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# TRANSFORMING LIVES: INDIA'S PROGRESS IN SDG 7 ENERGY ACCESS

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**RESEARCH ARTICLE**

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**Abstract**

A modern society cannot function without electricity. It is essential everywhere, whether in classrooms, operation theatres, factories, or music concerts. However, this invaluable resource remains inaccessible to millions worldwide, including a significant portion of India's population. SDG 7, adopted by the United Nations, aims to provide electricity to every person globally. By setting this goal, it guides member countries to distribute electricity effectively to underprivileged communities. Electricity generation from fossil fuels pollutes the environment. Emissions of carbon dioxide, carbon monoxide, methane, and other greenhouse gases contribute to global warming. To address this, SDG 7 focuses on reducing fossil fuel use in electricity generation and promotes adopting non-conventional energy sources. Established in 2015, SDG 7 aims to ensure universal access to affordable, reliable, and modern energy; increase renewable energy; improve energy efficiency; promote clean energy investments; and upgrade energy services for developing countries by 2030. This paper appraises India's progress toward these goals.

**Keywords:** *SDG 7, Universal Energy Access, Renewable Energy, Sustainable Development Asceticism*

## Introduction

In 2015 United Nations set 17 Sustainable Development Goals (SDGs) with the objective to bring peace and prosperity for people and the planet. Before 2015 the UN were with the mission to reduce extreme poverty in the name Millennium Development Goals which were set in September, 2000 at Millennium Summit in New York. Later it was recognised that poverty elevation should be in such a way that improves our health and education, reduces inequality and preserves the environment. As a result of this, SDGs were set to achieve by 2030. Among these 17 SDGs, SDG 7 is significant as it ensures access to affordable, reliable, sustainable and modern energy for all.

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SDG 7 aims to ensure universal access to affordable, reliable, and modern energy; increase renewable energy; improve energy efficiency; promote clean energy investments; and upgrade energy services for developing countries by 2030.

**Objectives of the study:** This research paper aims to assess India's progress towards Sustainable Development Goal 7 (SDG 7), focusing on access to affordable, reliable, sustainable, and modern energy. It examines India's achievements in electrification, clean cooking, renewable energy, energy efficiency, and international cooperation. The paper also identifies remaining challenges and opportunities in achieving SDG 7 targets by 2030.

**Research Methodology:** Quantitative data on energy access, renewable energy, energy efficiency, financial flows etc. were collected from official government sources such as the Ministry of Power, Ministry of New and Renewable Energy, NITI Aayog, international organizations (like the IEA and UN) and the National Statistical Office. Academic research works and news articles, were also analyzed to interpret the quantitative findings.

**Targets of SDG7:** SDG7 is the first ever universal goal on energy targeting-

1. **Access to electricity and clean cooking fuel**: To ensure universal access to affordable, reliable and modern energy services by 2030, indicated by the proportion of population with access to electricity and primary reliance on clean fuels.
2. **Renewable Energy**: To increase substantially the share of renewable energy in the global energy mix by 2030, indicated by the share of renewable energy in the total final energy consumption. India aims to achieve 500 GW of non-fossil fuel-based energy capacity 2030.
3. **Efficiency**: To double the global rate of improvement in energy efficiency by 2030, indicated by intensity measured in terms of primary energy and GDP.
4. **International Cooperation**: To enhance international cooperation to facilitate access to clean energy research and technology by 2030, indicated by International financial flows to developing countries.
5. **Infrastructural development**: To expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries by 2030, indicated by installed renewable energy-generating capacity (in watts per capita).

## Achievements of India

**1: Access to Electricity and Clean Cooking Fuel**

**Electricity**

- **Deen Dayal Upadhyay Gram Jyoti Yojna**: Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY) was launched by the Government of India in 2014 with the aim of providing uninterrupted power supply to rural areas. The objective of this scheme matches with SDG7. India electrified more than 18,000 inhabited villages under this scheme within 2018. Later the activities under this scheme were transitioned into the Revamped Distribution Sector Scheme (RDSS).
- **SAUBHAGYA- Pradhan Mantri Sahaj Bijli Har Ghar Yojana:** Saubhagya scheme was launched in 2017 to achieve universal household electrification covering every village in the country. Within 2022, a total of 2.86 crore Households were electrified under Saubhagya Scheme. After 2022, the activities under this scheme were done under RDSS.
- **Revamped Distribution Sector Scheme (RDSS**): DDUGJY and SAUBHAGYA schemes did the preliminary work of rural electrification by the first quarter of 2022. 99.6 % of Indian population were under electrification at that point of time. RDSS took the charge after these two schemes with the objectives
    - to improve quality and reliability of power supply,
    - to minimize technical and commercial losses of electricity down to 12-15% by 2024-25,
    - to eliminate the gap between the Average Cost of Supply (ACS) and the Average Revenue Realized (ARR) by distribution companies (DISCOMs),
    - to upgrade and modernize the power distribution infrastructure and
    - to make electricity supply more affordable for consumers

    Earlier in 2014, The Integrated Power Development Scheme (IPDS) was launched with the same objectives. After the launch of RDSS this scheme was subsumed into RDSS.

    Technical and commercial losses were reduced to 15.38 % in 2022-23 as compared to 22.32 % in 2020-21. The ACS-ARR gap was brought down to 55 paise per kwh in 2022-23 from 92 paise per kwh in 2020-21. In early 2023, more than 20 crore smart meters were sanctioned under RDSS.
- **UDAY (The Ujwal DISCOM Assurance Yojana):** State Distribution Companies (DISCOMs) in the country had huge accumulated losses and outstanding debt. This scheme was launched in 2015 to ensure affordable and accessible 24x7 power supply to all by addressing the mounting debt and losses of DISCOMs and by improving the operational efficiency of DISCOMs. In 2019, UDAY2.0 was launched, which emphasised on the installation of smart prepaid meters. In early 2025, many states reported decrease in technical and commercial losses, moving closer to the target of 15%, financial savings of DISCOMs due to debt restructuring and reduction in interest cost and improved operational efficiency.

**Clean Cooking**

- **Pradhan Mantri Ujjwala Yojana (PMUY) 1.0:** PMUY 1.0, launched in May 2016 aimed to provide LPG connections to 50 million women members of below-poverty-line (BPL) households. The target was expanded in March 2018 to 80 million LPG connections, which was achieved in August 2019.
- **Pradhan Mantri Ujjwala Yojana (PMUY) 2.0:** Under this scheme the Govt. in the FY 2021-22 provided for an additional 10 million deposit-free LPG connections. As per the report of December, 2024 more than two crore LPG connections were released under this scheme. Since April 2014, the number of LPG connections have gone up from 14.52 crores to 32.83 crores (as on 01.11.2024), a growth of above 100 %. The Comprehensive Annual Modular Survey, released by the National Statistical Office for the July 2022–June 2023 period indicates that 92.9 per cent of households in urban areas used clean cooking fuel, while the share of households using clean fuel in rural areas stood at 49.5 per cent. This has led to a reduction of kerosene consumption from 892 crore litres in 2014-15 to 204 crore litres in 2020-21 – a reduction of more than 77%; and a reduction in CO2 emissions by 17.2 million tonnes per annum.

**2: Renewable Energy:** India's installed non-fossil fuel-based power generation capacity today stands at more than 218 GW, which equates to more than 46% share of total installed power generation capacity as of January, 2025.

- **National Hydrogen Energy Mission**: Prime Minister of India, on 15th August 2021, announced the launch of National Hydrogen Mission with a target to make India a global hub for production as well as exporting green hydrogen. The Ministry of New and Renewable Energy, Government of India has established a National Hydrogen Energy Mission to scale up green hydrogen production and utilization across multiple sectors. The mission supports development and commercialization of green hydrogen technologies with an aim to reduce dependence on imported fossil fuels and enable decarbonization of the economy. The mission has set a target to achieve a green hydrogen production capacity of at least 5 million metric tonnes per annum by 2030. The country is not on the right track to achieve its target by 2030 as most of the green hydrogen plants announced under the National Green Hydrogen Mission are still not functional.
- **High-efficiency solar PV modules**: The Union Cabinet approved the Production Linked Incentive (PLI) Scheme in November 2020 for high-efficiency solar PV modules to create additional solar PV manufacturing capacity by 2025. This Scheme incentivizes the domestic production of high-efficiency solar PV modules by providing financial incentives to manufacturers. According to Ministry of New and Renewable Energy's information, India has reached an annual PV module manufacturing capacity of about 63 GW. It's a remarkable achievement.
- **Sustainable Alternative towards Affordable Transportation**: The Government of India launched the Sustainable Alternative Towards Affordable Transportation (SATAT) initiative in October 2018 to promote compressed biogas (CBG) as an alternative green transport fuel. The initiative helps in efficient management of biomass and organic waste such as municipal waste, forest residues, and agri-waste including animal-husbandry and marine waste. It targets to set up 5000 CBG plants 2025. According to GOBARdhan portal only 1000 plants are functional today. It represents the country's underperformance regarding this target.
- **Sugarcane-derived ethanol:** The roadmap for sugarcane-derived ethanol blending in India 2020-25 was released on 5 June 2021. It initially aimed to achieve 20% ethanol blending in petrol by 2030. However, the target was preponed, and the government accelerated the timeline to 2025. India is promoting ethanol as an indigenous, non-polluting and virtually inexhaustible. The country has shown remarkable progress in this regard as it achieved 15% ethanol blending in late 2024 as compared to only 1.53% in 2014.
- **PM Surya Ghar: Muft Bijli Yojana**: The PM Surya Ghar: Muft Bijli Yojana, launched in 2024, played a crucial role in this expansion, facilitating 7 lakh rooftop solar installations within ten months.

**3: Efficiency**:

- **National Mission for Enhanced Energy Efficiency**: Implementation of the National Mission for Enhanced Energy Efficiency (NMEEE) in 2015 is one of the key components of the National Action Plan on Climate Change (NAPCC), focuses on achieving energy efficiency in all sectors of economy with substantial potential for improvement.
- **Perform, Achieve and Trade scheme**: Under this scheme, energy efficiency targets are set for industry. If they achieve higher efficiencies than their targets, they get Energy Savings Certificates (ESCerts) equivalent to the extra efficiencies generated. The ESCerts are purchased by industries falling short of their Energy Efficiency target in a particular year. These ESCerts are tradable on the Power exchange. The PAT scheme has resulted in energy savings of 23 Million Tonne of Oil Equivalent (MTOE) and accounted for emission reduction of 102 million tonnes of CO2 per annum.
- **Street Lighting National Program:** Under Street Lighting National Program (SLNP), India replacing all its streetlights with LED streetlights. Under the program, more than 12.18 million LED streetlights have been installed across India. This has resulted in an estimated energy savings of 8.18 billion kWh per year.
- **Star labels:** The Standards & Labelling (S&L) programme targets the display of energy performance labels ('Star labels') on select appliances and equipment, and lays down minimum energy performance standards. Starting with 10 appliances/ equipment in 2009, the programme now covers 28 appliances/equipment; over 15,000 models. This has resulted in reduction of CO2 emissions by 55.0 million tonnes per annum.
- **Energy Conservation Building Code:** The Government of India launched the Energy Conservation Building Code 2017 (ECBC) in June, 2017 for large commercial buildings with connected load of 100 kW and above or 120 kVA and above. Subsequently, the government also launched the Eco-Niwas Samhita 2018 (now Eco-Niwas Samhita 2021), to push for energy efficiency in the residential buildings.

**4: International Cooperation:**

- **International Solar Alliance:** India has established partnerships with countries like the US, Germany, and Japan to collaborate on clean energy research and technology development. It is a founding member of the International Solar Alliance (ISA), which was launched in 2015, by the Prime Minister of India and the President of France, which aims to promote solar energy deployment globally. Now it has more than 120 members, including developed countries, such as, the United States, Japan and Australia.
- **Foreign Direct Investment**: According to the information provided by the government agencies, India received a total Foreign Direct Investment (FDI) equity inflow of more than $6 billion in the renewable energy sector during financial years from 2020-21 to 2022-23, $3.76 billion in the financial year 2023-24, marking a 50% increase compared to the previous year and $1.24 billion in the first half of financial year 2024-25. Significant portion of the FDIs came from Singapore, Netherlands, the UK, the UAE, Japan and the US.

**5: Infrastructural development:** In 2014, India's installed renewable energy-generating capacity per capita was about 28 watts/person, which is increased to more than 143 watts/person in 2024, which indicates a remarkable infrastructural development in renewable energy sector.

## Conclusion

India has made significant strides towards achieving SDG 7, ensuring access to clean and affordable energy. Electrification efforts through DDUGJY and SAUBHAGYA have brought power to nearly all homes. Clean cooking initiatives like PMUY have improved health and empowered women. India's renewable energy capacity, especially solar and wind, has grown rapidly, exceeding 46% of total capacity, and is projected to reach 50% by 2030. Energy efficiency programs like PAT and SLNP have reduced energy consumption and emissions. International collaborations, such as the ISA, and significant FDI inflows have further boosted progress. While challenges remain, especially in green hydrogen and ensuring consistent progress across all areas, India is moving closer to its SDG 7 goals.

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