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YOJANA MAGAZINE ANALYSIS

(September 2024)

(Part 3/3)

TOPICS TO BE COVERED

PART 1/3

- PUBLIC FINANCE & DEVELOPMENT: EVALUATION OF INDIA'S BUDGETARY PRIORITIES
- INCLUSIVE HUMAN RESOURCE & DEVELOPMENT

PART 2/3

- RESILIENCE IN AGRICULTURE
- MANUFACTURING & SERVICES

PART 3/3

- INNOVATION RESEARCH & DEVELOPMENT
- ENERGY SECURITY

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INNOVATION, RESEARCH & DEVELOPMENT

The **Budget 2024-25** in the realm of science, technology, and innovation (STI) has **launched several initiatives reinforcing national commitment for Viksit Bharat 2047.**

The budgetary allocations for STI are supplemented by additional efforts for the institutionalisation of new initiatives and **ensuring private sector participation.**

Key Highlights of Budget 2024-25

- **Increased Allocation for Science, Technology, and Innovation (STI):**
 - The Ministry of Science and Technology received a **31% increase** in budget, totaling **₹16,628.12 crore**, compared to **₹12,701.63 crore** in 2023-24.
 - **Specific departmental increases:**
 - Department of Science and Technology (DST): **64% increase**
 - Department of Biotechnology (DBT): **42% increase.**

INSTITUTIONAL INITIATIVES

- **Anusandhan National Research Foundation (ANRF):**
 - Launched last year with a substantial allocation of **₹50,000 crore** for 2024-25.

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- **Allocation for the NRF (including ANRF) increased from ₹258.60 crore to ₹2,000 crore (a 673% increase).**
- **The NRF aims to establish a professional and comprehensive research framework, directing resources for coordinated research across disciplines in Indian universities, colleges, and research institutions.**
- **This initiative will support the Atal Innovation Mission, promoting a culture of innovation and entrepreneurship nationwide.**

NEW MISSION & INITIATIVES

- **Major New Initiatives:**

- **Critical Mineral Mission:** Aims to develop technology for **domestic production, recycling, and acquisition of critical minerals** to reduce dependency on imports.
- **India AI Mission:** Launched in **June 2024**, allocated **₹551.75 crore** to harness AI's potential for economic growth and social impact.
- **PM Surya Ghar Muft Bijli Yojana:** Promotes subsidized installation of **rooftop solar panels for 1 crore households**, providing free electricity for up to **300 units monthly**.

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- **Boost to Existing Schemes:**

- Enhanced funding for programs such as the **National Quantum Mission, Deep Ocean Mission, Cyber Security initiatives**, and more, aimed at enhancing competitiveness and sustainability in various sectors.

ROLE OF PRIVATE SECTOR

- **Support for R&D and Innovation:**

- **₹1 lakh crore** allocated to facilitate **private sector-driven research and innovation**, fostering a robust national S&T ecosystem.
- A capital expenditure (CAPEX) of **₹1,11,111 lakh crore** (approximately **3.4% of GDP**) to stimulate economic growth.
- Notably, **private CAPEX grew by 19.8%**, indicating a healthy investment climate and collaboration between public and private sectors.

FUTURE RESILIENCE & SUSTAINABILITY

- **Digital Infrastructure Enhancements:**

- Increased funding for the modernization of **land records, particularly through the Bhū-Aadhaar** initiative, aimed at improving land administration and **management in both rural and urban areas.**

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- This initiative will support the **digitization of land records and GIS mapping**, integrating with other digital services for better beneficiary identification.
- **Focus on Energy Security and Green Transition:**
 - The budget for the Ministry of Environment, Forests, and Climate Change increased to **₹3,330.37 crore**, focusing on **pollution control, education, and skill development**.
 - A **143% increase** in the Ministry of New and Renewable Energy's allocation, reaching **₹19,100 crore**, to support renewable energy projects, **particularly grid solar energy**.
 - Significant investments in electric vehicles and the **National Green Hydrogen Mission**, which saw an increase in funding to **₹600 crore**, underlining India's commitment to sustainable energy solutions.

HEALTH & AGRICULTURE INNOVATIONS

- **Healthcare Initiatives:**
 - The **National Institute for Research in Digital Health and Data Science (NIRDHDS)** received increased funding from **₹2,295 crore to ₹2,732 crore**.

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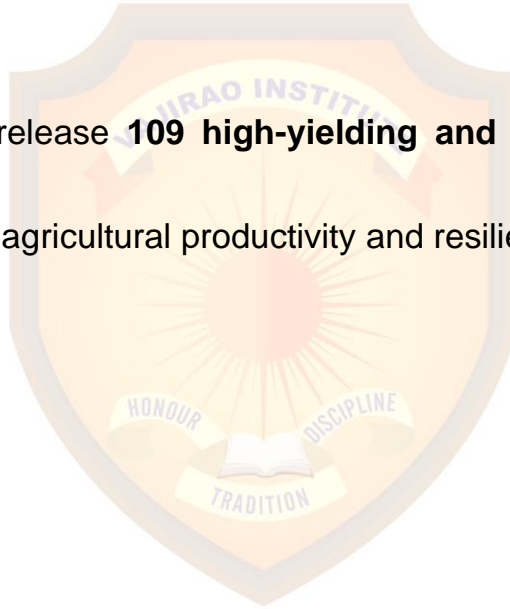


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- The Ministry of AYUSH's allocation increased by **23%**, reaching **₹3,712.49 crore**, enhancing programs like **AYURGYAN** and the **National Ayush Mission**.

- **Agricultural R&D Focus:**

- Budgetary allocation for agriculture R&D rose from **₹1,945 crore** to **₹2,145 crore**.
- Commitment to release **109 high-yielding and climate-resilient varieties** of crops to improve agricultural productivity and resilience.



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ENERGY SECURITY

The **International Energy Agency (IEA)** defines **energy security** as the **uninterrupted availability of energy sources at an affordable price**. This concept is a **critical driving force behind energy policy, especially in the context of limited resources**.

- A. The energy transition **must consider alternative demands to enhance resilience against climate change** and ensure sustained social and economic development.
- B. Energy security includes a **nation's ability to ensure a reliable, sustainable, and uninterrupted energy supply** to fulfill its economic, social, and political needs.

KEY OBJECTIVES OF INDIA'S NEW ENERGY POLICY

- **Access at Affordable Prices:** Ensuring that energy is economically accessible.
- **Improved Energy Security and Independence:** Reducing reliance on foreign energy sources.
- **Greater Sustainability:** Prioritizing environmentally friendly energy solutions.
- **Economic Growth:** Supporting growth through stable energy availability.

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INDIA'S CURRENT ENERGY LANDSCAPE

India's energy needs are heavily reliant on imports. According to the **Economic Survey 2023-24**, India's energy demands are anticipated to grow by **2 to 2.5 times by 2047** to support a burgeoning economy.

Key points regarding energy security include:

- **Fossil Fuel Dependence:** Fossil fuels constitute **90%** of India's commercial primary energy supply, primarily sourced through imports.
- **Investment Estimates:** The **NITI Aayog** projects that India will require an annual investment of **US\$250 billion** until 2047 to transition to net-zero energy pathways.

BUDGET 2024-25 MEASURES

The **Union Budget 2024-25** presents several strategic initiatives to bolster energy security:

- **Collaboration on Nuclear Technology:** The government will partner with the private sector to advance research and development for **Bharat Small Modular Reactors** and establish these reactors.
- **Pumped Storage Projects:** Introduction of a policy promoting pumped storage systems, which will enhance the integration of renewable energy and manage its variable nature effectively.

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- **Joint Venture for Advanced Power Generation:** A collaboration between **NTPC Limited** and **Bharat Heavy Electricals Limited (BHEL)** to develop an **800 MW commercial plant** using advanced ultra-supercritical technology.
- **PM Surya Ghar Muft Bijli Yojana:** Launched to facilitate the installation of rooftop solar panels, enabling **1 crore households** to receive free electricity for up to 300 units monthly. The initiative has seen over **1.28 crore household registrations** and **14 lakh applications**.

BUDGETARY ALLOCATIONS

The budget exercise outlines economic policy measures and allocates funding across various ministries:

- **Ministry of Non-Renewable Energy (MNRE):** Allocated **₹19,100 crore**, marking an **86.7% increase** from **₹10,222 crore** in the previous year.
- **Ministry of Power:** Budgeted at **₹20,502 crore**, slightly down from **₹20,671 crore** in 2023-24.
- **Ministry of Coal:** Allocated **₹192.58 crore**, showing a marginal increase.
- **Ministry of Petroleum and Natural Gas:** Substantial reduction to **₹15,930.26 crore** from **₹41,007.72 crore**.

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MAJOR SCHEMES

- **Solar Power Off-Grid Scheme:** Increased funding to **₹1,000.35 crore** for solar power packs under Phase 3 implementation.
- **PM KUSUM Scheme:** Budgeted at **₹1,496 crore**, down from **₹1,996.46 crore** in the previous year, aimed at supporting farmers with renewable energy.
- **Green Energy Corridor Scheme:** Allocated **₹600 crore** for capacity addition of **6,000 circuit kilometers** of transmission infrastructure.
- **National Green Hydrogen Mission:** Increased funding to **₹600 crore**, reflecting a commitment to green hydrogen development.

CURRENT ENERGY USE CHARACTERISTICS

India's energy use is characterized by:

- **High Biomass Utilization:** A significant share of total primary energy supply comes from biomass.
- **Petroleum Imports:** Over **85%** of petroleum is imported, posing risks due to price volatility.
- **Coal Dependency:** Accounts for about **55%** of electricity generation. Coal is also critical for various industries like steel and cement.

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As of June 2024, **54.5%** of power was sourced from thermal methods (**coal, gas, and diesel**), while **45.5%** came from non-fossil fuel sources, including **1.8%** from nuclear energy.

Notably, India has exceeded its Paris Agreement target to generate 40% of power capacity from non-fossil fuel sources.

POLICY INITIATIVES FOR RENEWABLE ENERGY

Recent government efforts to enhance RE production include:

1. **PM-Surya Ghar Muft Bijli Yojana:** Aiming for an additional **30 GW** of solar capacity and significantly reducing carbon emissions.
2. **National Offshore Wind Energy Policy:** Establishing regulations to harness offshore wind potential.
3. **Indian Green Hydrogen Mission:** Targeting production of **5 million metric tonnes** of green hydrogen by 2030, with incentives for electrolyser manufacturing and production.

Additional policies focus on enhancing renewable energy storage through a **Pumped Storage Policy** and establishing a framework for transitioning hard-to-abate industries from energy efficiency targets to emission targets.

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CHALLENGES TO INDIA'S ENERGY SECURITY

Challenges facing India's energy security include:

- **Increased Demand:** Economic development leads to rising energy needs alongside growing RE capacity, potentially affecting efficiency.
- **Intermittency of Renewable Energy:** The variable nature of renewable energy sources necessitates solutions to ensure reliability.
- **Land and Water Availability:** Expanding renewable energy infrastructure will increase demands on these critical resources.
- **Dependency on Critical Minerals:** High reliance on imports for essential minerals needed for RE technologies poses supply chain risks.

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