

Indo-German Energy Programme: Energy Transition with DISCOMs

Promoting India's energy transition in collaboration with electricity supply companies

Context

The energy landscape in India is presently undergoing a significant transformation with the aim of reducing its reliance on fossil fuels and shifting towards a more sustainable and renewable energy-oriented system. The Government of India has set an ambitious target of achieving 500 GW of energy generation capacity from non-fossil fuel sources by 2030. This goal presents a substantial opportunity for the country to meet its energy needs while lowering its carbon emissions at the same time.

Central to this energy revolution are the Electricity Distribution Companies (DISCOMs), which play a crucial role in distributing and vending electricity across various states in India. Their responsibility of ensuring a reliable and affordable electricity supply is of utmost importance, positioning them as key catalysts in the country's transition to cleaner energy sources. DISCOMs in India are facing various challenges, including financial distress, high aggregate technical and commercial losses, inadequate infrastructure, regulatory complexities, and power theft. Despite initiatives like *Ujwal DISCOM Assurance Yojana* (UDAY) bringing about progress, the challenges persist, as Aggregate Technical and Commercial (AT&C) losses continue to be 17%. The world average is currently at 5%, thereby highlighting the potential for improvement.

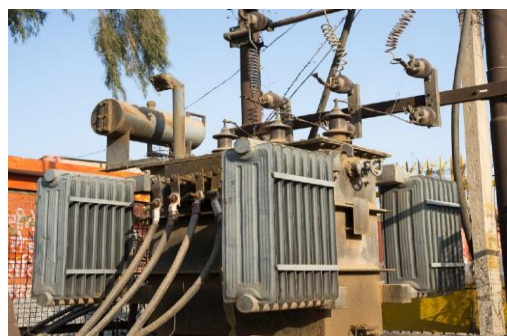
These challenges go beyond mere financial losses, encompassing suboptimal maintenance practices that lead to technical losses and compromised power supply quality. The absence of robust standards for efficiently managing distribution grid assets poses a risk to investment security. The need for a digital registry and proactive maintenance practices is evident. As the adoption of solar rooftop installations and electric vehicles accelerates, the complexities associated with network management grow. This underscores the demand for digital solutions in load forecasting and flexibility optimisation.

In response to these issues, the Ministry of Power (MoP), Government of India has introduced the Revamped Distribution Sector Scheme (RDSS) aimed at improving operational efficiency and financial sustainability of DISCOMs. This effort is supported by the Indo-German development cooperation project 'Energy transition with distribution companies (DISCOMs)' that the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH implements on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). This project falls within the broader framework of the Indo-German Energy Programme. It is designed to assist the Ministry of Power in establishing a sturdy, technologically advanced, economically sustainable, socially equitable, and environmentally conscious energy distribution system by providing technical support to DISCOMs.

Project name	Energy transition with distribution companies (DISCOMs)
Commissioned by	Federal Ministry for Economic Cooperation and Development (BMZ)
Project region	India
Lead executing agency	Ministry of Power, Government of India
Duration	2020 – 2025

Our approach

At its core, the project involves aspects of enhancing distribution network planning, data analysis, operation, maintenance, and capacity building. A significant emphasis is placed on seamlessly integrating Distributed Renewable Energy (DRE) sources into the distribution grid while promoting load-side flexibility through demand response mechanisms. Additionally, the project is dedicated to developing tools for processing and analysing this data, thereby fostering data-driven decision-making processes.



Description: On the left are 11 kV electricity lines; On the right is the distribution transformer visited during a study on condition monitoring.

Objective

The conditions for the implementation of the Indian energy system transformation by distribution utilities have improved.

Focus Areas

- Distribution Reforms
- Distribution Asset Management/Operation & Maintenance (O&M)
- Innovative technologies, digitalisation, and data analytics in the distribution sector
- DER Integration and demand response
- Training and capacity building for DISCOMs

Key Stakeholders

The project works with the Ministry of Power (MoP), Central Electricity Authority (CEA), Power Finance Corporation (PFC), and selected DISCOMs in India.

Key activities

- Compilation of pilot measure experiences and pertinent insights from selected DISCOMs.
- Analysis of the current relevant regulations on data analysis, data processing, operation, and maintenance of distribution networks at state and national level.
- Preparation of a proposal to adapt the regulatory framework as a basis for the public consultation process.
- Identification and grouping of possible power consumers with potential for load shifting or energy efficiency (load reduction).
- Description of the economic benefits for electricity consumers and utilities as well as development of suitable business models through a multi-stakeholder dialogue.

- Pilot testing of selected technical innovations and business models and processing of the experience into concrete recommendations for action.
- Integration of Renewable Energy (RE) and Electric Vehicles (EV) in the distribution network.
- Selection of suitable DISCOMs for the implementation of pilot measures with dissemination potential.
- Development of a future scenario for energy supply companies for the safe operation of their distribution network with increasing penetration of RE and EV.
- Analysis of education and training practices and teaching content on distribution networks.
- Organisation of conferences/workshops and study trips for DISCOMs on digital data analysis, data processing, operation, and maintenance of distribution networks.
- Piloting and national dissemination of selected measures of the training concept.

Outcome

The programme assists the Ministry of Power in building up a broad-based, technically, and economically efficient, socially, and ecologically sustainable energy supply by supporting the DISCOMs. The project aims to:

- Developing the regulatory framework for digitalisation and operation & maintenance of distribution networks.
- Enhancing the conditions for flexible load control of power consumers by demand response or demand side management.
- Implementing pilots on data analysis, data processing, operation & maintenance, and on operation of the distribution grid with an increasing share of decentralised renewable energy / electric vehicles.
- Training DISCOM personnels to improve their technical skills in digital data analysis, data processing, operation, and maintenance of distribution networks. This also includes supplementing the training curricula of DISCOMs.

Published by

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
Registered offices Bonn and Eschborn, Germany

IGEN-Energy Transition with DISCOMs
B-5/2, 4th Floor, Safdarjung Enclave,
New Delhi 110029
Phone +49 (0)00 123 456 789
Fax +49 (0)00 123 456 789
www.giz.de/India

As of

August 2023

Responsible

Sunil Kumar Sharma, Project Head
sunil.sharma@giz.de

GIZ is responsible for the content of this publication.

On behalf of

Federal Ministry for Economic
Cooperation and Development (BMZ)

In cooperation with



GOVERNMENT OF INDIA
MINISTRY OF POWER