



ITES

Part of the **UK-India** Net Zero
Innovation Virtual Centre

Net Zero Challenge Assessment Tool



Insights

April 2024



Introduction

- India has emerged as a strong supporter of global decarbonisation efforts to achieve Net Zero. The Indian government has launched various initiatives and decarbonisation policies to **reach Net Zero by 2070**.
- These policies led to an expansion of renewable energy sources and an increase in the electrification of transport, which presented **new challenges** to the electricity grid.
- The Net Zero Challenge Assessment Tool (NCAT) was developed as part of Innovating for Transport and Energy Systems (ITES) to **explore the challenges** associated with decarbonising India's energy and transport sectors.
- The results and findings from NCAT use in India were aggregated and presented in the later slides to offer **insights into the Indian Distribution companies (DISCOMS) networks** and their decarbonisation challenges.

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About Innovating for Transport and Energy Systems (ITES)



- Innovating for Transport and Energy Systems (ITES) is a landmark government-backed collaboration designed to drive Net Zero innovation, drastically reduce emissions, and deliver better futures in the UK and India.
- Led by Energy Systems Catapult and the Indian Institute of Science, ITES forms part of a landmark Memorandum of Understanding between the UK and India to deepen collaboration on science and innovation.
- Funded by Innovate UK and the UK's Department for Science, Innovation and Technology, ITES works across UK-India industry, academia, and government to turn innovations into world-first solutions for a cleaner future.

Find us:

ITES website:
<https://ites.org/>

Energy Systems Catapult
website:
<https://es.catapult.org.uk/tools-and-labs/innovating-for-transport-and-energy-systems/>

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About Net Zero Challenge Assessment Tool (NCAT)

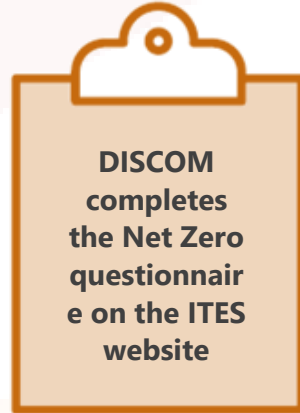


Net Zero Challenge Assessment Tool (NCAT) is an online tool that aims to deliver an assessment on the current state of Indian Distribution Companies (DISCOMS) and assist them in reaching Net Zero goals

- NCAT outcome and insights are useful for SMEs and Innovators interested in entering new markets and bringing UK innovation to India.
- NCAT removes the need for initial outreach by DISCOMS. And showcases the capabilities of Energy Systems Catapult and what we can do to support DISCOMS to deliver their Net Zero goals.
- NCAT was live tested in India to survey a few targeted DISCOMS. The total outcome was aggregated to provide a total assessment of the targeted DISCOMS networks.

NCAT at a Glance

NCAT Questionnaire



The DISCOM fills the NCAT questionnaire on an online form.

The questionnaire is the first-level interface with ITES and the Catapult. It removes the need for initial outreach by the DISCOMs .

Whole System Analysis



The form response is recorded and saved online.

The backend of the tool analyses the given information by assigning a specified score to each answer and calculating the results.

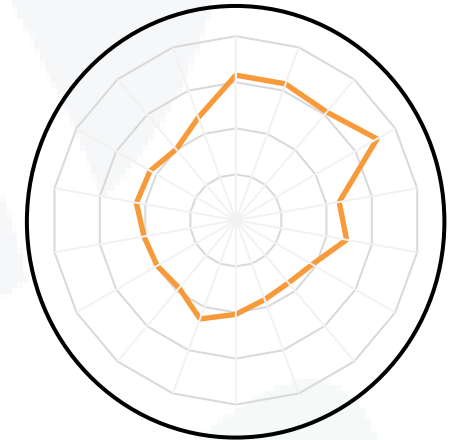
Capability Match



The responses are matched to the main focus areas.

The main focus areas are derived from the Catapult capabilities. The backend of the tool matches the DISCOM's needs to the capabilities.

Net Zero Assessment



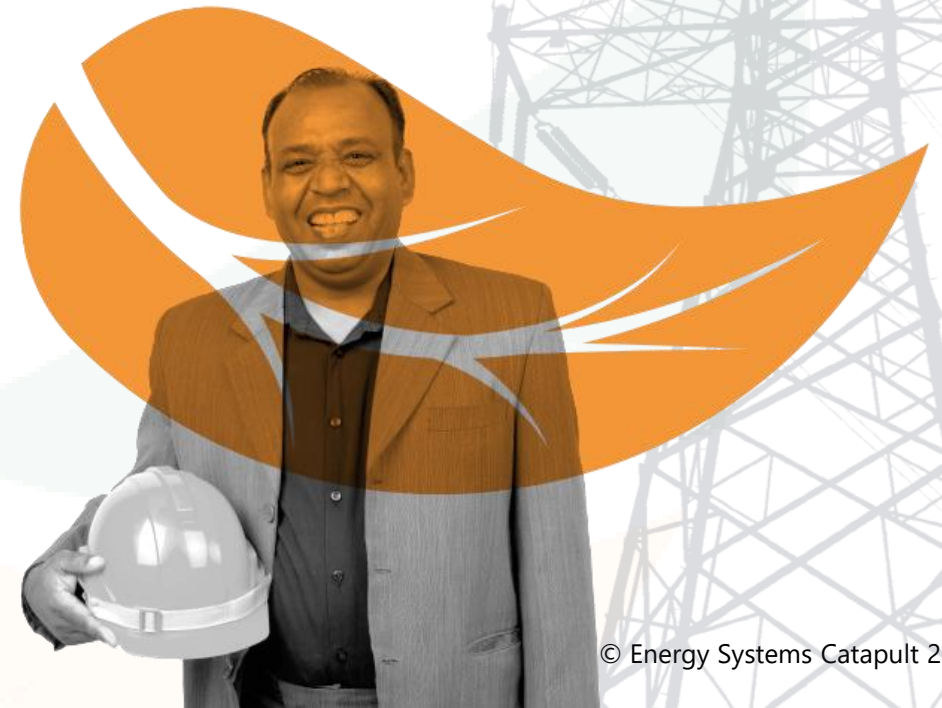
NCAT produces the Net Zero assessment results.

The results highlight the current state of DISCOM's network and the challenge areas (gaps) to assist them in reaching Net Zero goals.

About Indian Distribution Companies (DISCOMs)



- There are more than 70 distribution companies (DISCOMs) in India. They vary in ownership structure, e.g., public, privately owned or partially funded (by the state government).
- DISCOMs play a crucial role in supporting the Indian government's Net Zero targets.
- DISCOMs are responsible of managing all aspects of the electricity grid in their network areas, and they have direct access to the consumers.
- DISCOMs must be notified of any installations that affect their network capacity for load allocation and to ensure safe and reliable connections (e.g., EV charger installations and roof-top solar).

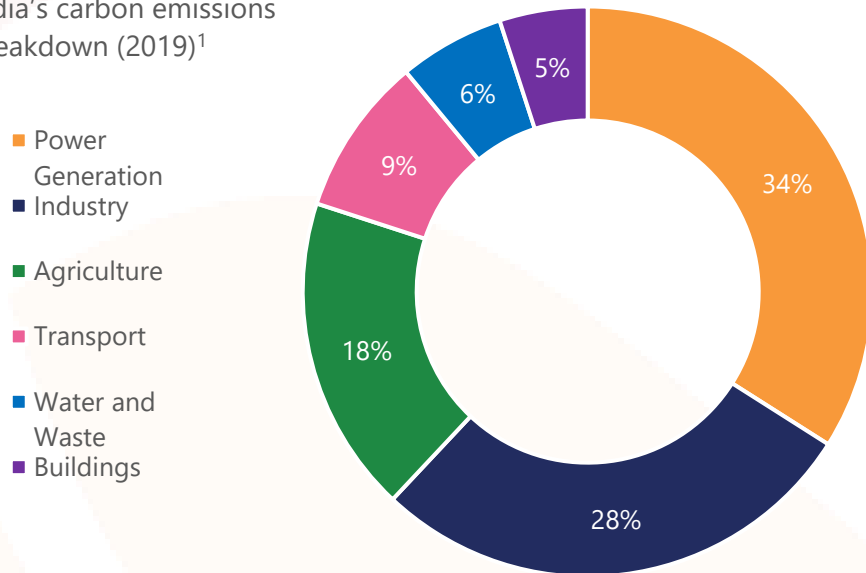


The Challenge – Decarbonising India



- The power generation and transport sectors are among the top contributors of India’s total carbon emissions.

India’s carbon emissions breakdown (2019)¹



- India has made significant progress towards achieving its Net Zero by promoting clean energy alternatives such as renewable energy generation and EV adoption.
- These changes come with new and unique challenges. The Indian DISCOMs are exploring various solutions and strategies to decarbonise and reinforce their network.
- Clean energy development in India, particularly in the electricity and transport sectors, offers numerous opportunities for innovators, organisations and SMEs to apply their expertise and bring innovative solutions to India.

Insights



Use of NCAT with Indian DISCOMs provided key insights into challenges and opportunities in the Indian Distribution Networks that ITES, the Catapult and the UK SMEs can support



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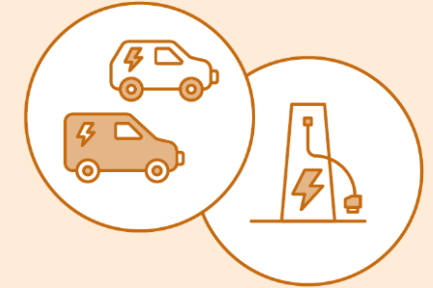
Strategic Whole System Thinking

- The lack of long-term deployment strategies to meet the Net Zero target declared by India is a key challenge for the DISCOMs.
- Significant interest in strategic whole systems support to facilitate the transition to Net Zero technologies.



Renewable Energy Growth

- The extensive support schemes available for distributed energy resources such as roof-top solar are driving India's renewable energy growth.
- SMEs specialising in energy storage and delivery have great opportunities to offer expertise in this area.



EV and EV Support Schemes

- EV green support schemes are offered in most states, yet they are limited to financing. There are concerns regarding system stability over widespread adoption of EVs.
- Opportunities for SMEs offering services in planning and installing charging infrastructure and EV charging management systems.

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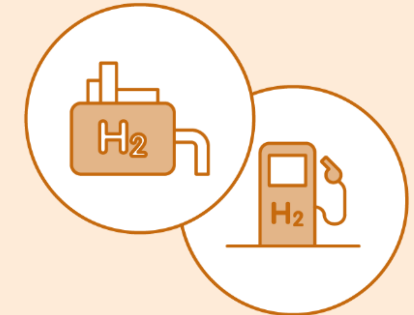
Grid Operations

- High line-loading and losses is one of the most concerning challenges faced by the DISCOMs in grid operations.
- This challenge area could benefit from specialised power system expertise in loss prevention and network reinforcements.



Consumers & Flexibility

- Consumer adoption of new products and services has been positive in the past. The consumer base could participate in flexibility services if incentivised to regulate energy consumption.
- SMEs specialising in smart metering and intelligent grid services can offer expertise in this market.



Hydrogen

- Most DISCOMs expect hydrogen to play a role in decarbonisation, yet currently, no strategic plans are in place. The hydrogen areas of interest are generation, long-term storage for system backup, and transport.
- SMEs specialising in hydrogen and storage have great opportunities to enter this emerging market.



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For more information, please contact us:



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