed the importance of building sustainability through green and clean energy generation.

Caroline Rowett, Deputy High Commissioner of the British Deputy High Commission in Chandigarh, provided introductory remarks, emphasizing the significance of collaborative efforts in driving energy sector advancements. A Venu Prasad, Additional Chief Secretary, New and Renewable Energy, Government of Punjab, delivered the keynote address, shedding light on new and alternative energy technologies and the National Hydrogen Mission.

In his address, **Dr. Ravi Gupta, editor-in-chief of eGov Magazine**, commended Elets Technomedia for its two-decade-long efforts in fostering ICT-based solutions pertaining to the critical sectors of the economy. He recognized Punjab's exemplary achievements in renewable energy and technology adoption, inspiring other states.

The summit featured panel discussions on various crucial topics, including the blueprint for a sustainable future, advancing smart and sustainable energy, building sustainability through green and clean energy generation, new and alternative energy technologies, clean energy technologies, the National Hydrogen Mission, emerging technologies for energy transmission and distribution, and the role of banks and institutional finance in capacity building and energy infrastructure development.

Key Takeaways

Dr. Ravi Gupta, Editor-in-Chief, eGov Magazine

For the past twenty years, Elets Technomedia has been fostering ICT-based solutions to shape critical sectors of the economy, namely governance, health, finance, and education. It has been serving as a knowledge-sharing platform ever since its inception.

Punjab is a state that has done a remarkable job in renewable energy and leveraged technology, complemented by significant government policies and initiatives. It is showing the way forward to other states.

With a focus on shaping the country's energy sector trends, Elets 5th National Energy Summit is an attempt to mainstream and highlight Punjab's phenomenal strides towards clean and green energy.

Sh. Tejveer Singh, Principal Secretary, Department of Power and Governance Reforms, Government of Punjab

Sustainable Energy simply refers to any energy ecosystem that does not compromise the interests of posterity while fulfilling the needs of the present.

We live in a time when energy needs are becoming increasingly paramount in pursuing economic growth and development. Easy power availability, affordability, reliability, and environmentally friendly and resilient infrastructure are essential for sustainable energy.

I would like to thank Elets Technomedia and PEDA for organizing such an excellent summit that will undoubtedly shape the trends in the energy sector.

Sh. HS Hanspal, Chairman, Punjab Energy Development Agency

Conventional energy, derived from coal, gas, and petroleum, generates excessive carbon dioxide, leading to unprecedented environmental impacts. Global regions are experiencing extreme weather conditions, emphasizing the urgent need to transition towards cleaner and renewable energy sources.

While India has made significant efforts to harness solar energy, it has yet to fully utilize its solar potential, unlike countries such as the UK, which utilize solar energy more efficiently despite having less sunshine yearly.

I thank Elets Technomedia and PEDA for organizing the 5th Elets National Energy Summit in Punjab. The ideas and best practices shared during this event will play a crucial role in shaping the future of India's energy sector.

Caroline Rowett, Deputy High Commissioner, British Deputy High Commission, Chandigarh

Climate change is the world's most serious issue today, resulting in extreme weather events across the globe. It significantly challenges livelihoods, jobs, and the natural environment.

The UK aims to reach net-zero status by 2050, so it is transitioning to a completely carbon-free electricity system. Most of the energy supply will be met by renewable energy sources such as wind, solar, hydroelectric, and bioenergy.

In 1994, the UK could generate only 2 percent of its electricity from renewable sources. However, by 2020, that figure had reached 43 percent, underscoring the UK's significant transition towards renewables. The Elets 5th National Energy Summit is a timely event to discuss the challenges and road ahead pertaining to India's energy transition.

Sh. A Venu Prasad, Additional Chief Secretary, New and Renewable Energy, Government of Punjab

I thank Elets Technomedia for organizing its 5th National Energy Summit in Punjab and making PEDA the associate partner for this event. This summit is an important event that has brought together key stakeholders, including government officials, industry experts, scientists, and companies involved in the energy sector, under one roof to discuss innovative solutions, share best practices, and shape the future of the energy sector.

We will face challenges transitioning from conventional energy sources to more advanced and non-conventional ones. This is where a summit like this helps minimize such challenges by highlighting the recent technological solutions, best practices, and innovative ideas implemented in different parts of the country and the globe.

Navjot Singh, Chairman, Punjab Genco

Punjab is currently facing a significant challenge in stubble burning, and the most effective solution to combat this problem is through green energy. Demonstrating its dedication, Punjab has taken a significant step forward by establishing the largest compressed biogas (CBG) plant in Sangrur, Asia.

This plant is proving to be a revolutionary development in addressing the issue of stubble burning. By implementing this plant, Punjab is making strides in restoring and preserving its environmental beauty, effectively reducing pollution levels. I thank Elets Technomedia and PEDA for organizing the 5th National Energy Summit, a crucial event in the present circumstances.

E.N. EZE, High Commission of Nigeria to India, New Delhi

The relationship between Nigeria and India has been friendly and enduring, leading to substantial cooperation across various sectors of the economy. Nigeria holds significance for India's energy sector, supplying thirty percent of India's crude oil requirements. Both countries are actively working on enhancing collaboration in the renewable energy field.

With the global focus shifting towards clean and sustainable energy and the pursuit of net-zero emissions taking center stage in global discussions, events like the Elets 5th National Energy Summit are crucial in expediting the transition to cleaner energy sources. I thank Elets Technomedia and PEDA for hosting this timely summit.

Bhaskar Sarkar, Chief Executive Officer, TP Northern Odisha Distribution Ltd

The responsibility for the energy ecosystem primarily rests on the distribution and transmission system, which can be likened to the nervous system of our body, responsible for circulating blood throughout the entire body. Similarly, the transmission and distribution system is crucial in distributing energy throughout various parts of the country.

In light of the increasing intermittent energy supply from different regions, enhancing the transmission system's efficiency, resilience, and proactiveness is essential. We can use emerging technologies such as Data Analytics to address the current shortcomings and transform the system to achieve this goal.

I thank Elets Technommedia and PEDA for organizing the 5th Elets National Energy Summit. The ideas exchanged during this event will catalyze India's progress in adopting clean energy.

Arup Chandra Sarmah, Chief Commercial Officer, ONGC Tripura Power Company Limited (OTPC)

ONGC Tripura Power Company Limited (OTPC), officially recognized as a gas-based power plant, is erroneously perceived as a source of clean energy due to its utilization of fossil sources. However, we are also making efforts to participate actively in the renewable energy sector. Accordingly, we have collaborated with various state beneficiaries and are trying to meet their energy requirements sustainably.

On a pilot-case basis, OTPC has collaborated with Assam Power Distribution Company Limited (APDCL) to develop a phased battery energy storage system (BESS) project in Assam.

I thank Elets Technomedia and PEDA for this wonderful knowledge-rich summit, which is the need of the hour for shaping the trends in the energy sector.

Sakatar Singh Bal, Additional State Transport Commissioner, Government of Punjab

The government of Punjab has undertaken numerous initiatives, and the electric vehicle policy has been officially implemented in the state. We are actively working towards implementing these policies in Punjab. An apex body consisting of community ministers of transport and various departments has been established to oversee these efforts.

Five cities in Punjab, Amritsar, Jalandhar, Ludhiana, Bhatinda, and Patiala, are grappling with severe pollution problems, as they account for 50% of the total emissions. In the initial phase, the Punjab government prioritizes implementing these policies in these five cities. Consequently, district-level implementation committees have been formed in each city as part of this policy.

Madhu Mishra, Senior Adviser, Economics, Climate and Development, British Deputy High Commission

We are government representatives from the department known as the Foreign Commonwealth & Development Office, part of the UK Government. In India, our work covers various issues, including climate change and renewable energy, such as electric mobility, forestry, green hydrogen, and other related areas.

One of our programs, the UK Pact (Partnering for Accelerating Climate Transitions), focuses on collaborating with city administrations in Chandigarh and Shimla to develop a roadmap for sustainable mobility. Through this program, we aim to establish international partnerships between UK cities and their counterparts in India.

Animesh Mishra, Head of Sales & PR, Energy Efficiency Services Ltd (EESL)

In India, more than 43% of our energy is installed and utilized from renewable sources. It's crucial to understand the role we play in this process. When energy is generated, a significant amount of raw material is used, resulting in considerable waste. The renewable energy produced at the end is only a fraction of what is initially generated. It accounts for around 30-40% of the total, while fossil fuel-based energy makes up 80%.


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