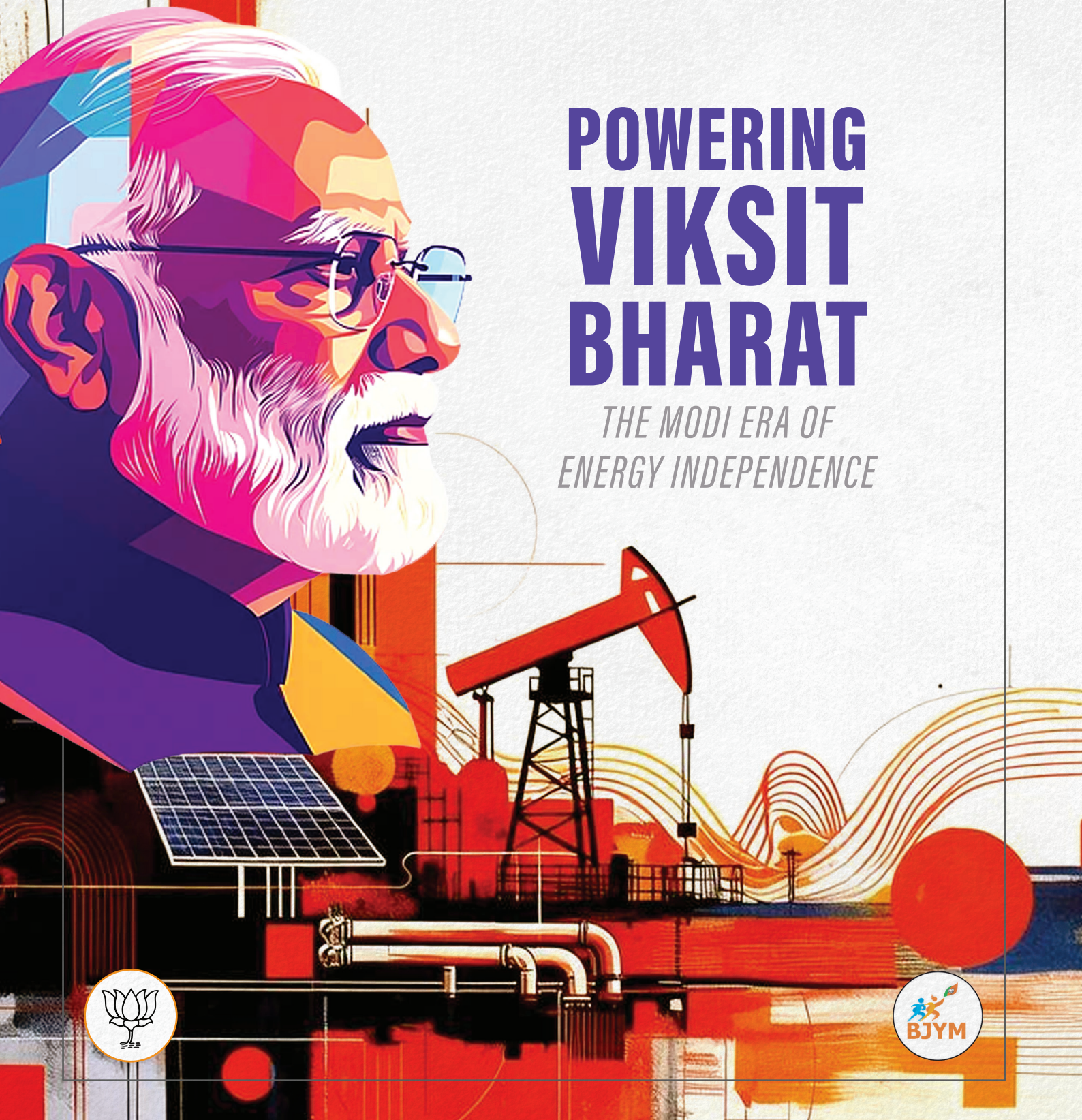
BJYM Magazine

OCTOBER 2025 VOL 49



POWERING VIKSIT BHARAT

THE MODI ERA OF ENERGY INDEPENDENCE

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Our goal is to produce five million metric tons of green hydrogen annually by 2030. These targets may seem ambitious, but Bharat's achievements over the past decade give us confidence that we will accomplish them.

Prime Minister
Shri Narendra Modi

Every expert in the world today is saying that the 21st century belongs to Bharat. Bharat is driving not just its own growth but the growth of the world as well, and our energy sector plays a significant role in this. Bharat's energy ambitions stand on five pillars: We have resources that we are harnessing. Second, we are encouraging our brilliant minds to innovate. Third, we possess economic strength and political stability. Fourth, Bharat's strategic geography makes energy trade more attractive and easier. And fifth, Bharat is committed to global sustainability. These factors are opening up new opportunities in Bharat's energy sector.

The next two decades are crucial for a 'Viksit Bharat' (Developed India), and in the next five years, we will cross many significant milestones. Many of our energy goals are aligned with the 2030 deadline. By 2030, we aim to add 500 gigawatts of renewable energy capacity. Indian Railways has set a target to achieve net-zero carbon emissions by 2030. Our goal is to produce five million metric tons of green hydrogen annually by 2030. These targets may seem ambitious, but Bharat's achievements over the past decade give us confidence that we will accomplish them.

Over the last 10 years, Bharat has transformed from the tenth-largest to the fifth-largest economy. In this period, we have increased our solar energy generation capacity by 32 times. Today, Bharat is the third-largest solar power-generating nation in the world. Our non-fossil fuel energy capacity has tripled. Bharat was the first G20 country to meet the Paris Agreement goals ahead of schedule. One example of how Bharat achieves its goals ahead of time is ethanol blending. Bharat is currently blending 19 per cent ethanol, which has led to foreign exchange savings, substantial revenue generation for farmers, and a significant reduction in CO2 emissions. We are on track to achieve a 20 per cent ethanol mandate before October 2025. Bharat's biofuels industry is poised for rapid growth. We have a sustainable feedstock capacity of 500 million metric tons. Under India's G20 presidency, the Global Biofuels Alliance was established and continues to expand, with 28 nations and 12 international organisations joining. This initiative is transforming waste into wealth and establishing Centres of Excellence.

Remarks of Prime Minister **Shri Narendra Modi** at India Energy Week 2025

Bharat is continuously implementing reforms to fully explore the potential of its hydrocarbon resources. Due to major discoveries and the extensive expansion of gas infrastructure, our gas sector is expanding. This has increased the share of natural gas in our energy mix. Currently, Bharat is the fourth-largest refining hub and is working to increase its refining capacity by 20 per cent.

Our sedimentary basins hold numerous hydrocarbon resources. While many have already been identified, several remain unexplored. To make Bharat's upstream sector more attractive, the government has introduced the Open Acreage Licensing Policy (OALP). Whether it's opening the Exclusive Economic Zone or establishing a single-window clearance system, the government has provided comprehensive support to this sector. Following amendments to the Oilfields Regulation & Development Act, stakeholders now benefit from policy stability, extended leases, and improved financial terms. These reforms by the government will simplify the exploration and production of oil and gas resources in marine areas, as well as the maintenance of strategic petroleum reserves.

Due to numerous discoveries and the expanding pipeline infrastructure in Bharat, the supply of natural gas is increasing. As a result, the use of natural gas is also set to grow in the coming years, creating numerous investment opportunities for you in this sector.

Bharat is currently placing a strong emphasis on Make in India and strengthening local supply chains. There are vast opportunities for manufacturing various types of hardware, including PV modules, in Bharat. We are actively supporting local manufacturing. In the past decade, Bharat's solar PV module manufacturing capacity has grown from 2 GW to around 70 GW. The Production-Linked Incentive (PLI) scheme has made this sector even more attractive, boosting the manufacturing of high-efficiency solar PV modules.

There are immense opportunities for both innovation and manufacturing in the battery and storage capacity sector. Bharat is rapidly moving toward electric mobility. To meet the demand of such a large country, we need to accelerate efforts in battery production and storage capacity. Therefore, this year's budget includes several announcements to support green energy. The government has removed basic customs duties on various components related to EV and mobile phone battery manufacturing, including cobalt powder, lithium-ion battery waste, lead, and zinc, among other critical minerals. The National Critical Minerals Mission will play a key role in establishing a robust supply chain in Bharat. Additionally, we are promoting the development of a non-lithium battery ecosystem. This year's budget has also opened up the nuclear energy sector. Every investment in energy is creating new job opportunities for young people and generating green jobs.

The next two decades are crucial for a 'Viksit Bharat' (Developed India), and in the next five years, we will cross many significant milestones. Many of our energy goals are aligned with the 2030 deadline.

To strengthen Bharat's energy sector, we are empowering it with the power of the people. We have made ordinary families and farmers energy providers. Last year, we launched the PM Suryagarh Muft Bijli Yojana. The scope of this scheme goes beyond just energy production. It is fostering new skills in the solar sector, creating a new service ecosystem, and increasing investment opportunities for you.

Bharat is committed to providing energy solutions that energise our growth while enriching our nature.

Source: narendramodi.in

Remarks of the BJP President **Shri J.P Nadda**

PM-Surya Ghar: The Muft Bijli Yojana has proven to be extraordinarily successful, as over 1 crore households have already registered. It shows the trust of the people in Honourable PM Shri Narendra Modi ji and his visionary leadership. This program aims to boost energy sufficiency and production, leading to substantial cuts in household electricity expenses while also benefiting the environment positively. I would appeal to those who haven't yet registered to do so, as our government is putting forth all efforts to increase public awareness of social welfare schemes based on 'Modi ki guarantee' to achieve the dream of Viksit Bharat.

Source: Post on X

Message from the BJYM National President **Shri Tejasvi Surya**

In the last decade, under the visionary leadership of Prime Minister Shri Narendra Modi, India has not only lit every home but has also illuminated a new path of self-reliance, confidence, and sustainable growth. Our energy story today is not merely about power generation; it is about powering aspirations, industries, and dreams. It is about building an India that stands tall, independent, and resilient in a volatile world.

When Prime Minister Modi spoke of Atmanirbhar Bharat, it was not a slogan, it was a national mission. Nowhere is this more visible than in the transformation of India's energy landscape. From the barren deserts of Kutch to the solar fields of Rajasthan, from the wind corridors of Tamil Nadu to the hydropower stations in Himachal Pradesh, India has emerged as a true powerhouse of clean energy and innovation.

Over the past ten years, we have witnessed a revolution that bridges economics, ecology, and equity. Millions of women have been liberated from the smoke of chulhas through the Ujjwala Yojana. Villages that once awaited light for generations now shine under the Saubhagya scheme. Farmers are not just consumers but producers of clean energy through PM-KUSUM. Students in remote schools, factories in growing towns, and startups in emerging cities are all powered by the new confidence of a self-reliant Bharat.

Our country today is not only securing its energy but also leading the global energy transition. The International Solar Alliance, the Global Biofuel Alliance, and the National Green Hydrogen Mission are not just government programmes; they are symbols of India's moral and technological leadership. When the world debates energy transition, it looks to India for solutions that are both equitable and scalable. This is the new Bharat: assertive abroad, ambitious at home, and anchored in civilisational responsibility toward nature and future generations.

The Modi government has also recognised that energy security must rest on diversification of sources, technologies, and strategies. Alongside record growth in renewables, India has revived its nuclear energy programme, expanded oil reserves, and invested in battery storage systems to ensure 24x7 power for all. These aren't isolated projects; together, they form a robust, clean, and future-ready national security architecture for energy.

Our generation must understand that energy is the currency of modern sovereignty. A nation that controls its energy future controls its destiny. The Congress governments of the past treated this question with neglect and dependency; today, under PM Modi, India is creating a model for the world where growth and green progress go hand in hand. The journey from Energy Shortage to Energy Surplus Bharat is a story of vision and execution unmatched in our history.

As the youth of the world's youngest nation, it is our duty to carry this mission forward. The transition to a sustainable energy economy is not only a technological challenge; it is a collective responsibility. Every rooftop solar panel, every electric bus, every green hydrogen plant, and every LED bulb contributes to the dream of Viksit Bharat 2047.

Prime Minister Modi has often said that this is not just the decade of development, it is the decade of delivery. The world today acknowledges India not merely as a participant but as a leader in shaping the global energy agenda. This is our time to ensure that the light which glows in every Indian home is the light of confidence, innovation, and national pride.

Vande Mataram!

Tejasvi Surya
MP Lok Sabha,
Bengaluru South

EDITORIAL

In the decade since Prime Minister Shri Narendra Modi first spoke of an Atmanirbhar Bharat, India's energy story has undergone one of the most far-reaching transformations in the world. What began as a national struggle for fuel self-sufficiency has evolved into a sophisticated, multidimensional project, one that combines social justice, technological innovation, and global leadership. Energy is no longer viewed as a mere economic input; it has become the strategic foundation of India's sovereignty and its aspirations to emerge as a developed nation by 2047.

A decade ago, India's energy ecosystem was fragile, characterised by chronic shortages, erratic imports, and uneven access. Today, the nation is the third-largest renewable energy market globally and one of the few major economies on track to meet its Paris commitments ahead of schedule. Installed power capacity has crossed 490 gigawatts, with nearly half coming from non-fossil sources. The government's long-term vision, embodied in the National Hydrogen Mission and the 500 GW renewable target for 2030, reflects both ambition and pragmatism. The goal is clear: to secure abundant, affordable, and clean energy for 1.4 billion citizens while asserting India's rightful place in the global clean-energy order.

At the heart of this transformation is a deep moral and social vision, which PM Modi calls "energy justice." Landmark schemes such as Ujjwala Yojana and Saubhagya have not only lit up homes but transformed lives, particularly those of women in rural India. Over nine crore women have received LPG connections, liberating them from the toxic smoke of traditional chulhas. At the same time, the Saubhagya scheme has electrified nearly three crore households, achieving near-universal access to power. These interventions are not just welfare programmes; they are instruments of dignity and empowerment that have redefined development in human terms.

The energy revolution has also been industrial and strategic. India's once perilous dependence on imported crude has been mitigated through diversification, smart diplomacy, and strategic petroleum reserves. The creation of underground reserves in Visakhapatnam, Mangalore, and Padur covering over 22 days of crude oil demand has provided the country with a vital buffer against global shocks. Energy diplomacy has become a cornerstone of foreign policy, with India sourcing crude from over forty nations, signing long-term LNG contracts with the United States and Qatar, and even continuing discounted Russian imports amid Western pressure. These moves are not acts of defiance but declarations of a nation's sovereignty, determined to make decisions guided solely by its national interest.

Equally transformative has been India's emergence as a manufacturing and innovation hub for clean energy. From solar cells and wind turbines to hydrogen electrolysers and batteries, domestic production capacity is expanding at an unprecedented pace. The Production Linked Incentive scheme has attracted major players like Adani, Tata, and Reliance, while startups in solar leasing, electric mobility, and energy analytics have turned India into one of the world's most dynamic clean-tech ecosystems. These industries are not just reducing import bills; they are generating millions of green jobs and anchoring a new wave of industrialisation rooted in sustainability.

The Modi government's approach to energy security is not confined to supply, but extends to how energy is consumed. The Bureau of Energy Efficiency's star labelling, the UJALA LED programme, and the Perform, Achieve and Trade scheme for industries have collectively saved billions in energy costs while reducing millions of tonnes of carbon emissions. The nationwide rollout of smart meters and digital grids has made India's power network more transparent, responsive, and efficient. In cities, the Smart Cities Mission promotes energy-efficient lighting and waste-to-energy systems; in villages, solar microgrids and the PM-KUSUM scheme empower farmers to become power producers rather than mere consumers. This integration of technology and social purpose is what makes India's energy transition distinctively democratic.

The next frontier lies in clean fuels and hydrogen. The National Green Hydrogen Mission, with its target of five million tonnes of annual production by 2030, positions India to become a major global supplier. Hydrogen-powered buses in Ladakh and pilot projects for hydrogen-based steelmaking are early glimpses of a future where India leads industrial decarbonisation. Together with biofuels, ethanol blending, and electric mobility, this diversification reflects a forward-looking realism: the transition must be orderly, inclusive, and anchored in domestic capability. The government has revived India's nuclear energy programme, recognising it as a reliable, zero-carbon backbone

for long-term energy security. New reactor projects with global partners such as France's EDF and Russia's Rosatom at Jaitapur and Kudankulam promise to expand nuclear generation beyond 10,000 MW in the coming years. Indigenous technologies, such as the Pressurised Heavy Water Reactors developed by Indian engineers, reinforce India's self-reliance in a sector once dependent on imports. Nuclear energy, clean and continuous, adds strategic depth to the national grid, complementing solar and wind in providing round-the-clock power.

What is remarkable about India's energy journey under Modi is its balance between ambition and discipline, between global leadership and local empowerment. It is a model that blends the ethos of sustainability with the politics of self-reliance. As global energy markets reel under volatility, India's diversified and resilient energy framework has become an emblem of strategic maturity. Through international initiatives like the International Solar Alliance and the Global Biofuel Alliance, India is no longer just participating in global conversations; it is shaping them.

Cleaner Roads, Stronger Nation: Decarbonising Transport for India's Energy Resilience

Akshay Nayak
Doctoral research fellow,
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Why Decarbonization and Energy Resilience required?

Transportation is one of the most energy consumption sector with 25 to 30% global share in energy demand and approximately 18% in Indian case. Although transportation is one of critical element for growth and development. India being the fastest growing major economy in the world, it is important for the country to have a robust and efficient transport system for goods transfer and connectivity. But this comes with a major challenge of energy demand and negative externalities of transport. India imports around 88% of crude oil, 47% natural gas in year 2024 increased from 76% and 18% respectively compared to year 2006 as domestic production hardly fulfils any of the requirements. The over dependence on imported fuels, burdens the import bill amounting US$ 288 billion on fossil fuel in FY 2024. This risks the economic system based on dollar requirements and energy security for the nation. This huge consumption also results into emission of pollutants which further degrades the air quality and adds in climate change though Greenhouse Gases (12 to 14% energy related CO2 emissions out of which 90% from road transport). Use of conventional fossil fuels are the source of CO2, CO, Volatile Organic Carbon (VOC), heavy metals like lead (Pb) and Particulate Matters (PM10 etc.). These pollutants cause many harmful effects like health impacts. Climate change creates further creates natural disasters, water-food-livelihood insecurity for India.

Transport Decarbonization Tools

To overcome these challenges of energy dependence and GHG emissions with India's commitment of Nationally Determined Contributions (NDCs) in COP being a responsible member of international community, Government of India has put emphasize on decarbonizing the sector through policy instruments as well as sustainable practices. The multi-longed approached is adopted which included modal shift (use of less energy and emission intensive mode of transport), focus on alternative fuels (replacing conventional fossil fuels with electric, biofuels etc.) and change in vehicle (from car to bus). Though air transport is most energy and emission intensive (per capita or ton per kilometre) but it has a very minimal share, the focus is on road transport as it has 90% share and higher emissions-energy intensity compared to other modes i.e., rail, inland water transport.

Making Urban Transport Sustainable

Indian cities have been one of most polluted cities in the world due to its poor air quality, for example capital city Delhi faces severe air quality during winter season. To make urban commute sustainable, Government has focused on developing public transport infrastructure such as metro system in large or metro cities (248 km across 5 cities in 2014 to 1,013 km across 23 cities by May 2025, adding 763 km in just 11 years). Similarly, BRTS (bus based urban public transport system) has been developed in many cities replacing the private vehicle commute. Even better road infrastructure (fewer breaking results into lower emissions) helps in lower fuel consumption and lower emissions in the cities. Planning tools like Transit Oriented development policy (2017) which make cities pedestrian and cycle-friendly contributes in making city sustainable and more liveable.

Modal Shift from Road to Rail and Inland Water Transport

On the other hand, under the leadership of PM Modi, India is also looking towards the revamping the logistic sector. With ambitious 'PM Gati-Shakti National Master Plan', India is looking not only cost-friendly logistic (logistic cost to 8-9% compared to 13-14% of GDP), but country has also made progress towards modal shift in goods transport. Better rail connectivity with dedicated freight corridors, national rail plan is aiming to increase its share from 27% to 45% by 2030, rejuvenating inland water transport and increase the share from 2% to 5% by 2030 make a great reduction in energy consumption and GHG emissions.

Strides in Alternative Fuels

Government has also made great efforts in the direction of adopting alternative fuels and energy sources. Incentivization of EV vehicles through FAME I & II schemes resulted into eleven-fold jump in the EVs in just last 5 years. Though there are still concerns like range anxiety among customers, lack of capability in battery production and conventional coal-based energy sources as power sources as per experts but with time, affirmative policy actions will overcome the challenges of reliability and domestic production of parts. With steep increment of solar, power and other renewable power production, the share of conventional sources will be decreased making EVs more sustainable. Meanwhile government has also seemed determined to make India capital of green hydrogen production with its national green hydrogen policy. The efforts have also resulted into success of adopting 20% ethanol blending before targeted timeline is a proof of India's collective determination.

Conclusion

The holistic approach of decarbonization of transport sector will not only help in contribute to economic growth through efficient freight and logistics but also help in reducing demand of importing fossil fuels. These efforts of modal shift, alternative fuels, development of public transport with efficient planning tools will help in improving air quality, reducing GHG emissions. The better air quality (better health and productivity, reducing premature death, impact on industries and other sectors) can help in saving up to 95 to 150 USD per annum in India apart from reduced import bills.

Powering Industry, Empowering India: How Modi's Energy Reforms Secure Growth and Green Jobs

Adhitya Bharadwaj and Girish M S
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At the present juncture of the nation's economic growth, industrial energy security cannot be a peripheral concern for India. Rather, it is the foundational pillar upon which the nation's economic aspirations, national security, and strategic autonomy are built. The uninterrupted availability of affordable and reliable energy is the critical input that fuels industrial activity, drives urbanisation, and supports the rising living standards of over a billion people.

Under the visionary leadership of Prime Minister Narendra Modi, the country has taken historic steps to ensure a strong future for India’s energy sector. India's energy demand is on track to outpace all other regions of the world by 2050, positioning it as the single largest source of global energy demand growth over the next two decades. Besides expanding the scope of economic growth, under Prime Minister Shri Narendra Modi, India is leading one of the world's largest and most inclusive clean energy transitions.

This transformative project prioritises the workforce, equity, and rural development, going beyond mere megawatts or climate targets. This article aims to explain various aspects of India’s scenario regarding the energy sector, with particular focus on industrial security and employment.

Industrial Security

It is important to mention that the industrial sector is the largest consumer of electricity in the nation, accounting for 42% of the total demand. For key heavy industries such as steel, cement, aluminum, and petrochemicals, which form the bedrock of the manufacturing economy, energy is not just an operational cost but a crucial raw material. Any disruption in its supply can have cascading effects, crippling production, disrupting supply chains, and undermining economic stability.

The immense scale of India's energy demand and its deep-seated import vulnerabilities are further complicated by the global imperative of climate change. This places Indian policymakers at the nexus of a formidable strategic challenge known as the "energy trilemma": the need to simultaneously ensure energy security, energy affordability, and environmental sustainability. Successfully navigating this trilemma is the defining goal of India's contemporary energy policy.

The Government, under the leadership of Prime Minister Shri Narendra Modi Ji, has articulated a dual-pronged approach to meet this challenge. On the one hand, it has decided to pursue a policy to ensure a stable and affordable supply of conventional energy to power its immediate industrial and developmental needs. On the other hand, it is pursuing one of the world's most ambitious energy transition programs, with a commitment to achieve 500 GW of non-fossil fuel-based energy capacity by 2030 and reach Net Zero emissions by 2070.

While the Central Government sets the national strategy, the states set the stage for policy innovation and implementation. Industrial leaders Gujarat and Maharashtra are at the forefront of renewable adoption. Gujarat's Renewable Energy Policy 2023 is highly attractive to industries, offering key incentives such as waiving cross-subsidy surcharges and additional surcharges for captive power projects, and removing capacity restrictions. Maharashtra has pioneered new fuel sources with its comprehensive Green Hydrogen Policy 2023, which provides a robust suite of incentives, including significant capital subsidies and exemptions on electricity duty and wheeling charges, to attract investment.

A critical and accelerating trend in India's industrial energy landscape is the move towards self-generation through Captive Power Plants (CPPs). This strategic pivot by industries is not a matter of choice but a necessity, driven primarily by the often unreliable, poor-quality power supplied by state-owned distribution companies (DISCOMs) and the comparatively high industrial tariffs they impose. As of fiscal year 2022-23, the installed capacity of CPPs stood at a substantial 78.4 GW, underscoring their critical role in ensuring operational continuity for the Indian industry. The legal framework for this trend is anchored in the landmark Electricity Act, 2003, which was passed under the leadership of former Prime Minister Shri Atal Behari Vajpayee, and the subsequent Electricity Rules, 2005.

These regulations de-licensed the establishment of CPPs, stipulating that a power project is considered 'captive' if the consuming entity uses at least 51% of the power generated and holds a minimum of 26% of the equity in the plant. This liberalized framework has empowered power-intensive industries like steel, aluminum, and cement to take control of their energy supply, often setting up coal-based plants

for baseload power or bagasse-based cogeneration plants in the case of sugar industries.

More recently, under the leadership of Prime Minister Shri Narendra Modi Ji, this landscape has been revolutionised by the falling costs of renewable energy and the introduction of the Green Energy Open Access Rules in 2022. This has created a vibrant market for industries to procure cheaper and cleaner power directly from renewable energy generators or to set up their own renewable CPPs. This presents a profitable opportunity estimated at over 20 GW for the steel, cement, and aluminium sectors alone. By replacing expensive grid power with more affordable open-access solar power, some electric arc furnace-based steelmakers can slash their production costs by as much as 10%. 2

Green Employment

"Since 2014, India has increased its solar installation capacity by 30 times. We want to make every household in India a solar-powered home. From houses to roads, India has moved on the path of energy-efficient lighting. Through all these efforts, green jobs are being created in very large numbers. The India of the 21st century is moving ahead with education, skill, research and innovation." — PM Shri Narendra Modi.

Since 2014, India has increased its solar installation capacity by 30 times. We want to make every household in India a solar-powered home. From houses to roads, India has moved on the path of energy-efficient lighting. Through all these efforts, green jobs are being created in very large numbers. The India of the 21st century is moving ahead with education, skill, research and innovation."

— PM Shri Narendra Modi.

India's green sector is witnessing explosive expansion, with 7.29 million new green jobs projected by FY28 and 35 million by 2047, according to NLB Services (2025). Dynamic investments in renewables, electric vehicles, sustainable infrastructure, waste management, and climate-resilient construction drive the growth. By 2025, the renewable energy sector alone accounted for over 1.02 million jobs nationwide, as per the International Renewable Energy Agency (IRENA), cementing India's position as a global leader in clean energy employment. The solar industry is at the forefront, accounting for the largest share, followed by wind (52,200 jobs in 2023). Other fast-growing roles are emerging in bioenergy, solar heating/cooling, and new segments such as battery storage and digital grid operations.

Some of the notable points showcasing progress in this context are as follows:

- a. Over 167,000 workers have been reskilled in solar and clean energy segments by the Skill Council for Green Jobs (SCGJ) as of FY2025, with specialized programs for wind, hydrogen, and mini-hydro. Premium upskilling programs like "Suryamitra" have trained over 51,500 solar PV technicians since 2015, supported by strong curriculum upgrades and placement partnerships with industry leaders. Coal-dominant states like Jharkhand, Chhattisgarh, and Madhya Pradesh are piloting district-level transition plans, including digital mapping of skill gaps, early retraining, and creative rural enterprise schemes. Recent studies show that 70% of surveyed coal workers are open to sectoral shifts with appropriate transition support and opportunities.
- b. Under the PM-KUSUM scheme, over 10 lakh (one million) solar pumps have been installed/solarised by FY2025, transforming both agriculture and local energy economies. The scheme's direct and indirect job generation is substantial. PM-KUSUM creates approximately 24.5 job-years per installed MW of decentralised solar, translating to hundreds of thousands of jobs for skilled and unskilled workers, especially in underserved agrarian districts.

- **c.** The National Green Hydrogen Mission, launched with a budget of ₹19,744 crore (approx. $2.4 billion), aims to make India a global hub for green hydrogen production, use, and export. The Mission is set to create over 6 lakh (600,000) high-quality green jobs by 2030, including roles in advanced manufacturing, infrastructure, project development, research, logistics, and engineering.
- **d.** The government has embedded green skills in the National Education Policy (2020) and catalysed public-private partnerships, digital skilling initiatives, and rural entrepreneurship to future-proof the workforce.
- **e.** India's distributed renewable energy (DRE) push, with especially flagship schemes like PM Surya Ghar: Muft Bijli Yojana, is democratizing energy access while catalysing local jobs. The ambitious goal: 1 crore (10 million) rooftop solar installations for households by 2027, with Rajasthan, Gujarat, Karnataka, and Tamil Nadu leading in capacity. Local employment surges as installations, maintenance, and micro-grid management become mass professions.
- **f.** A notable aspect of the changes in the government's policies is putting women at the center of India's energy revolution. From entrepreneur networks like Solar Charkha Mission, to micro-enterprises using productive-use solar appliances in farming, textiles, and food processing, the clean energy sector is empowering women to earn, lead, and innovate at scale. Women's share of DRE employment exceeds 80% in several states, reflecting the inclusive design of off-grid, mini-grid, and solar appliance programs. These models are now being showcased globally as best practice for linking electrification and gender empowerment.

Clean Fuels, Secure Future: India's Green Hydrogen Vision under the Modi Government

Dr. Parikshit Kumar Rajput
Post-Doctoral Researcher,
IIT Madras

The world is rapidly shifting to clean energy to fight climate change and reduce reliance on fossil fuels. Hydrogen has emerged as a key next-generation fuel. It is classified based on how it is produced and its emissions: gray from fossil fuels (high CO_2), blue from fossil fuels with carbon capture, green from renewable energy, and others like turquoise, pink, and yellow from emerging or nuclear-powered methods. Among these, green hydrogen is made using clean energy such as solar or wind, producing no pollution. It can reduce emissions, enhance energy security, and create new job opportunities.

India has recognized its importance and launched the National Hydrogen Mission to make the country a global hub for green hydrogen production and exports. The Ministry of New and Renewable Energy (MNRE) organized India's first Green Hydrogen R&D Conference, where startups and industries showcased their latest work in production, storage, safety, and use of AI and ML in green hydrogen. The discussions emphasized the importance of collaboration between academic institutions and industry to achieve national green hydrogen goals. With abundant resources available, India is well-positioned to produce green hydrogen, and the current conditions are highly favorable.

Building on this, the Green Hydrogen technologies being developed in India should span the entire value chain to ensure a sustainable and scalable ecosystem:

1. Electrolyser Efficiency & Cost Reduction: Improving performance and reducing costs of electrolysers to make green hydrogen competitive.
2. Alternative Production Technologies: Exploring biomass, photoelectrochemical, and other emerging methods alongside conventional electrolysis.
3. Storage Solutions: Developing safe and efficient storage options, including ammonia, compressed hydrogen, and cryogenic methods.
4. Infrastructure Development: Expanding pipelines, retrofitting existing facilities, and establishing ports for hydrogen transport and distribution.
5. End-Use Innovation: Integrating green hydrogen into steel, fertilizer, mobility, and power sectors to maximize decarbonization impact.
6. Safety, Standards & Certifications: Ensuring robust safety protocols, standards, and certifications across production, storage, and transport.
7. Recycling & Circularity: Promoting recycling of critical materials and circular approaches for electrolyser and catalyst components.
8. Software & System Integration: Leveraging digital twins and advanced software for efficient system management, monitoring, and optimization.

Right now, most green hydrogen production focuses on electrolyzers, which use electricity from renewable sources to split water into hydrogen and oxygen. But India also has a huge number of biomass-crop residues, organic waste, and other natural materials. Instead of letting this go to waste, it can be converted into hydrogen, making biomass-to-hydrogen a promising and sustainable alternative pathway.

India is moving beyond research and stepping firmly into commercial deployment of green hydrogen. In a major breakthrough, Jakson Green set a record in August 2025 by ₹50.75/kg for green ammonia under the National Green Hydrogen Mission's SIGHT Scheme. Even lower prices down to ₹49.80/kg by the Solar Energy Corporation of India (SECI). Green hydrogen and its derivatives are no longer just a clean energy dream but are fast becoming economically competitive. This achievement showcases India's readiness to scale up and bring hydrogen into mainstream industrial and energy applications.

The transition to a green hydrogen economy needs both state support and industry involvement. Several states are taking action: Gujarat and Maharashtra are developing hydrogen hubs linked to industrial clusters, Kerala is testing hydrogen-powered buses, and Ladakh is producing green hydrogen using solar energy. Industry participation is equally important. Companies like Reliance, Adani, NTPC, and Indian Oil are investing heavily in hydrogen production, while collaborations with global firms help share technology, reduce costs, and build infrastructure. Small-scale pilot projects in transport, refineries, and steel plants provide real-world data, highlight challenges, and pave the way for larger-scale deployments.

Green hydrogen is at the heart of the global energy transition. For India, it offers a path to decarbonize hard-to-abate industries, strengthen energy security, reduce imports, and unlock export opportunities. The combined push from the National Hydrogen Mission, state initiatives, industry participation, and pilot projects is creating a clear roadmap for the future.

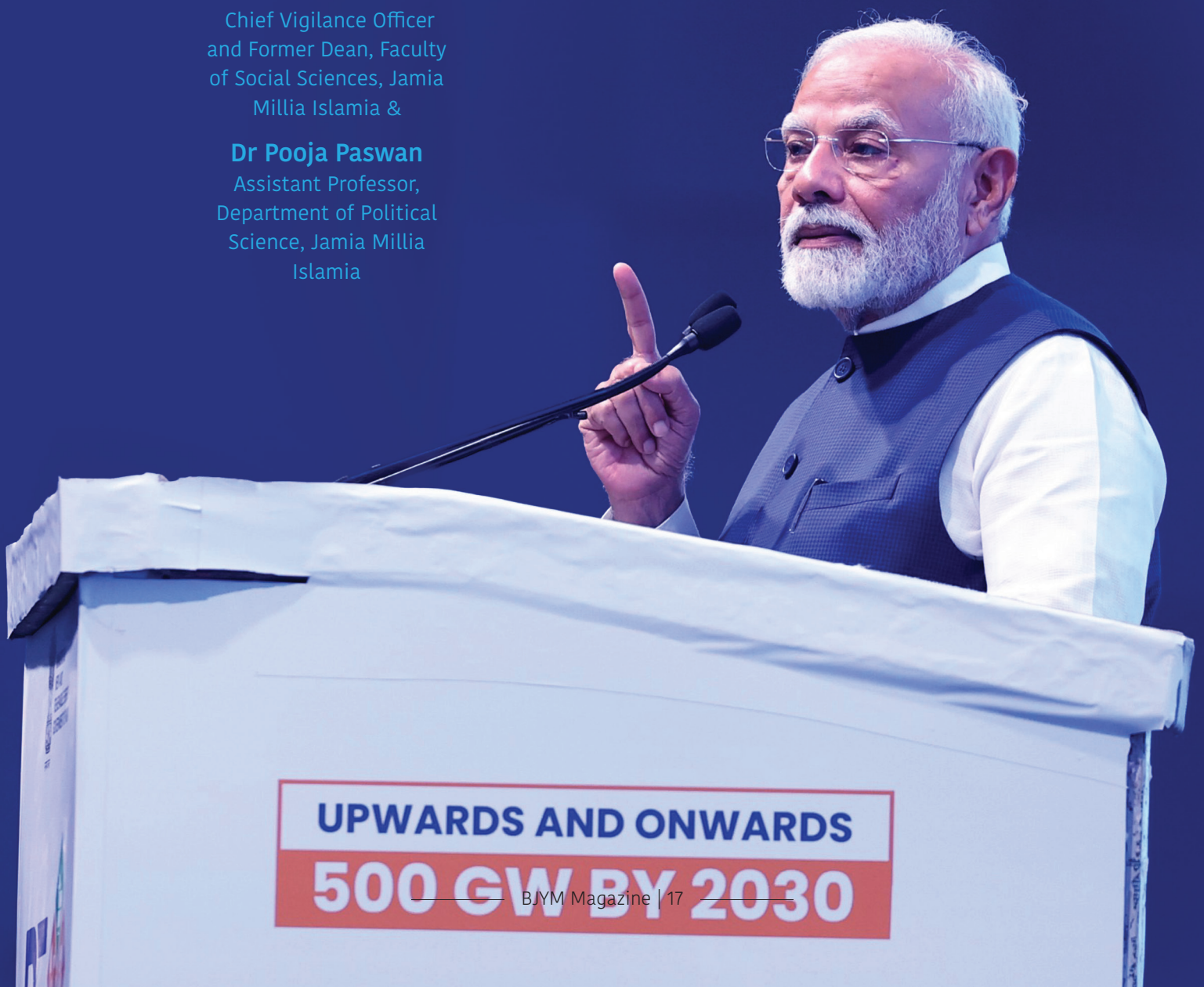
By investing today in green hydrogen and clean fuels, India has the chance to build a sustainable, competitive, and energy-secure future. The road ahead is challenging, but it is also essential and promises a cleaner, more prosperous tomorrow.

From Scarcity to Surplus: How Modi's Vision Rewired India's Energy Destiny

Energy is not just about fulfilling our needs; it is also a key driver of our economic progress and a symbol of our self-reliance."
– PM Narendra Modi

Prof Ravinder Kumar
Chief Vigilance Officer and Former Dean, Faculty of Social Sciences, Jamia Millia Islamia &

Dr Pooja Paswan
Assistant Professor, Department of Political Science, Jamia Millia Islamia



Energy is not just about lighting homes or fuelling industries; it is the very backbone of a nation's sovereignty, progress, and dignity. It powers agriculture, drives mobility, fuels economic growth, and upholds a dignified standard of living for every citizen. In a country as vast and aspirational as India, energy security is not merely about the availability of electricity or fuel; it is a strategic imperative tied to national strength, social justice, and sustainable development.

Under the visionary leadership of Prime Minister Shri Narendra Modi, India has undergone a transformative shift in its energy landscape over the past decade. With a forward-looking, integrated strategy that bridges conventional energy sources with cutting-edge renewable technologies, the government has taken decisive steps to make India energy-secure, self-reliant, and future-ready. This approach is not just about meeting current demand; it's about shaping a resilient and inclusive energy future for generations to come.

Empowering Citizens Through Energy Justice

Under the visionary leadership of Prime Minister Narendra Modi, energy justice has become central to India's development journey. Landmark initiatives like the Pradhan Mantri Ujjwala Yojana (PMUY) have empowered over 9 crore women with clean LPG connections, replacing hazardous smoky chulhas. Simultaneously, the Saubhagya Yojana electrified 2.82 crore households, ensuring near-universal access to power. These interventions have transformed health outcomes, restored dignity, and uplifted the aspirations of millions. As PM Modi aptly said, "Smoke-free kitchens are not just about health; they are about dignity and empowerment of our mothers and sisters." India's energy vision is deeply rooted in social equity, where clean and accessible power becomes a right, not a privilege.

Building a Future-Ready, Green Energy Nation

India is rapidly transitioning from fossil dependency to a diversified, sustainable energy portfolio. With solar and windmaking India the 3rd largest renewable energy market globally, and a 500 GW non-fossil target by 2030, the nation is leading the green revolution. Strategic policies like ethanol blending (20% by 2025) and expansion of hydro and nuclear capacity strengthen domestic supply and reduce vulnerability to global shocks. India has fortified energy security through strategic petroleum reserves, commercial coal liberalisation, and digital grid modernisation. Green initiatives like the International Solar Alliance, the National Hydrogen Mission, and electric mobility (FAME India) demonstrate a bold commitment to sustainable growth. As PM Modi said, "India will achieve net zero emissions by 2070. This is not just a promise, this is a roadmap for sustainable development."

India has deepened strategic ties with nations such as the UAE, the USA, Japan, and Australia, while championing multilateral platforms such as the G20 Energy Transition Working Group. Initiatives like ross borders.

A Decade of Energy Security: India's Power Shift under PM Modi (2014–2025)

Over the past decade, India's energy sector has undergone a transformational shift, marking a decisive move toward energy security, inclusion, and sustainability. Beginning in 2014 with the revolutionary UJALA scheme, which brought energy-efficient LED lighting to millions of homes, the government followed with landmark initiatives such as the Ujjwala Yojana (2016), providing over 9 crore LPG connections to empower rural women. The Saubhagya Yojana (2017) further electrified 2.82 crore households, bringing near-universal electricity access. By 2019, India had become the third-largest renewable energy producer globally, and in 2021, the National Hydrogen Mission and the Net Zero pledge (2070) were announced. With ethanol blending reaching 12% in 2023, India is on track to achieve 20% by 2025, signalling remarkable strides in biofuels and green alternatives.

Diversifying the Energy Mix: From Fossil Reliance to Clean Innovation

India's energy portfolio has diversified significantly.

In 2014, the mix was heavily skewed toward fossil fuels: 60% coal, 25% oil & gas, and only 7% renewables. By 2023, thanks to massive investment and policy innovation, renewables accounted for 43% of installed capacity, while coal's share fell to around 50%. The target for 2030 envisions a dramatic leap: 500 GW of non-fossil capacity, forming 65–70% of the mix, while fossil fuels drop to 30–35%, and emerging sources like green hydrogen and storage begin to play a key role. This transformation is both an environmental imperative and a strategic push toward Atmanirbharta (self-reliance). The government's blend of innovation, infrastructure investment, and global diplomacy positions India as a future-ready green powerhouse.

Impact at a Glance: Milestones, Maps, and India's Energy Hotspots

India's energy revolution is best captured in numbers and on the ground. Over 36 crore LED bulbs have been distributed, reducing emissions and household bills. Strategic Petroleum Reserves have been created in Visakhapatnam, Mangalore, and Padur, shielding India from global price shocks. The FAME India mission has catalysed EV infrastructure across major cities, while India's international commitments like the International Solar Alliance and One Sun, One World, One Grid (OSOWOG) project have global ambition. Regionally, Rajasthan and Gujarat lead in solar energy, Tamil Nadu and Karnataka in wind, the Himalayas and Northeast in hydropower, and Andhra Pradesh and Karnataka host oil reserves. Uttar Pradesh and Maharashtra are emerging as biofuel hubs. These hotspots illustrate a nationwide energy renaissance, with every corner of the country contributing to India's clean, inclusive, and secure energy future.

FutureReady India on the Global Stage

Energy diplomacy is now a cornerstone of India's foreign policy. Under PM Modi's leadership, India has deepened strategic ties with nations such as the UAE, the USA, Japan, and Australia, while championing multilateral platforms such as the G20 Energy Transition Working Group. Initiatives like "One Sun, One World, One Grid" (OSOWOG) envision a solar-powered planet with shared energy across borders. India is also collaborating internationally to develop energy hubs in its neighbourhood, such as the India-UAE agreement to develop an energy hub in Sri Lanka's Trincomalee. It is exploring joint R&D and investment partnerships with countries such as Canada in clean energy technology.

Looking ahead, India is charging toward 500GW of renewable capacity by 2030, net zero by 2070, and becoming a global hub for EVs, batteries, and green hydrogen. Key recent moves include major investments in battery gigafactories—such as the one announced by the Tata Group, strengthening EV policy to increase EV adoption, and expanding its green hydrogen ecosystem through state-level policies with incentives, such as interstate transmission charge waivers. Additionally, India is making strides in nuclear expansion, for example, through agreements with EDF and Rosatom to build large nuclear power reactors in Maharashtra under more favourable, collaborative terms.

These developments show that India's energy roadmap isn't just aspirational, it's grounded in real policy, investment, and global cooperation. The fusion of Atmanirbharta (self-reliance) with global leadership is becoming tangible across clean energy, EVs, hydrogen, nuclear energy, and energy diplomacy, putting India firmly in the circle of nations shaping the next era of global energy transitions.

Partnerships Power Progress

India's journey towards energy sovereignty is built on strong partnerships across the board. State governments are rolling out solar parks and biofuel innovations tailored to local needs. Industries are leading breakthroughs in electric vehicles, renewable solutions, and battery manufacturing. Meanwhile, research institutions are driving forward carbon capture technologies and advanced nuclear energy systems. As PM Modi affirms, "The strength of our federal system lies in the partnership between the Centre and the states. Together we can make India an energy powerhouse." These partnerships are key to building a resilient, decentralised, and innovation-driven energy future.

Smart Meters, Bright Future: Building Energy Security through Efficiency and Innovation

Tejashwini V
Policy Consultant at Nation First Policy Research Centre

India's journey towards energy security is multifaceted, extending beyond simply generating more power. While augmenting our clean energy capacity is crucial, the strength of our energy ecosystem lies also in how we manage and consume it. Under the visionary leadership of Prime Minister Shri Narendra Modi, a quiet but profound revolution is underway, focusing on energy efficiency and demand management. This paradigm shift is central to our national mission of creating a resilient, sustainable, and self-reliant energy future. It is a strategic approach that turns conservation into a powerful tool for economic growth and environmental stewardship.

BEE, Standards and Labelling - The Bedrock of Efficiency

At the heart of India's energy efficiency drive is the Bureau of Energy Efficiency (BEE). Established under the Energy Conservation Act, 2001, BEE is the nodal agency for promoting energy efficiency across all sectors. The BEE's most visible and impactful program is the Standards & Labelling (S&L) program. This initiative mandates that household appliances like refrigerators, air conditioners and light bulbs carry a star rating, from 1-star (least efficient) to 5-star (most efficient). This simple, yet powerful system empowers consumers to make informed choices, driving the market towards more energy-efficient products.

The impact of this program has been phenomenal. By the end of 2022-23, the S&L program is estimated to have achieved an energy saving of 171.74 Billion Units (BU), leading to a monetary saving of ₹ 1,26,464 crore. This has also led to a significant reduction in CO_2 emissions, contributing positively to our climate goals. The program has been expanded to cover a wide range of appliances, including LED bulbs and washing machines, and has become a global model for promoting energy conservation at the household level. The Modi government's push for widespread adoption of LED lighting under the Unnat Jyoti by Affordable LEDs for ALL (UJALA) scheme is a testament to this commitment. This initiative alone has distributed over 368 million LED bulbs, saving approximately 48.47 BU of electricity annually.

PAT Cycles - A Revolution in Industrial Efficiency

The Perform, Achieve and Trade (PAT) scheme is another flagship initiative that has transformed energy consumption in the industrial sector. Launched in 2012, the PAt scheme operates on a market-based mechanism to enhance energy efficiency in energy-intensive industries. Under this scheme, designated consumers (DCs) from various sectors are given specific energy-saving targets. If a DC surpasses its target, it can trade its 'energy savings certificates' (ESCerts) with other DCs who fail to meet their targets.

The success of the PAT scheme has been remarkable! The first three PAT cycles alone (PAT I, II and III) saved 25.26 Million Tons of Oil Equivalent (MTOE), which is equivalent to avoiding the use of over 31 million tonnes of coal. During the year 2022-23, the above units under PAT have saved 25.77 Million Ton of Oil Equivalent (MTOE), which is about 8% of their total annual energy consumption. This has not only reduced the energy costs for these industries but also significantly lowered the carbon footprint. The Modi government has expanded the PAT scheme to include more sectors and industries, further amplifying its impact. The introduction of PAT cycle VI (2022-23 to 2024-25) includes new sectors like commercial buildings, signalling a broader and more ambitious vision for industrial energy efficiency.

Municipal Energy Efficiency Projects: Powering Urban India

Urban India is a massive consumer of energy, and municipal bodies play a vital role in meeting this demand. The Modi government, through schemes like the Smart Cities Mission, has been actively promoting energy efficiency in urban infrastructure. One of the key areas is street lighting. The installation of LED streetlights has emerged as a game-changer through the nationwide Street Lighting National Programme (SLNP), which has replaced over 12 million conventional streetlights with LEDs. These lights are not only more energy efficient but also have a longer lifespan, which has led to an estimated energy saving of 8.63 BU annually and has resulted in a reduction of 6 million tonnes of CO_2 emissions.

The project is not just about replacing bulbs, it is about creating a smart, sustainable and energy efficient urban infrastructure. Additionally, municipalities are being encouraged to adopt energy-efficient pumps for water supply and to implement waste-to-energy projects, creating a circular economy model.

Demand-Side Management & Smart Technology - The Future is Here

While energy efficiency focuses on reducing the energy consumed by devices, Demand-Side Management (DSM) aims to influence the timing and pattern of energy use. The integration of smart technology is the cornerstone of this strategy. Time-of-Day (ToD) pricing is a key DSM tool. Under this system, electricity rates vary depending on the

time of the day, with higher rates during peak hours and lower rates during off-peak hours. This incentivises industries and households to shift their energy-intensive activities to off-peak hours where possible, thereby reducing the strain on the grid during high-demand periods.

The Modi government, through schemes like the Smart Cities Mission, has been actively promoting energy efficiency in urban infrastructure.

The introduction of smart meters is vital for ToD pricing. These meters provide real-time consumption data, enabling both the consumers and power utilities to better manage energy use. The Modi government's push for the installation of 250 million smart meters by 2025 is a massive step towards building a modern, responsive energy grid. Smart appliances and smart home systems are also becoming increasingly popular in households and industries. These devices, which can be remotely controlled and programmed, allow for precise energy management. For instance, an air conditioner can be programmed to cool a room just before a person arrives, or an industrial furnace can be scheduled to operate during off-peak hours. The government's promotion of energy-efficient appliances and the development of a robust digital infrastructure are key to unlocking the full potential of DSM.

Forging a New Path to Energy Independence

The strategic focus on energy efficiency and demand management represents a fundamental shift in India's energy philosophy which is intrinsically linked to our nation's broader push for cooperative federalism, where the Centre provides a robust policy framework and states act as crucial implementation partners. The success of projects like the SLNP in urban centers demonstrates how national programs can be effectively tailored to local contexts.

Furthermore, this focus is a direct response to global energy transition. By optimising our current energy consumption, we make it easier to integrate the massive influx of renewable energy capacity, especially from the intermittent sources like solar and wind. Smart grid technologies and DSM are the critical enablers of this transition, ensuring grid stability as we move away from conventional, fossil-fuel-based generation. The push for smart meters isn't just about billing accuracy but about creating a two-way flow of information that will revolutionise how energy is produced, distributed and consumed.

In essence, energy efficiency and demand management, beyond being tools for saving power, are also powerful instruments for achieving energy justice and ensuring sustainable growth. They help reduce the financial burden on consumers, particularly those with lower incomes, and promote cleaner air by reducing the need for new power plants. This holistic approach ensures that as India powers its way to a $ 5 trillion economy, it does so with a resilient, environmentally conscious energy ecosystem, creating a new and enduring pathway to true energy security.

Himalayan Hydrogen: Himachal's Role in India's Clean Energy Revolution

Shrey Awasthi
Co-convenor Social Media,
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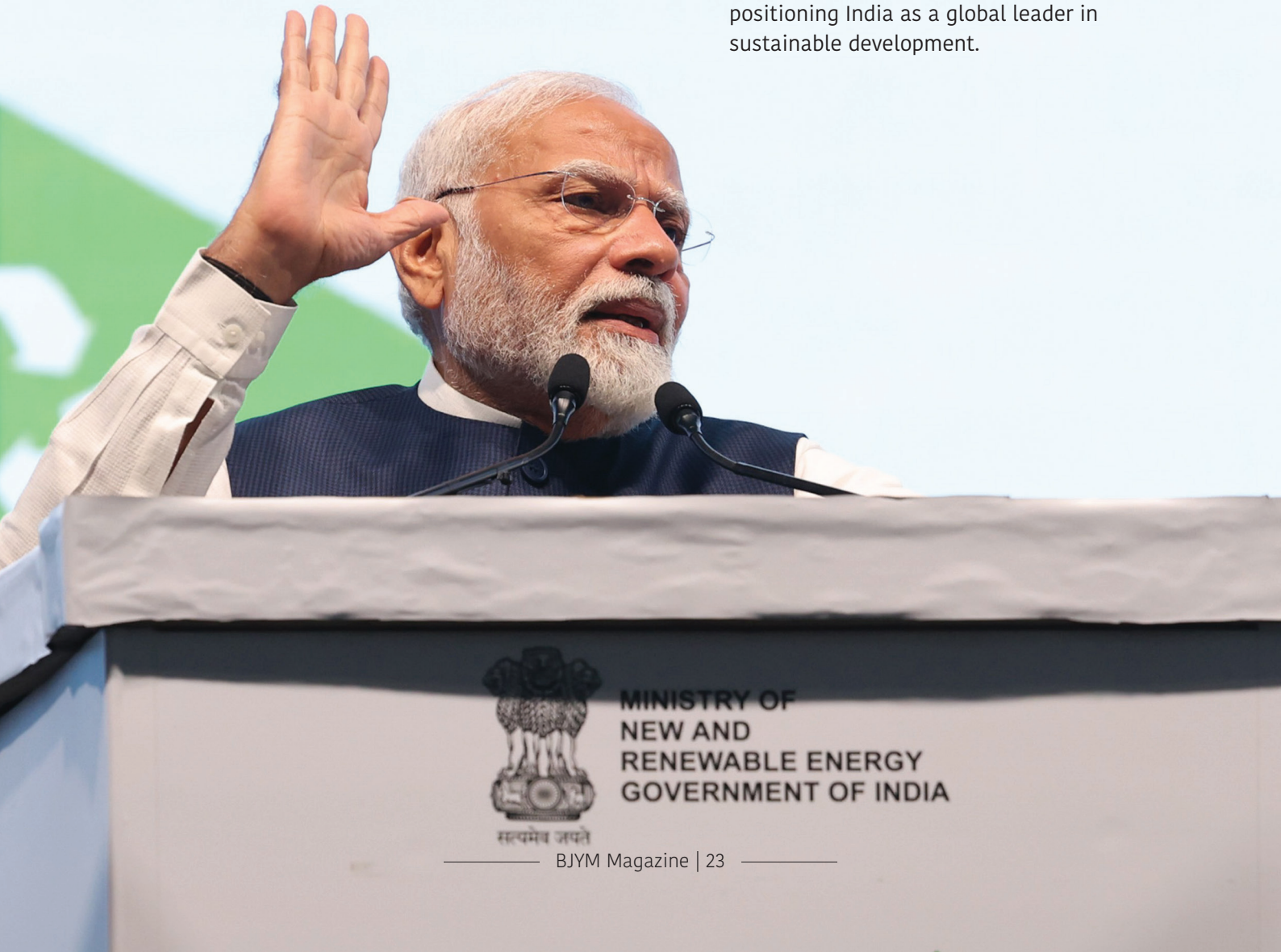
Energy is not merely about electricity; it is about powering the aspirations of a billion-plus Indians, fuelling industries, and ensuring national security. Under the dynamic leadership of Prime Minister Shri Narendra Modi, India has transformed its approach to energy security over the past decade. What was once considered a vulnerability, our heavy reliance on imports, has become a strategic opportunity through diversification, innovation, and bold reforms.

From strengthening domestic fuel supplies and strategic reserves to advancing renewable energy, green hydrogen, and resilient grids, India today stands at the forefront of the global clean energy transition. This vision is not only about meeting the country's energy needs but also about positioning India as a global leader in sustainable development.



Diversifying India's Energy Mix

In 2014, India faced the dual challenge of rising demand and high import dependence. Prime Minister Modi's

government responded with a comprehensive energy diversification plan:

- **Boosting Domestic Production:** Coal block auctions, reforms in oil & gas exploration, and easing of policies have increased domestic production capacities.
- **Strategic Petroleum Reserves:** India created buffer stock facilities in Visakhapatnam, Mangalore, and Padur to cushion against global oil supply disruptions.
- **Ethanol Blending:** Ethanol blending in petrol has risen from 1.5% in 2014 to more than 12% today, reducing emissions and import bills.
- **Renewables Expansion:** India is now the fourth-largest renewable energy producer with solar, wind, biomass, and hydropower at the core.
- **International Solar Alliance (ISA)**: Spearheaded by PM Modi, ISA has made India a global clean energy leader, forging south-south cooperation.

Clean Fuels and the Green Hydrogen Revolution

The most visionary initiative has been the National Green Hydrogen Mission, launched with a target of producing 5 million tonnes of green hydrogen annually by 2030. This mission places India on the path to industrial decarbonisation, clean transport, and export competitiveness.

Key Opportunities in Green Hydrogen:

- **Industrial Decarbonisation:** Industries like steel, fertiliser, and oil refining—responsible for nearly 40% of industrial CO_2 emissions—are preparing to switch to hydrogen-based production. For example, NTPC is piloting green hydrogen blending in pipelines and experimenting with hydrogen use in steelmaking.
- **Transport Revolution:** Hydrogen-powered buses and trucks are being tested. In Ladakh, India's first green hydrogen mobility project with fuel-cell buses was launched in 2023, proving the feasibility in challenging terrains.
- **Green Ammonia & Fertiliser:** India's fertiliser sector is heavily import-dependent. Green ammonia projects, like the one started in Gujarat, demonstrate how fertilisers can be produced sustainably.
- **Global Hub Potential:** With abundant renewable resources, India aims to become a net exporter of green hydrogen, supplying Europe, Japan, and South Korea.

These are not distant dreams—pilot projects are already operational, and the momentum is unstoppable.

Building Resilient Grids and Technological Leadership

Energy security also means building resilient and innovative infrastructure that can handle the growing renewable load. Under PM Modi's leadership:

- **Smart Metering & Digital Grids:** Millions of smart meters have been installed to cut losses and improve efficiency.
- **One Nation, One Grid:** Seamless transmission networks now allow renewable energy produced in Rajasthan or Tamil Nadu to power homes in Delhi or Mumbai.
- **Energy Storage:** India has launched pumped hydro storage projects and is piloting large-scale battery energy storage systems (BESS).
- **Biofuels Push:** The launch of India's Global Biofuel Alliance at G20 2023 demonstrates PM Modi's global leadership in clean fuels.

These measures not only strengthen energy reliability but also create future-proof systems that will make India a model for developing nations.

Himachal Pradesh: A Rising Star in India's Clean Energy Journey

While national policies set the vision, it is the states that implement and innovate. Himachal Pradesh, blessed with rivers, mountains, and a young, aspirational population, has unique opportunities to contribute to India's green energy revolution.

1. Hydropower as the Foundation for Green Hydrogen

Himachal already generates 13,000+ MW of hydropower and exports electricity to other states. This surplus power, particularly during non-peak hours, can be redirected to electrolysers for green hydrogen production. The model is simple: use water + electricity to generate hydrogen, store it, and supply it to industries.

Just as Ladakh launched hydrogen buses, Shimla and Manali can be pilot cities for hydrogen mobility, creating eco-friendly transport corridors.

2. Green Ammonia and Fertilisers

With apple farming, horticulture, and agriculture central to Himachal's economy, local green fertiliser plants can be set up using green hydrogen. This will:

- Reduce farmers' dependence on imported urea.
- Create jobs in local fertiliser units.
- Establish Himachal as a self-reliant agricultural hub.

3. Decarbonising Cement Industry

Himachal hosts major cement plants in Solan, Bilaspur, and Chamba. These plants can pioneer hydrogen-based heating to replace coal in clinker production. If implemented, Himachal could become India's first green cement hub—boosting exports and reputation.

4. Tourism and Zero-Emission Mobility

Tourism contributes nearly 7% to Himachal's GDP. Hydrogen-based buses, taxis, and ropeways can make the state the first "green tourism destination" in India. Imagine eco-friendly buses in Dharamshala, Kullu, and Kangra powered entirely by Himachal's own hydrogen!

5. Waste-to-Energy Opportunities

Biomass from apple residues, pine needles (a forest hazard), and agricultural waste can be converted into bio-CNG or hydrogen. This not only generates energy but also helps protect forests from fire hazards.

6. Academia and Start-up Ecosystem

With institutions like IIT Mandi, NIT Hamirpur, and CSIR labs, Himachal can establish hydrogen innovation centres. Start-ups led by youth can develop technologies in:

- Small-scale electrolysers for villages.
- Hydrogen storage and distribution.
- Hybrid microgrids for remote tribal areas (Lahaul-Spiti, Pangi).

Such initiatives would align perfectly with PM Modi's Start-Up India and Skill India missions.

Real-World Success Stories India Can Replicate in Himachal

- **Ladakh Hydrogen Bus Pilot (2023):** NTPC launched fuel-cell buses powered by hydrogen in Leh, proving that high-altitude clean transport is feasible. Himachal can replicate

- this in Shimla and Manali.
- **Ethanol Success in Uttar Pradesh**: Farmers in UP now sell sugarcane for ethanol, creating income security. Himachal's apple farmers can similarly supply residues for bio-energy projects.
- **Green Ammonia in Gujarat:** Projects in Kandla and Hazira are producing green ammonia for fertilisers, a model Himachal can adopt on a smaller scale.
- **Smart Grid in Kerala:** Kerala has implemented AI-driven grid management systems to integrate renewables. Himachal can use similar systems for hydropower balancing alongside hydrogen projects.

Politically Attractive Vision

Prime Minister Narendra Modi's vision of energy Atmanirbharta is not just about technology—it is about empowering people. For Himachal Pradesh, aligning with this mission means:

- **Green Jobs:** Thousands of opportunities for youth in hydrogen plants, clean transport, and bio-energy projects.
- **Tourism Boost:** Zero-emission transport enhances Himachal's brand as an eco-tourism state.
- **Agriculture Security:** Locally produced fertilisers reduce farmers' costs.
- **National Leadership:** Himachal can position itself as the "Hydrogen State of the Himalayas."

This is politically attractive because it speaks directly to employment, sustainability, and regional pride, all under PM Modi's transformative policies.

Conclusion

Energy security is both a national necessity and a global responsibility. Under Prime Minister Narendra Modi's leadership, India has transformed from an energy-dependent nation into a global torchbearer of clean fuels and innovation.

For Himachal Pradesh, this is the moment to rise. With its hydropower strength, natural resources, and vibrant youth, Himachal can lead the hydrogen revolution in the Himalayas—just as Gujarat leads solar, and Ladakh leads pilot hydrogen projects.

The future is clear: Energy Atmanirbharta + Green Innovation = Stronger India, Stronger Himachal. And in this journey, Prime Minister Modi's leadership ensures that every citizen—from the farmer in Kangra to the tourist in Manali—benefits from a reliable, affordable, and sustainable energy future.

Made in India, Powering the World: Modi's Drive for Energy Independence through Innovation

Vikas Dhar, Co-Founder, LivWell

Under the visionary leadership of Prime Minister Shri Narendra Modi, India has transformed its energy landscape, placing energy security at the heart of national sovereignty and sustainable growth. Over the past decade, the Modi government's "Atmanirbhar Bharat" initiative has not only diversified the energy mix but also fortified domestic capabilities through cutting-edge technology, robust research and development (R&D), and indigenous manufacturing. This strategic push ensures reliable, affordable, and green energy for 1.4 billion citizens and burgeoning industries, reduces import dependencies, and positions India as a global leader in clean energy transitions.

The focus on technology, R&D, and indigenous manufacturing exemplifies this approach. From solar cells to wind components, batteries, and electrolysers, the government has leveraged Production Linked Incentive (PLI) schemes, the National Green Hydrogen Mission (NGHM), and collaborative ecosystems to build self-reliance. These efforts, in partnership with progressive states, industry giants, and academia, are creating jobs, fostering innovation, and driving exports. As India races toward its 500 GW non-fossil fuel capacity target by 2030, indigenous manufacturing is the backbone, turning challenges like supply chain vulnerabilities into opportunities for technological sovereignty.

Forging Indigenous Manufacturing: From Cells to Components

At the forefront of this revolution is the domestic production of solar photovoltaic (PV) modules, cells, and related components. In 2014, India's solar PV manufacturing capacity stood at a modest 2.3 GW. Today, under the PLI Scheme for High Efficiency Solar PV Modules, allocated Rs. 24,000 crores, it has surged to an astonishing 100 GW, an eight-fold increase, as listed under the Approved List of Models and Manufacturers (ALMM). This milestone, achieved in August 2025, is a testament to Prime Minister Modi's emphasis on self-reliance, attracting over Rs. 48,120 crores in investments and generating 38,500 direct jobs as of June 2025. Companies like Adani Solar and Waaree Energies have scaled up production, with facilities in Gujarat and Rajasthan producing high-efficiency monocrystalline cells. The scheme mandates local sourcing of cells, reducing imports from China and enabling exports worth billions. For instance, the Dholera Solar Park in Gujarat, a flagship project, relies on domestically manufactured modules, showcasing how state-industry partnerships under Modi's vision are powering mega-grids. Parallelly, battery manufacturing has emerged as a cornerstone for energy storage, vital for grid stability and electric mobility.

The PLI Scheme for Advanced Chemistry Cell (ACC) Battery Storage, approved in 2021 with an outlay of Rs. 18,100 crore, targets 50 GWh of domestic capacity by 2026. To date, it has drawn Rs. 45,000 crore in investments, with 85 companies approved for incentives totalling US$8.15 billion. Reliance New Energy Battery Limited (RNEBL), a subsidiary of Reliance Industries, signed a programme agreement in February 2025 for 10 GWh capacity in Jamnagar, Gujarat—the first gigafactory of its kind in India. This facility, eligible for PLI incentives, will produce lithium-ion cells for EVs and renewables, creating thousands of jobs and reducing reliance on imported batteries, which previously cost India over $2 billion annually. Ola Electric and Exide Industries are also ramping up, with the government's waitlist mechanism ensuring phased expansion. States like Tamil Nadu and Karnataka, with their progressive policies, host these plants, integrating them into industrial corridors.

The NGHM, launched in 2023 with Rs. 19,744 crore, is accelerating electrolyser manufacturing for green hydrogen—a game-changer for hard-to-decarbonise sectors like steel and fertilisers. Aiming for 5 million metric tonnes (MMT) of annual production by 2030, the mission has shortlisted 11 companies for 1.5 GW of electrolyser capacity, with 3,000 MW overall coming online by 2025. Ohmium International launched India's first green hydrogen electrolyser gigafactory in Hyderabad in 2024, partnering with Plug Power to produce 500 MW annually using proton exchange membrane (PEM) technology. Adani Group, in collaboration with Ballard Power Systems, is establishing a fuel cell and electrolyser facility in Mundra, Gujarat, targeting 1 GW by 2027. These initiatives, supported by SIGHT (Strategic Interventions for Green Hydrogen Transition) incentives, have awarded contracts for 412,000 tonnes of green hydrogen production, fostering a domestic supply chain and export potential to Europe and Southeast Asia.

Wind energy components are not lagging. India's annual wind turbine manufacturing capacity stands at 18,000 MW, with companies like Suzlon Energy, Inox Wind, and Siemens Gamesa leading the charge. In July 2025, the Ministry of New and Renewable Energy (MNRE) amended the Revised List of Models and Manufacturers (RLMM) to mandate local sourcing of key components—blades, towers, gearboxes, generators, and special

bearings—accounting for 65-70% of turbine costs. This policy, effective from August 2025, boosts domestic content from 20% to 70%, challenging Chinese imports and creating a level playing field for Indian OEMs. Suzlon's Pune facility now produces 3 MW onshore turbines with indigenously made blades, while Envision Energy's Gujarat plant focuses on offshore components. States like Maharashtra and Gujarat, with wind-rich coasts, are integrating these into hybrid parks to enhance grid resilience.

These manufacturing strides are interconnected: solar and wind feed electrolysers that produce hydrogen, which is stored in batteries and powers a resilient energy ecosystem. The Modi government's fiscal incentives, combined with ease-of-doing-business reforms, have de-risked investments, attracting global players such as GE Renewable Energy and fostering joint ventures.

Nurturing Innovation: Ecosystems, Startups, and Collaborations

Beyond manufacturing, innovation ecosystems are the lifeblood of India's energy R&D. The Startup India initiative, marking its ninth year in 2025, has propelled India to the third-largest startup ecosystem globally, with over 100,000 recognised startups and Rs. 7,381 crores committed to 720 in renewables alone. Prime Minister Modi has hailed it as transformative, emphasising "ease of doing innovation" through tax exemptions, funding, and mentorship. In clean energy, startups like Fourth Partner Energy (solar leasing) and CleanMax Solar have raised millions of dollars, scaling rooftop solutions for industries. The Rs. 1 lakh crore Research, Development, and Innovation (RDI) Scheme, approved in 2025, targets AI-driven clean energy, deep tech, and perovskite next-gen solar cells with 30% efficiency. An IIT Bombay startup under the National Centre for Photovoltaic Research and Education (NCPRE) is commercialising perovskite tandems, which MNRE sees as a "game-changer".

Testing centres form the quality backbone. The National Institute of Solar Energy (NISE) in Gurugram, a MNRE flagship, boasts NABL-accredited PV testing labs capable of evaluating 100 modules in eight hours, ensuring IEC compliance for exports. Launched in April 2025, its advanced facility supports ALMM certification. The Central Power Research Institute (CPRI) in Bengaluru handles inverter and storage testing, while regional centres such as the Sardar Patel Renewable Energy Institute (SPRERI) in Gujarat test solar thermal devices. For green hydrogen, dedicated labs under NGHM are emerging to address the need for accredited battery storage testing highlighted by NITI Aayog.

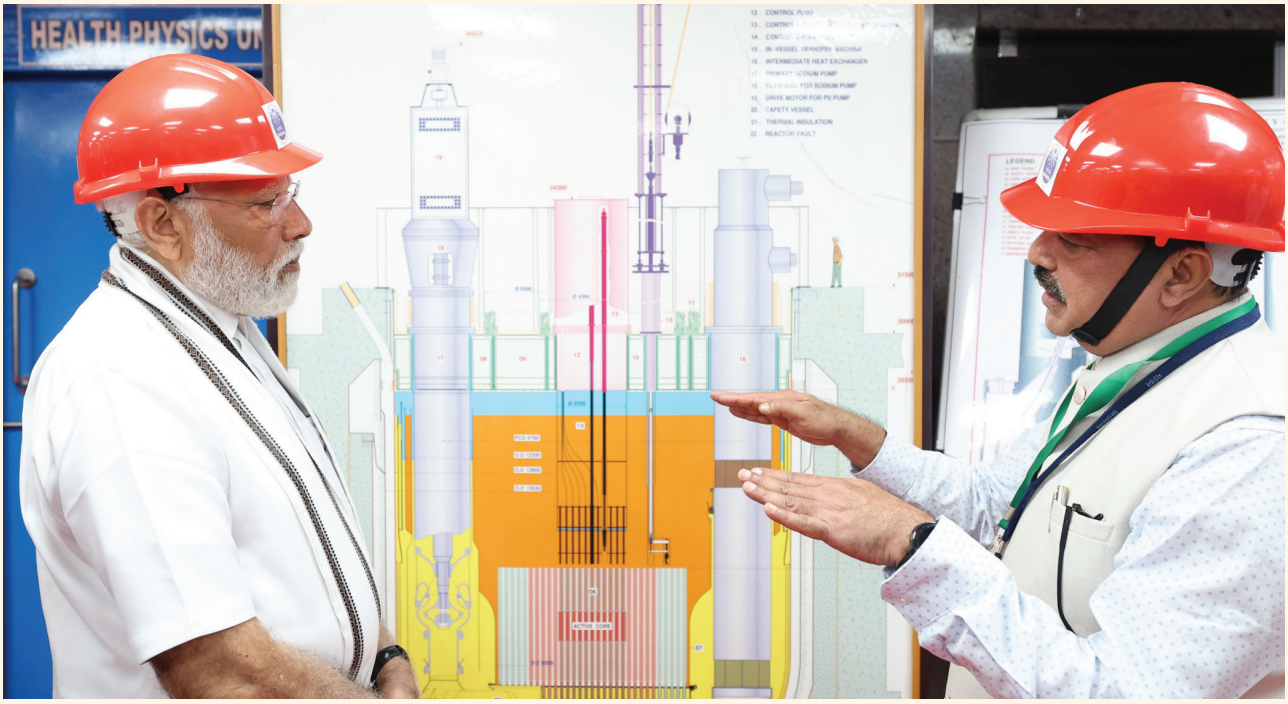
An IIT Bombay startup under the National Centre for Photovoltaic Research and Education (NCPRE) is commercialising perovskite tandems, which MNRE sees as a "game-changer".

University-industry collaborations amplify this. IIT Kanpur partners with Lohum CleanTech for sustainable battery recycling R&D, sponsoring lithium recovery projects. NCPRE at IIT Bombay integrates academia with Adani and Tata Power for solar innovations. The triple helix model, government, industry, academia, drives initiatives such as the India-US Triangular Development Partnership, which focuses on sharing RE expertise. In wind, IIT Madras collaborates with Suzlon on blade aerodynamics, while international ties, like the University of Oulu's hydrogen centre in India, enhance skills. These partnerships, backed by MNRE's Rs. 1,000 crore annual R&D fund, have yielded breakthroughs, such as efficient electrolysers from IISc Bengaluru.

A Future-Ready Energy Powerhouse

Technology, R&D, and indigenous manufacturing are scripting India's energy odyssey. From 100 GW solar prowess to gigafactories for batteries and electrolysers, and fortified wind supply chains, these efforts, bolstered by vibrant startups, testing hubs, and academic synergies, ensure energy security. With partnerships across states like Gujarat's industrial might and Karnataka's innovation corridors, India is not just self-reliant but export-ready, slashing emissions and fuelling Viksit Bharat by 2047. This is more than policy; it's a legacy of sustainable sovereignty.

Atoms for Atmanirbharta: How Modi Revived India's Nuclear Dream



Tejasv Bhardwaj
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When the history of India's energy transformation is written, the 2014–2030 decade will be remembered as the era when nuclear power moved from the margins of policy debate to the heart of national strategy. Under the leadership of Prime Minister Narendra Modi, India has pursued one of the world's most ambitious clean-energy expansions not just through solar and wind, but by reviving the country's long-dormant nuclear programme as a pillar of self-reliance and energy sovereignty.

The Modi government's nuclear push began with a clear conviction: India cannot rely on fossil imports forever, nor can it sustain industrial growth on intermittent renewables alone. Nuclear energy offers the perfect balance of zero emissions, reliable baseload, and immense scalability. In 2017, the Union Cabinet approved the construction of ten indigenous 700 MW Pressurised Heavy Water Reactors (PHWRs) in fleet mode, the single largest expansion in India's nuclear history. This decision marked a turning point, as it signalled a shift from isolated projects to a continuous production line built, supplied, and operated by Indian hands.

That policy vision is now visible on the ground. The Kakrapar Atomic Power Station Units 3 and 4 in Gujarat have already achieved commercial operation, proving the success of India's indigenous reactor design. At Rajasthan's Rawatbhata site, Unit 7 has reached first criticality and was successfully connected to the grid in March 2025, starting

commercial operations in April 2025. While Kaiga Units 5 and 6 are advancing in construction. Together, these reactors embody the Modi government's "Make in India" approach, using Indian technology, materials, and expertise to generate clean, dependable power for decades. Parallelly, the government has deepened cooperation with global partners to expand technological capacity. The Kudankulam project in Tamil Nadu, a joint venture with Russia's Rosatom, is adding four new 1,000 MW light-water reactors. Meanwhile, the Jaitapur project in Maharashtra, in collaboration with France's EDF, is envisioned to become the world's largest nuclear power station, housing six advanced EPR reactors. These partnerships are not just about foreign technology; they are about integrating India into global nuclear supply chains and advancing its status as a civil nuclear power under the Make in India framework.

But the Modi government's nuclear vision is not limited to large-scale plants. Recognising the evolving nature of energy systems, the government has initiated work on Small Modular Reactors (SMRs), compact, factory-built nuclear units capable of powering industrial zones and remote regions. This innovation aligns with India's push toward decentralised, clean, and flexible energy solutions, ensuring that even smaller states and rural clusters benefit from advanced technology.

India's nuclear ambition is also backed by a long-term perspective. While the current installed capacity is around 8,000 MW, the government plans to reach 22.5 GW by 2031 and an aspirational 100 GW by 2047, the centenary of Independence. This scale-up would ensure that nuclear energy contributes nearly 9% of India's electricity, complementing the nation's vast renewable generation capacity. For a country targeting net zero by 2070, nuclear provides the stability and continuity that renewables alone cannot offer.

The geopolitical and strategic dimensions of this shift are equally profound. By diversifying its energy base, India reduces its dependence on volatile oil and gas markets. Domestic uranium mining and secure international fuel partnerships, especially with Kazakhstan, Canada, and Australia, are reinforcing supply resilience. The revival of long-term research at institutions like the Bhabha Atomic Research Centre (BARC) and the exploration of thorium-based reactors add another layer of self-sufficiency to India's energy arsenal.

Critics often point to the high capital costs and long construction timelines of nuclear projects. Yet, the government's fleet-mode construction and standardised PHWR design directly address these concerns, reducing costs through economies of scale, shortening build times, and building specialised domestic capability. Moreover, as fossil subsidies decline and carbon pricing intensifies globally, nuclear's clean, consistent output will emerge as one of the most economically viable backbones of India's power grid.

Modi government's "Make in India" approach, using Indian technology, materials, and expertise to generate clean, dependable power for decades.

Perhaps the most remarkable feature of this nuclear revival is its quiet efficiency. Unlike earlier decades, when ambitious announcements rarely translated into outcomes, the Modi government's nuclear policy has been characterised by discipline, coordination, and continuity. Each project, whether domestic or international, fits within a coherent vision: ensuring that every household, factory, and city is powered by energy that is secure, clean, and proudly Indian.

In essence, India's nuclear resurgence is not just an energy policy; it is an assertion of national will. It signifies a Bharat that no longer waits for permission to build its future, a Bharat that combines science, sovereignty, and sustainability. As Prime Minister Modi often reminds the nation, "Atmanirbharta is not isolation—it is confidence." The nuclear power renaissance of the past decade embodies that confidence perfectly: a silent revolution lighting up India's journey toward a secure, prosperous, and carbon-free tomorrow.

The New Oil Order: India's Assertive Energy Diplomacy under Modi

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Energy has always been the lifeblood of a nation's economy and security. Hence, for a country like India, the world's largest energy consumer, ensuring uninterrupted fuel supplies is not just an economic necessity but also a matter of national sovereignty. Under the visionary leadership of Prime Minister Narendra Modi, the country has taken historic steps to build Strategic Fuel Security, ensuring the nation is no longer vulnerable to global shocks, disruptions, or pressure tactics.

In addition, energy has become central to India's foreign policy. To secure India's growth and green goals, the government is forging partnerships across oil, clean tech, critical minerals, and cross-border infrastructure. This article details how bilateral deals, global alliances, and regional links are strengthening India's energy security while advancing its aims for a greener future.

Strategic Petroleum Reserves: India's Shield Against Global Shocks

One of the boldest achievements of the Modi government has been the expansion of Strategic Petroleum Reserves (SPR). These underground rock caverns, located in Visakhapatnam, Mangaluru, and Padur, are India's insurance against emergencies.

- 1. Phase 1 of SPR ensured a storage capacity of 5.3 million tonnes, covering around 9.5 days of crude oil requirement.
- 2. Under PM Modi's leadership, Phase II expansion is adding another 6.5 million tonnes, ensuring India has strategic cover over 22 days of oil demand.

This is not just a storage, but a Shield of Sovereignty. In times of crisis, whether wars, sanctions, or global supply disruptions, India now has a safety net to protect its citizens and economy.

Diversifying Imports and Strategic Pacts

India has steadily broadened its import basket, reducing overreliance on any single region. From sourcing oil in 27 countries a few years ago, India now taps around 40 suppliers, supported by long-term LNG contracts with the U.S., Australia, and Qatar, as well as deeper ties with the Middle East and Russia.

Petroleum Minister Hardeep Singh Puri has emphasised that such "smart energy diplomacy" helped shield India from oil price shocks above $130 per barrel. Russia, once a marginal supplier, is now India's top crude source, accounting for about 35% of imports in 2023–24, up from just 2% before 2022, while also partnering on nuclear projects at Kudankulam.

Alongside this, India has strengthened energy ties with the U.S. through the Strategic Clean Energy Partnership, focused on renewables, hydrogen, and supply chains. With Gulf partners, India has introduced rupee-settled oil trades with the UAE and discussed joint storage and refinery investments with Saudi Arabia. Collectively, these efforts have given India leverage to source competitively, reduce dependence on OPEC and contribute to global price stability.

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Long-term contracts with West Asian nations such as the UAE, Saudi Arabia, and Iraq have been strengthened. Strategic crude imports from Russia at discount prices, despite Western pressure, showcase India's sovereign decision-making. This bold move alone saved India billions of dollars and kept inflation under control. By refusing to bow down to Western diktats and continuing oil purchases in India's interest, PM Modi has proven that Washington or Brussels will not dictate Bharat's energy policy, but by the needs of 1.4 billion Indians.

Global Clean-Energy Alliances and Leadership

India has emerged as a leader in global clean-energy alliances. The International Solar Alliance, launched with France in 2015, now unites over 120 countries to mobilise $1 trillion for solar by 2030, boosting India's solar exports and influence. Building on this, Modi unveiled the Global Biofuel Alliance at the 2023 G20 Summit, fostering sustainable trade in biofuels and technology exchange. India also plays a proactive role in the Clean Energy Ministerial and Mission Innovation, promoting initiatives like "One Sun, One World, One Grid" for cross-continental renewable sharing. These platforms attract investment and innovation in solar, hydrogen, and batteries, directly supporting India's domestic goal of 500 GW of renewables by

2030 while reinforcing its leadership as a climate-responsible nation.

Resilient Import Routes - No More Checkpoint Vulnerabilities

India was vulnerable to choke points like the Strait of Hormuz and the Malacca Strait, where even minor disruptions could paralyse crude oil movement. Under Prime Minister Modi's leadership, this vulnerability has been systematically addressed. Naval cooperation in the Indian Ocean Region(IOR) has been intensified to safeguard sea lanes and ensure the uninterrupted flow of crude. At the same time, India has invested in alternative routes and diversified its network of shipping partners, reducing the risks associated with overdependence on a few strategic passages. In a forward-looking step, agreements with the UAE have enabled India to store crude abroad, effectively creating a global oil cushion that can be accessed during emergencies. Together, these measures ensure that no single chokepoint can hold India hostage, strengthening the nation's strategic autonomy and energy resilience ensuring that no single checkpoint can hold India hostage.

Regional Energy Connectivity with Neighbours

While engaging globally, it is worth noting that Prime Minister Modi's "Neighbourhood First" policy has effectively strengthened both India's energy security and regional prosperity. The 2019 India-Nepal pipeline and the 2023 India-Bangladesh Friendship Pipeline supply affordable fuel while opening stable export avenues for Indian refiners. Hydropower cooperation with Bhutan and Nepal has expanded, with Indian firms investing in new projects and enabling surplus power exports to India.

Indian industry has equally benefited from this outward-looking approach. With one of the world's largest refining capacities, India has become a major exporter (2025) of petroleum products to Europe, Africa and Asia, often processing discounted Russian crude into fuels that plug global shortages. Indian companies are also investing abroad, from oil and gas assets in Russia and Africa to solar parks and hydro projects in South Asia, aligning diplomacy with commercial gains.

Conclusion:

The Modi government has redefined India's approach to energy. From building reserves and diversifying sources to empowering citizens and securing supply chains, India today stands firm, confident and resilient. Energy diplomacy under Prime Minister Shri Narendra Modi Ji has combined pragmatism and vision. By engaging diverse partners from Moscow to Washington, Riyadh to Dhaka, India has secured affordable supplies, advanced clean energy and deepened regional and global cooperation. This balanced and forward-looking strategy is not only powering India's growth but also contributing to global energy stability and sustainability.

Renewable Republic: How Legal Reforms under Modi are Powering India's Green Transition

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Energy security is a matter of constitutional and policy consequence; the State's obligations under the Directive Principles to secure and conserve material resources for the common good, and the regulatory architecture necessary to guarantee supply, reliability, and intergenerational equity. Over the last decade, the Union Government under Prime Minister Shri Narendra Modi has operationalised these obligations through a coherent statutory, regulatory and incentive framework that foregrounds solar and wind as pillars of India's energy sovereignty. This article analyses the legal and policy instruments that sustain that transition, illustrates three state-level models of implementation, and assesses decentralised solar and the domestic manufacturing push as instruments of energy justice and strategic autonomy.

1. Statutory & Regulatory Foundation: law, obligations and institutional architecture:

India's energy transition is anchored in clear, presently operative laws and institutional mandates. The Electricity Act, 2003, establishes the legal framework for generation, transmission, distribution, trading and efficient use of electricity and empowers regulators to prescribe obligations for integration of renewables and protection of consumer interests.

Complementing the Electricity Act is the Energy Conservation Act, 2001, and the statutory Bureau of Energy Efficiency (BEE), which together create standards and labelling, performance norms, and demand-side obligations that reduce overall system stress and improve load profiles, providing a legal backbone for integrating variable renewables.

At the executive-policy level, India's long-run commitments—captured in the Panchamrit pledges at COP26 include an express national target of 500 GW of non-fossil capacity by 2030 and a pledge to meet a significant fraction of energy needs from renewables; these commitments convert international political undertakings into a domestic planning constraint that informs procurement, grid planning and incentives.

To operationalise manufacturing and deployment, the Central Government has deployed targeted instruments such as Production-Linked Incentives (PLI) for high-efficiency solar PV modules, with the express statutory/financial sanction to scale domestic manufacturing capacity and reduce import dependence.

Legal implication: Together, these statutes, regulatory mandates, and incentive schemes form a layered legal architecture that converts constitutional and international commitments into enforceable obligations, procurement rules, and fiscal instruments.

2. State Models: Rajasthan, Gujarat & Tamil Nadu

States play a decisive implementation role under India's federal schema: the Centre sets targets and financial incentives, while States operationalise procurement, land-use permissions and distribution compliance.

Rajasthan: Utility-scale solar and land-use optimisation. Rajasthan's facilitation of large solar parks (e.g., Bhadla) demonstrates how state land policy, streamlined approvals and grid evacuation planning create scale economies for utility-scale solar deployment. The Rajasthan experience illustrates the legal coordination needed between state revenue, environment and electricity regulators to convert resource endowments into installed capacity.

Gujarat: Rooftop adoption and local manufacturing. Gujarat has paired aggressive rooftop programmes with local manufacturing incentives to create both demand and supply clusters for solar modules and components. The state model shows the synergy between state industrial policy, distribution company (DISCOM) facilitation and municipal implementation of rooftop net-metering arrangements.

Tamil Nadu: Wind integration and regulatory enforcement. Tamil Nadu's early investment in wind and the State Electricity Regulatory Commission's subsequent regulatory work to integrate wind into dispatch and ancillary markets offer a template for managing variability through market and grid discipline.

Legal implication: These three models underscore cooperative federalism, where statutory targets and central incentives require state-level regulatory calibration, land policy alignment and distribution reforms for effective deployment.

3. Decentralised Solar: rights, entitlements and rural empowerment

Decentralised solar advances distributive justice while alleviating grid stress.

Two instruments are central:

Farmer-centric solar (PM-KUSUM): The PM-KUSUM scheme provides central financial support for decentralised ground-mounted plants and solar pumps, enabling farmers to generate income by selling surplus to the grid and reducing diesel dependence.

Rooftop & village solar schemes: Central and state initiatives to incentivise rooftop installations and community microgrids create enforceable entitlements to electricity access where grid extension is uneconomic.

Legal implication: Decentralised solar reframes electricity from a commodity into a quasi-entitlement for households and rural stakeholders, requiring regulators to adapt net-metering rules, safeguard consumer rights, and provide dispute-resolution mechanisms under the Electricity Act.

4. Manufacturing, finance & institutional instruments: strategic autonomy

Strategic autonomy requires domestic capacity and international engagement. India's PLI programme for high-efficiency solar PV modules (with multi-thousand-crore outlays) seeks to build GW-scale manufacturing capacity and supply-chain resilience.

Concurrently, institutional mechanisms such as the International Solar Alliance (ISA), hosted in India, which provide diplomatic leverage and a platform to export Indian policy models globally, converting domestic scale into normative leadership in solar governance.

Legal-policy implication: Combining fiscal incentives, export diplomacy, and regulatory predictability creates a durable scaffold for industrial policy aligned with constitutional commitments to employment and public welfare.

Conclusion: Jurisprudence of a Renewable Republic

India's renewable transition is not a mere technological programme; it is a legal-policy project shaped and accelerated by the vision of Prime Minister Shri Narendra Modi. Through statutes like the Electricity Act and the Energy Conservation Act, and missions such as the National Solar Mission and PM-KUSUM, the government has created a binding framework that operationalises constitutional obligations into enforceable rights, regulatory duties, and fiscal instruments.

What distinguishes the Modi government's approach is the combination of scale, speed and sovereignty, scaling renewable capacity to global leadership levels, accelerating deployment through cooperative federalism with states, and ensuring sovereignty by strengthening domestic manufacturing and strategic autonomy. Initiatives like the Production-Linked Incentive scheme and the International Solar Alliance embody this vision, securing India's rightful place as a rule-maker in global clean energy governance.

As India advances towards the centenary of Independence in 2047, the renewable revolution under our PM Modi's leadership will be remembered as a decisive step in building an energy-secure, environmentally responsible, and sovereign Republic. It demonstrates that India, under visionary leadership, can simultaneously pursue growth, equity, and sustainability — a model for the world and a step towards realising the aspiration of Vishwaguru Bharat in the energy domain.

Balancing Growth and Green: How the Modi Government is Reshaping India's Energy Mix

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Policy Consultant at
Nation First Policy
Research Centre

India is at a critical juncture in its resurgence as a global economic superpower, and its energy mix is fueling this momentum. Strategic as well as moral interests dictate diversification and decarbonisation to sustain the rapid growth rates achieved in recent years.

Taking centre stage in the fight against climate change, Prime Minister Shri Narendra Modi at the COP26 Glasgow Climate Summit gave the clarion call of 'sam-gacchadhvam' to move together towards a climate-neutral world. With these ideas, India has embarked on an ambitious program that tackles the twin agendas of energy security and climate change in a concerted manner.

Renewables: Driving India's Energy Transition

Push towards renewable energy and solar projects has been a key agenda of the Prime Minister's energy policy. Initial targets were set at 175 GW of renewable power by 2022. These targets were met and replaced by more ambitious 'Panchamrit' commitments, which include 500 GW of non-fossil power by 2030 and a 50% share of renewables in the mix. India's total installed capacity of renewables has reached 220 GW with a record addition of 30 GW in FY25-26. With schemes including setting up 40GW of Solar Parks and Ultra Mega Solar Projects, PLI scheme for High Efficiency Solar Modules, PM-KUSUM, Rooftop Solar Program and Green Energy Corridors for evacuation of Renewable Energy, India is implementing the largest Renewable Energy (RE) expansion program in the world, envisaging a 5-fold increase in the overall RE capacity.

India is leading the creation of a unified global solar grid under the International Solar Alliance, an initiative announced by Prime Minister Shri Narendra Modi in 2015. Success stories abound in states. Gujarat is leading India's solar boom, accounting for nearly two-thirds of rooftop solar power, with a focus on digitisation. Rajasthan has leveraged its geographic advantage and high solar irradiation to install over 20 GW of solar power and houses India's largest solar park. The Rewa Ultra Mega Solar Plant in Madhya Pradesh is supplying power to destinations as far as the Delhi Metro.

Under the leadership of Prime Minister Shri Narendra Modi, India is showing the world the path to better energy and climate futures

Gas Grids: Clean Fuel at the Doorstep

In line with the Prime Minister's vision of clean cooking fuel to every household, the number of LPG connections nearly doubled from 14.52 crores in 2014 to 32.83 crores in 2024. The length of the operational Natural Gas Pipeline in the country has increased from 15,340 Km in 2014 to 24,945 km in 2024. Further, development of about 10,805 km of Natural Gas Pipeline is under execution. To synchronise all gas grids in India, the 'One Nation One Gas Grid' program has been launched. Further, Jagadishpur –Haldia –Bokaro- Dhamra Pipeline (JHBDPL) project and approximately 750 km long Barauni-Guwahati pipeline will connect the gas-rich North East region with the National Gas Grid. Additionally, the NITI Aayog is considering plans to blend DME with natural gas under the Methanol Economy program.

Reforming India's Coal-Based Power Setup

India's coal production has reached a record 1 billion Tons in 2025. The coal sector has undergone a paradigm shift through transparent auction regimes, increased private-sector participation, and technological modernisation under the NDA government, in a radical turnaround from the earlier, arbitrary, corruption-ridden regime. The government is also invested in a mission-mode effort to revitalise the coal-based thermal power setup. With the launch of the SHAKTI Policy, coal allocations to power generators have moved from discretion and secrecy to a new dawn of transparency and flexibility through competitive bidding.

Under the leadership of Prime Minister Shri Narendra Modi, power production has increased by nearly 60% over the past decade. SHAKTI Policy has had a remarkable impact, with average electricity prices dropping by 11% since 2017 and Plant Load Factors rising. The government has successfully resolved 30 of 49 stressed assets in the sector, totaling 32 GW of capacity. The government is also promoting pithead and hybrid power plants as a policy measure, along with the sale of surplus energy on exchanges. These measures are set to yield rich dividends across efficiency, environment and energy security.

Nearly 40% of India's coal resources are unmineable using conventional methods. Harnessing these resources through gasification is a significant step towards energy security and diversification. The government has formulated Unified Licensing Mechanisms under the HELP Policy 2016 and has assigned exploration and exploitation rights to Coal India Limited (CIL) to tap the Coal Bed Methane potential. NITI Aayog has been pursuing its flagship

'Methanol Economy Program' aimed at the production of methanol and derivatives from coal-based resources, to be used as a clean blended fuel.

Hydrogen Technologies: Fueling the Future

To position India at the forefront of the global green energy transition, the government has launched the National Green Hydrogen Mission to establish India as a key player in hydrogen production, storage, and application across sectors. India aims to produce 5 million metric tons (MMT) of Green Hydrogen annually and add 125 GW of renewable energy capacity dedicated to hydrogen production.

These initiatives are expected to help reduce 50 million metric tons of CO_2 emissions annually, save ₹1 lakh crore in imports, and attract investments worth ₹8 lakh crore. In line with these efforts, an indigenously produced 1 MW Green Hydrogen plant has been commissioned in Kandla, and the world's largest Green Hydrogen-powered train is set to commence operations between Jind and Sonipat in Haryana. India's first hydrogen-powered trucks have started rolling out with the target of running at least 1,000 hydrogen-powered trucks and buses by 2030.

Industrial Decarbonisation: Cleaner and Greener Manufacturing

To improve energy efficiency and decarbonise the industrial sector, the Energy Conservation Act was amended in 2022 to enable carbon trading and mandate the use of non-fossil fuels. The Carbon Credit Trading Scheme (CCTS) was launched in 2023 to align India's carbon trading regime with global standards. The government also aims to establish India's own carbon market by mid-2026, a move expected to help industries transition towards cleaner energy and align with global emission standards.

The Ministry of Steel is preparing the 'Green Steel Mission' with an estimated cost of Rs 15000 Crore to help decarbonise the steel industry. Carbon Capture and Storage (CCUS) technologies are being developed and promoted for the oil and gas industry. The Cement Industry is exploring transitioning to dry processes, implementing Waste Heat Recovery Systems (WHRS), and increasing the use of alternative fuels and raw materials (AFR) in its move towards decarbonisation.

Double Engine: State Efforts towards Decarbonisation and Diversification

Gopalpur Industrial Park (GIP) in Odisha is emerging as a centre for green hydrogen and clean energy in India. The cluster has secured early investments in green hydrogen and solar cell and module manufacturing, with further projects under review. Maharashtra's policy framework envisions producing 5 million metric tons of green hydrogen annually and reaching 52% green and renewable energy by 2030. To achieve this, the Green Hydrogen Cluster has been set up in the Mumbai Metropolitan Region (MMR). This initiative focuses on decarbonising Mumbai's dense urban-industrial landscape while creating green jobs.

The AM Green Kakinada Cluster, located in Andhra Pradesh, India, is being developed as a green industrial cluster delivering industrial decarbonization solutions globally, with a planned investment of $3 billion and $15 billion in upstream investments. It seeks to establish a resilient green hydrogen ecosystem by integrating mature, commercially viable technologies to ensure effective, rapid execution and scalability. These and other similar efforts by NDA led states are supplementing India's energy vision and walking hand in hand with the Centre.

Leading the Way

India's import dependency has steadily declined since 2014-15, decreasing from 26% to about 21% in 2023-24. Under the leadership of Prime Minister Shri Narendra Modi, India is showing the world the path to better energy and climate futures. Environmental conservation and concern for nature have always been a key element of the Indian civilizational ethos, and India is dutifully bound to the pledge. As India marches towards its destiny as a global superpower and the world grapples with the sordid realities of climate change, the current leadership remains well-equipped to lead the way.

Storing the Future: Batteries at the Heart of India's Energy Independence

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Solar power generation in India has grown more than thirty-fold from less than 3GW to over 100GW in the last decade. This transformation puts India as one of the world's largest clean energy producers. Wind power, too, has grown steadily, and renewables collectively now form a major part of the country's electricity mix.

India, thus, has not only been reducing its dependence on fossil fuels but also silently emerging as the global leader in the fight against climate change. However, renewable energy comes with its own challenges, namely that it is intermittent: solar generation halts after sunset and on cloudy days, while wind turbines require wind to generate electricity. This not only means there would be no electricity generation in non-solar/non-wind hours, but it could also threaten the stability of the grid itself. It would also mean that India would risk falling back on coal / imported gas during peak-hour demands. This would not only undermine India's energy security goals but also its climate change goals.

Prime Minister Modi has emphasised the need for energy independence through self-reliance and sustainability. This is where Battery Energy Storage Systems, or BESS, play an important role. BESS systems store excess renewable power when it is generated and release it into the grid later when demand peaks. Thus, BESS makes clean energy truly round-the-clock. This helps stabilise the grid and reduce blackouts.

Recognising the need for BESS, the Modi government, in its now well-known decisive style, moved quickly to integrate storage into the national electricity framework. The Viability Gap Funding scheme supports the rollout of large-scale storage projects, while the PLI scheme helps build domestic manufacturing capacity for battery systems used in BESS projects. Together, these initiatives will help India reduce its reliance on imported batteries and align with PM Modi's vision of Make in India and Aatmanirbhar Bharat.

PM Modi's government has launched a major push to expand battery energy storage in the country, focusing on developing alternative materials, improving recycling systems, and exploring new mineral sources.

The government's policy & regulatory reforms have also helped reinforce the momentum of BESS in India. The Ministry of Power introduced guidelines mandating the use of indigenously developed software for BESS projects supported by the Government of India under the Viability Gap Funding scheme.

Further, inter-state transmission system charges for renewable energy projects co-located with energy storage systems have been waived until June 30, 2028, improving the financial viability of such projects. These policies reflect a larger shift toward integrating storage as a core component of India's energy infrastructure.

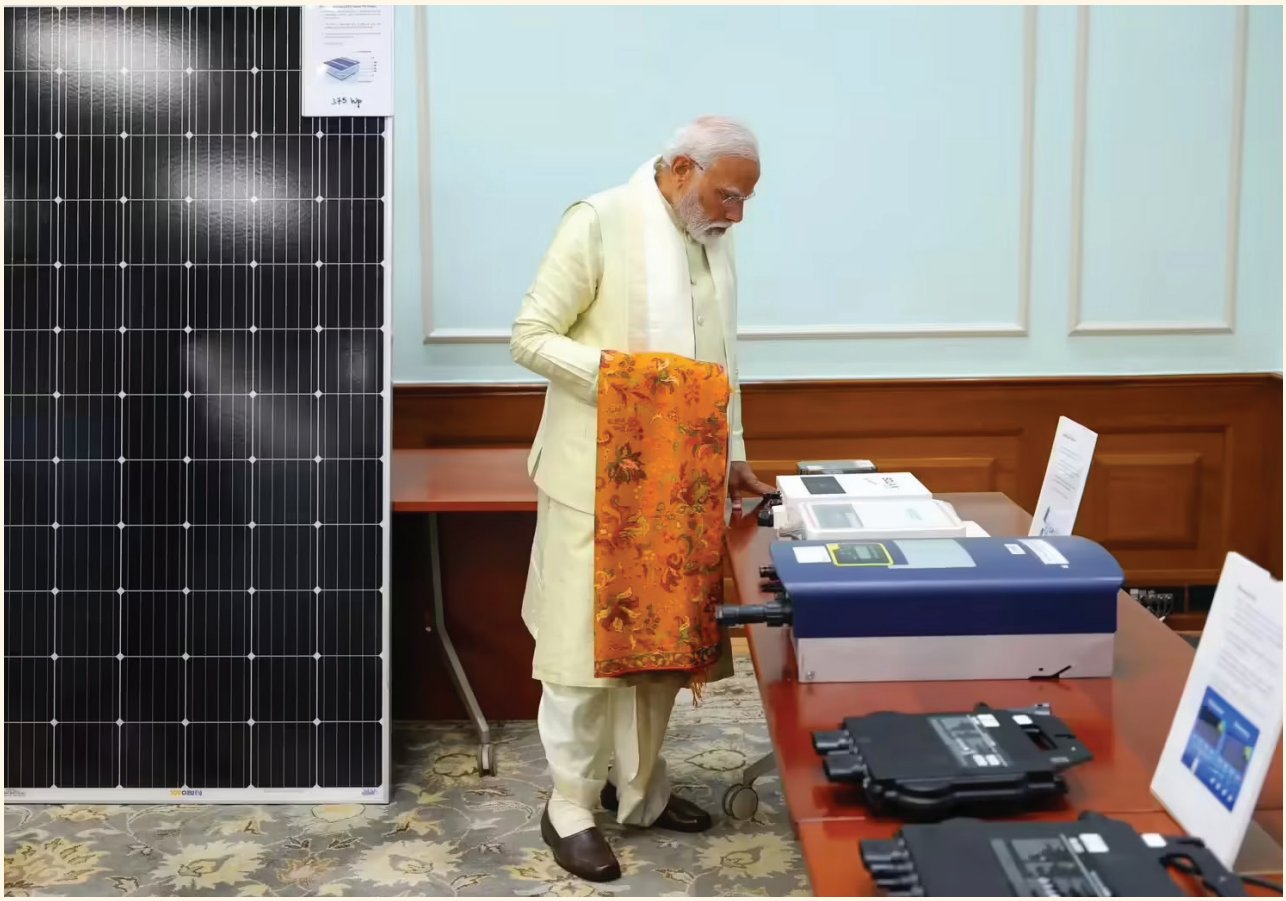
India's laws/rules surrounding BESS are still developing. While the Electricity Act, 2003, doesn't define energy storage, the government, by way of the Electricity (Amendment) Rules, 2022, officially gave recognition to energy storage systems in the power system. More recently, the government notified the Electricity (Amendment) Rules, 2025, which allow energy storage systems to be used independently or as part of generation, transmission, or distribution infra. The 2025 rules also allow industrial and commercial establishments to invest in their own batteries and pave the way for household and community storage in the future.

To support BESS, the Ministry of Power introduced something called Energy Storage Obligations. This requires electricity distribution companies to store a small portion of the renewable energy they use. The target starts at 1% in 2023–24 and rises to 4% by 2029–30. Most of the stored energy must come from renewable sources like solar or wind.

In 2023, the government also released a National Framework for Energy Storage Systems. It sets basic safety rules, how storage connects to the grid, and where it can be used. It's important to note that this framework highlights that by 2047, the requirement for energy storage would be around 320 GW, with about 230 GW from BESS.

The urgency of storage is already visible. In mid-2025, during periods of peak solar generation, gigawatts of renewable power were curtailed due to grid constraints and low demand. In fact, some reports at the time suggested that India had to curtail around 20 GW of solar energy from the grid. Developers lost hundreds of crores in revenue, and clean energy went unused. It is in these cases that BESS makes a material difference by storing surplus energy and releasing it during evening peaks/non-solar hours, thereby providing stability to the grid.

International examples also show what is possible. Reports indicate that in 2024, in California —supposedly one of the biggest grids in the world — BESS was the single largest source of power into the grid on multiple occasions. This would thus mean that BESS has played an important role in



preventing outages. The everyday utility of such grid-scale storage has been safely proven.

The benefits of a thriving storage industry extend far beyond electricity. As India moves into its Viksit era of technology, manufacturing and data centres, BESS could play the much-needed backup role for all such critical infrastructure. Not only a civilian play, but also in an era of new-age warfare where coordinated attacks can bring down entire power grids, BESS would also go a long way toward powering critical defence facilities and India's war rooms.

When we thus look at it through this lens, battery storage is no longer about clean power but rather about sovereignty and leadership.

Therefore, even though India still faces hurdles such as high costs and limited access to key minerals like lithium and cobalt, PM Modi's government has launched a major push to expand battery energy storage in the country, focusing on developing alternative materials, improving recycling systems, and exploring new mineral sources.

The Government is making big plans to expand energy storage to ensure that India has one of the largest energy storage systems in the world by the 2030s. This transition to clean energy is no longer just about solar panels and wind turbines but rather about what happens when the sun-sets and the wind doesn't blow. Under Prime Minister Modi's leadership, India has laid the policy and regulatory foundation for storage to thrive. With coordination between the Centre and the states, BESS can transform India's renewable sector.

The question is no longer whether India can generate enough renewable energy. The question is whether we can store it. Thanks to the government's bold vision, the answer looks increasingly promising. Promising for Aatmanirbhar Bharat, for Viksit Bharat, and for a cleaner, more secure future.

Powering Viksit Bharat: Decade of Energy Independence & Innovation

Ruchir Singh Kamboj
Columnist

India's rise toward self-reliance and global leadership is closely tied to its energy security, which now powers millions of transformed lives. Under the visionary leadership of Prime Minister Shri Narendra Modi, India has launched a groundbreaking energy revolution driven by innovation and determination.

This transformation carries profound geopolitical weight. As global energy markets face volatility due to shifting alliances and supply disruptions, India's growing energy independence grants it greater diplomatic leverage and stability in global geopolitics. Building a diversified energy portfolio makes India more resilient to external shocks, securing both its economic growth and national security.

At its core lies a steadfast commitment to a cleaner, more prosperous future. In just over a decade, India has nearly tripled its renewable energy capacity, from 76 GW in 2014 to around 227 GW by mid-2025. Aligned with its COP26 commitments, the Ministry of New & Renewable Energy aims to achieve 500 GW of non-fossil fuel capacity by 2030. Renewables now account for nearly half of India's total installed capacity of 476 GW, powering a Viksit Bharat driven by sustainable progress.

Consider Diu, a coastal district that once struggled with power scarcity, now meeting its entire daytime power demand solely through solar energy. Programs like Pradhan Mantri Surya Ghar: Muft Bijli Yojana democratise access to energy, empowering communities and promoting green livelihoods.

Rural resilience is strengthened by initiatives such as the Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM), which equips farmers to utilise solar energy for irrigation and surplus power generation, allowing them to transfer excess electricity back to the grid and earn additional income. Alongside this, India's rural energy landscape has also improved significantly through electrification schemes and decentralised renewable technologies like solar home systems and microgrids. Together, these efforts enhance energy reliability, uplift rural economies, and bridge the rural–urban energy gap, exemplifying how renewable energy fuels prosperity across Bharat's heartland.

India ranks among the world's leaders in renewable energy, 3rd in solar, 4th in wind, and 4th in overall renewable capacity. In 2025, it produced over 108,000 GWh of solar power, surpassing Japan. Solar manufacturing capacity has recently doubled, fueling employment and innovation. This surge significantly reduces India's carbon footprint and reinforces global climate commitments.

Yet, India's energy strategy extends beyond renewables. The nation is rapidly expanding the use of cleaner fuels like natural gas to improve accessibility and affordability, promoting inclusive growth. Coal remains essential but is adopting cleaner technologies to align with India's climate goals.

Furthermore, India's strategic foresight extends to fuel security, with the addition of 11.5 million metric tonnes to the existing 5.33 million metric tonnes of strategic petroleum reserves at Bikaner, Mangalore, and Bina. This expanded reserve cushions India against global supply shocks, strengthening energy security while bolstering economic stability and national security. This resilience is critical amid global tensions and market uncertainties.

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Meanwhile, government investments nearing ₹5 lakh crore will modernise the power transmission grid into a system that is flexible, resilient, and smart. As part of this modernisation effort, Green Energy Corridors are advanced transmission networks that link renewable resource-rich regions to demand centres, ensuring efficient, uninterrupted power flow. These corridors also safeguard energy delivery from climate extremes like floods and heatwaves, blending environmental sustainability with economic vigour.

Innovations in energy storage, including large-scale battery and pumped hydro projects, are vital for managing renewable energy variability and ensuring a stable, uninterrupted power supply. Supported by policy incentives such as the Production Linked Incentive (PLI) scheme, India is rapidly scaling domestic battery manufacturing and strengthening supply chains to position itself as a global energy storage hub.

Looking ahead, the National Green Hydrogen Mission aims to produce five million metric tonnes annually by 2030. This bold initiative is set to create over 600,000 jobs, reduce fossil fuel imports by more than ₹1 lakh crore, and fuel robust economic growth. By advancing green hydrogen technologies, India not only strengthens its energy security but also elevates its position in global fuel diplomacy, emerging as a leader in the clean energy revolution. Crucially, green hydrogen will play a pivotal role in decarbonising heavy industries and transport, driving sustainable growth for the future.

At the same time, India's electric vehicle sector is rapidly transforming transportation. Aiming for 80% adoption of two- and three-wheelers by 2030, this shift will improve urban air quality, reduce oil imports, and unlock new economic opportunities, steering the nation toward sustainable, inclusive mobility.

Supporting this sweeping transformation is a wave of financial innovation, including green bonds, public-private partnerships, and international cooperation, unlocking capital and technology flows, making India a shining beacon of sustainable progress on the global stage. Most crucially, this revolution thrives on Indian ingenuity: startups, academia, and industry pioneers drive technologies and inclusive practices. Millions of jobs and reskilling programs ensure the benefits reach all.

Approaching its centenary, India's energy revolution shines as a beacon of hope and strength. Guided by Prime Minister Modi, Bharat stands as a river of resilience, illuminating a future of light and promise from the Himalayas to the seas. This is not mere progress but a beacon of dreams, woven into the nation's spirit.

Arise Bharat: Fuelling Innovation, Self-Reliance and Energy Inclusion

Sankalp Devanand
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The land of Bharat, Aryavarta, was the cradle of critical discoveries and inventions. We have always struck a balance between development and sustainability. The Rishis, the ancient scientists, have repeatedly shown that progress and modernisation need not come at the expense of nature, consistently advocating for sustainable paths to advancement. Pradhan Mantri Narendra Modiji's vision of secure, clean, and inclusive growth—anchored in efficiency gains, rural inclusion, resilient infrastructure, and global partnerships—positions our nation as a powerhouse in the 21st-century energy economy, aligning with the wisdom of our Rishis.

Empowering Pradhan Mantri's Viksit Bharat 2047 Dream Through Research and Development-Powered Indigenous Manufacturing

Under the Prime Minister Shri Narendra Modi's visionary leadership, Bharat is charting a bold path toward an Atmanirbhar and Viksit Bharat by 2047, rooted in the people's mandate since 2014. The cornerstone of this ambition is the integration of cutting-edge technology, robust research and development, and indigenous manufacturing, particularly in the renewable energy sector. Modiji's mantra of "Zero Defect, Zero Effect" in manufacturing aligns with the commitment to achieving 500 GW of non-fossil fuel capacity by 2030—a pledge boldly reaffirmed in his Independence Day speeches and at global summits like COP-26. This is not just policy; it is a patriotic revolution positioning Bharat as the world's green powerhouse.

In technology, R&D, and indigenous manufacturing, Bharat is making strides in the domestic production of critical components, including solar cells, wind turbine parts, batteries, and electrolysers for green hydrogen. Initiatives like the Production-Linked Incentive scheme have spurred local manufacturing, reduced dependency on imports, and fostered job creation. For instance, the push for indigenous wafers and ingots in solar cells is accelerating, with the government targeting self-sufficiency to meet the 500 GW goal, around half of which has already been achieved. Complementing this are vibrant innovation ecosystems, including startups, dedicated testing centers, and university collaborations. Programs like the National Green Hydrogen Mission encourage R&D on electrolysers, while bio-manufacturing platforms leverage indigenous technology to develop sustainable energy solutions. These efforts build a knowledge base that enhances our technological expertise and drives efficiency in green technologies, such as electric vehicles and clean mobility, based on principles of connectivity and sustainability.

Strategic Financing and Policy Reforms for Energy Innovation

Financing these advancements is pivotal to India's renewable energy ambitions. The government has unlocked massive investments through innovative policy instruments. Green bonds, including sovereign issuances, have effectively channelled funds into renewable projects, with entities like the Indian Renewable Energy Development Agency (IREDA) benefiting significantly. Viability Gap Funding (VGF) ensures the commercial feasibility of Public-Private Partnerships (PPPs), particularly in critical infrastructure sectors such as urban transport and clean energy, thereby enabling high-impact projects. PPPs, alongside green bonds and Infrastructure Investment Trusts, have catalysed large-scale investments, bridging funding gaps and driving sustainable development. Additionally, the government's strategic policies, such as tax incentives for green investments and blended finance models, have attracted both domestic and global investors, amplifying the scale of renewable energy projects.

Our R&D expenditure, at approximately 0.65% of GDP, remains a concern, significantly trailing the global average of 1.79%. To realise PM Modi's ambitious vision of a self-reliant and developed Bharat, both the public and private sectors must

significantly increase investments in R&D. Enhanced funding would accelerate indigenous innovation, expand our knowledge base in advanced technologies, and foster breakthroughs in critical areas such as battery storage, wind turbine components, and green hydrogen electrolysers. To incentivise private-sector participation, the government could introduce a policy offering a 0.5% tax refund for every 2% increase in companies' R&D expenditure, capped at a 10% funding threshold. Further refunds could be provided to companies that achieve significant discoveries or impactful outcomes from their R&D programs, encouraging innovation-driven growth. The government has made strides in improving R&D spending, but sustaining growth to 2-3% of GDP is essential for long-term global competitiveness. Establishing dedicated R&D hubs and fostering collaborations among academia, industry, and startups will ensure that India remains at the forefront of technological advancements, aligning with PM Modi's goal of a sustainable and prosperous future.

Rural Electrification, Decentralised Energy, and Industrial Energy Security: Fortifying Inclusive and Resilient Growth

Bharat's energy narrative extends its transformative reach to the rural hinterlands and industrial bastions, embodying the Rishis' profound wisdom of harmonising human endeavour with the sanctity of nature. These initiatives, rural electrification and decentralised solutions alongside robust safeguards for critical infrastructure, propel the Atmanirbhar Bharat ethos, ensuring that the Viksit Bharat 2047 vision illuminates every hamlet while steeling our economic foundations against uncertainties. Anchored in efficiency, inclusivity, and sustainability, they reaffirm Modiji's commitment to a secure, clean energy future that resonates with our ancient legacy of balanced progress.

The Saubhagya scheme stands as a monumental legacy, having electrified nearly 2.86 crore households since its inception, extending the glow of development to the most inaccessible hamlets across Bharat's diverse terrains—from the verdant valleys of the Northeast to the arid expanses of the Thar Desert. This penetration has not merely banished darkness but ignited aspirations, enabling education, healthcare, and livelihoods in remote corners. Complementing this triumph are solar microgrids, innovative beacons of decentralised energy that deliver cost-effective, reliable power to off-grid rural zones. With ambitious rollout plans to deploy 10,000 new microgrids, these systems exemplify self-reliance, reduce fossil fuel dependence, and foster local innovation ecosystems. They align with Modi's green mandate, empowering rural economies through sustainable, resilient energy access.

Parallel to this rural renaissance is the expansion of clean cooking initiatives, commencing with the Ujjwala Yojana's distribution of LPG connections and evolving toward electric and solar cookstoves. These measures have dramatically curbed indoor air pollution, enhancing women's health and unlocking economic opportunities by alleviating the burdens of traditional fuel collection. In line with the Rishis' advocacy for holistic well-being, these interventions elevate Nari Shakti, transforming households into hubs of productivity and paving the way for gender-inclusive growth.

On the industrial front, energy security emerges as a cornerstone of Modiji's strategic foresight, with Bharat's installed power capacity reaching 491 GW as of September 2025, with non-fossil sources accounting for around 50%, a remarkable acceleration toward decarbonisation and sovereignty. This paradigm shift, propelled by the 500 GW non-fossil fuel target, underpins heavy industries and petrochemical sectors through diversified strategic fuel sourcing and captive power generation.

Pradhan Mantri Narendra Modi's vision of an Atmanirbhar and Viksit Bharat embodies his foresight: only through self-reliance and sustainability can Bharat emerge as a resilient, developed superpower, immune to external disruptions.


2030
2047
2070

BHARATIYA JANATA YUVA MORCHA