Ten Years After Paris: Transition Outlook INDIA

Emissions trajectory since Paris Agreement

Emissions continue to rise, but GHG intensity fell 36% by 2020 vs. 2005, placing India on track toward its 45% reduction target by 2030.

Progress

Energy system transformation shows some momentum, with an increasing share of renewables in electricity capacity

While coal still plays a central role in meeting demand, share of renewable sources in the energy mix has increased consistently. **Total installed capacity grew from around 305 GW (2015–16) to 475 GW (2024–25), with renewable sources reaching almost 50% of installed electricity capacity in 2025**, 5 years before the 2030 NDC target. Grid infrastructure is being gradually expanded and strengthened.

Decoupling economic growth from emissions intensity

GHG emissions intensity of GDP was reduced by 36% by 2020 compared to 2005, placing India on track toward its 45% NDC target (2030). With rising demand and critical development needs, total emissions in India continue to rise, however emissions growth has remained slower than GDP growth, reflecting some structural efficiency shifts.

Strengthening of coordinated climate governance around long-term objectives since the Paris Agreement

The **Indian LT-LEDS**, submitted to UNFCCC in 2022, was produced by a **multi-ministerial task force** involving all ministerial authorities in charge of relevant sectors. Throughout its development phase, consultations were held with sub-national governments, civil society organizations, academia, and private sector representatives. Climate objectives are increasingly integrated across sectoral policies, and planning instruments, providing a coordinated framework for long-term transition.

Enablers

Long-term perspective integrated in national climate policy-making through alignment of NDC and LT-LEDS

India's updated NDC and LT-LEDS combine short-term targets with a long-term decarbonization strategy towards a net-zero target by 2070. **This alignment aims at linking climate and development priorities in electricity, industry, transport, buildings, and lifestyle-based mitigation** under a single strategic framework.

Scale-up of national policies and regulations aligned with short-term action and long-term goals

Since 2015, India has introduced over **650 national and sub-national policies directly or indirectly supporting its net-zero target.** These include targeted measures on renewables, energy efficiency, electrification and clean fuels. Key mechanisms include production-linked incentives for solar PV and batteries, solar parks, wind repowering and energy storage obligations. Grid improvements have significantly lowered technical and commercial losses.

Integration of economic development and climate objectives

India's transition approach emphasizes **co-benefits for energy access, affordability, air quality, and green jobs**. National initiatives such as Mission LiFE, the National Green Hydrogen Mission, and clean cooking and efficiency programs embed climate action within broader development priorities.

Main Transformations Needed in Key Sectors

Low-carbon transition of the energy sector

To achieve net-zero, a **just and sustainable long-term transition out of coal will be necessary**, with continued renewables expansion and reduction of technological uncertainties for storage solutions. Challenges include optimization of grid infrastructure, consolidation of inter-state transmission systems and flexible generation to support rising demand and reliability of the energy system.

Further development and penetration of bioethanol

The transition towards clean fuels in transportation requires a c**lear and detailed long-term vision that builds beyond its current (20%) and projected (27%) ethanol blending threshold by 2030**. Initial 2030 target was achieved in 2025, suggesting ample margin for higher sectoral ambition in view of the 2070 net-zero target.

Transport electrification and modal shift in freight

Scaling vehicle electrification, accelerating rail and waterway freight shifts and aligning urban planning with low-carbon mobility will be key to decarbonize transport.

Transition of hard-to-abate industries

Early-stage investment, large-scale infrastructure and upgrades in efficiency will be required for clean industrial processes to expand. Establishment of a **green hydrogen market** through policies and infrastructure development would help bring down capital costs for such resource.

Buildings and behavioral changes

Expansion of **energy efficiency codes, appliance standards, and demand-side measures** will be key to ensure energy efficiency in buildings, coupled with behavioral change initiatives spearheaded by the Government's **Mission LiFE**.

Barriers

Rising energy demand and continued coal dependence

Against a backdrop of fast-growing electricity demand and industrial activity, **coal still remains central to India's energy system**, accounting for nearly 44% of installed power capacity in 2025. It is projected to remain significant through the 2030s.

High investment needs and financing constraints

Achieving long-term climate targets will require sustained capital flows. Estimates suggest that **USD160 billion/year will be required in energy sector investments through 2030.** Climate finance needs will continue to climb, as systemic changes become more urgent.

Uneven implementation of energy transition policies across sectors and sub-national states

National governance provides a unified policy framework, but **implementation progress is highly uneven across sectors and regions.** Infrastructure gaps, grid integration constraints, and stark sub-national capacity gaps affect the speed and consistency of delivery.

Check the full India chapter from the DDP 2025 Report