

LOW CARBON PATHWAYS THROUGH **DEMAND SIDE MANAGEMENT**



THE ENERGY AND
RESOURCES INSTITUTE

Creating Innovative Solutions for a Sustainable Future

BACKGROUND

Rapidly growing power demand with changing patterns of power consumption, a growing share of renewable energy with a view to minimize greenhouse gas (GHG) emissions, promotion of e-mobility and, consumers turning into prosumer etc., pose multidimensional challenges to utilities to ensure demand–supply balance at all points in time and provide 24X7 supply to all while maintaining the requisite level of quality and reliability at affordable prices. A well-designed demand side management (DSM) action plan based on comprehensive load research and judicious deployment of emerging technologies assume relevance in this context, besides the requisite policy and regulatory support. Distribution companies (DISCOMs) play a key role in the design and implementation of the plans. Enhancing energy efficiency helps in meeting the rising demand by reducing the demand-supply gap without sacrificing the greater critical of inclusive growth.



DEMAND SIDE MANAGEMENT- A WIN-WIN OPTION

UTILITY

- Mitigate peak & energy shortages
- Conserve scarce conventional energy resources and reduce GHG emissions
- Savings in power purchase cost

CONSUMERS

- Savings in monthly electricity bills
- Improved reliability in power supply
- Better Quality of Living for residential consumers
- Societal benefits
- Potential to improve Human Development Index

GOVERNMENT

- Improved power supply position
Reduction in power shortages
- Growth in gross domestic product (GDP) due to better power supply

MANUFACTURERS

- Increase in sale of EE appliances
- Sustainability reporting
- Brand building



TERI's EXPERTISE IN DSM

1

Load research: A study of characteristics of electric loads to provide a thorough and evidence based knowledge of trends, and general behaviour of the load characteristics of the customers serviced by the Discom and identification of DSM and energy efficiency (EE) potential.

2

DSM action plan: Identification of potential interventions and selection of implementation models to be adopted at the consumer end of a specific utility on the basis of load research.

3

Regulatory support: Preparation of DSM programme documents by including institutional, financial, and communication strategies with detailed business models for implementation, cost-benefit analysis, and monitoring and verification (M&V) techniques.

4

Implementation support: Hand holding support to Discoms to implement DSM action plan.

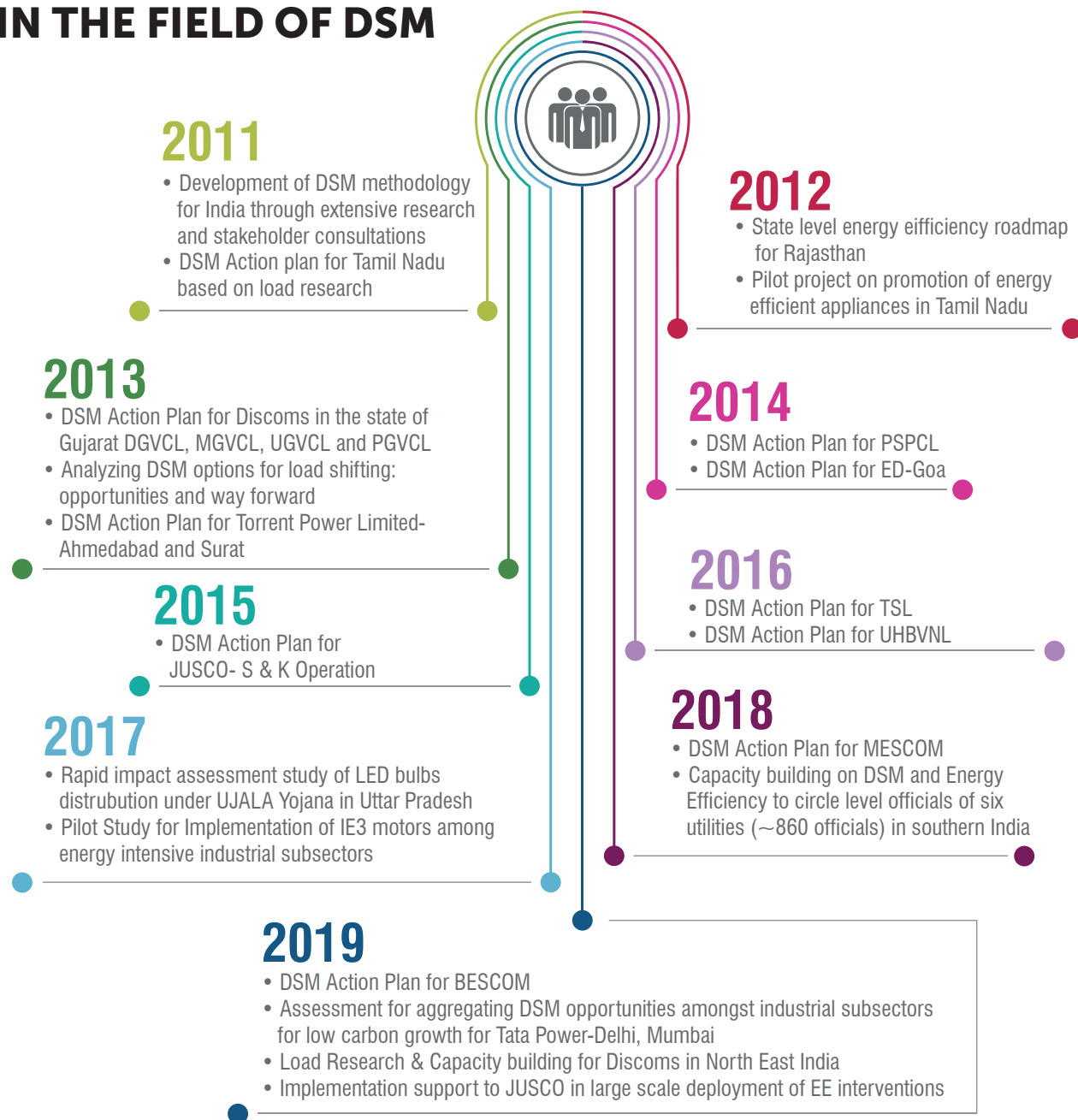
5

Capacity building: Knowledge transfer to utility, government & regulatory officials, implementing agencies and end use consumers, entrepreneurs, government officials, financial institutions and investors, civil society, and academia.

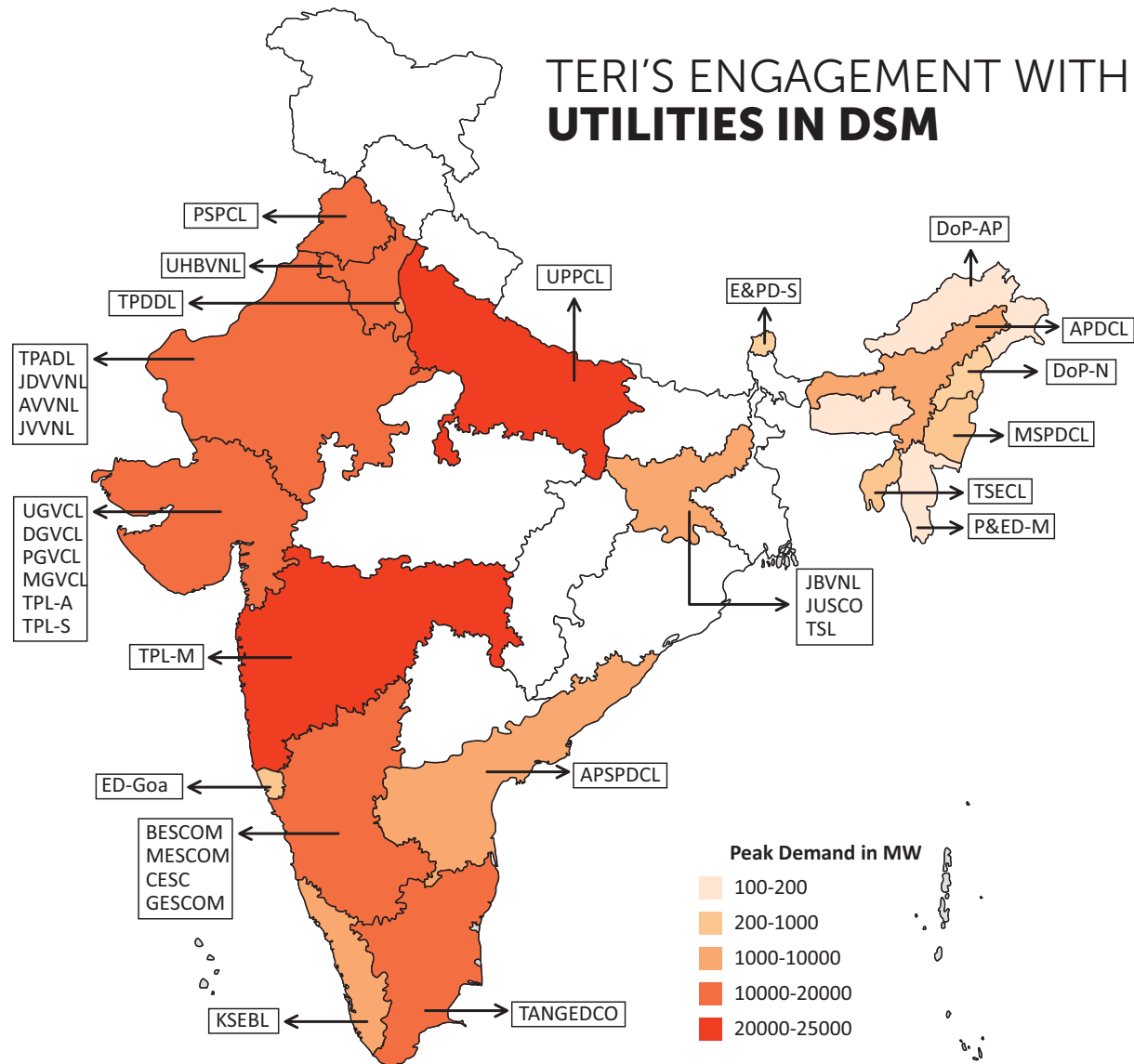
6

Impact assessment: Post implementation assessment including monitoring, measurement, and verification.

MILESTONES IN TERI'S JOURNEY IN THE FIELD OF DSM



TERI'S ENGAGEMENT WITH UTILITIES IN DSM



PSPCL Punjab State Power Corporation Ltd.
 UHBVNL Uttar Haryana Bijli Vitran Nigam
 TPDDL Tata Power Delhi Distribution Ltd.
 TPADL Tata Power Ajmer Distribution Ltd.
 JDVVNL Jodhpur Vidyut Vitran Nigam Ltd.
 AVVNL Ajmer Vidyut Vitran Nigam Ltd.
 JVVNL Jaipur Vidyut Vitran Nigam Ltd.
 UGVCL Uttar Gujarat Vij Company Ltd.
 DGVCL Dakshin Gujarat Vij Company Ltd.
 PGVCL Paschim Gujarat Vij Company Ltd.
 MGVCL Madhya Gujarat Vij Company Ltd.
 TPL-A Torrent Power Limited- Ahmedabad

TPL-S Torrent Power Limited- Surat
 TPL-M Tata Power Limited- Mumbai
 ED-GOIA Electricity Department-Goa
 BESCOM Bangalore Electricity supply company Ltd.
 MESCOM Mangalore Electricity supply company Ltd.
 CESC Chamundeshwari Electricity Supply Corporation
 GESCOM Gulbarga Electricity Supply Company Ltd.
 KSEBL Kerala State Electricity Board Ltd.
 TANGEDCO Tamil Nadu Generation and Distribution Corporation Ltd.
 APSPDCL Southern Power Distribution Company of Andhra Pradesh Ltd.

JBVNL Jharkhand Bijli Vitran Nigam Ltd.
 JUSCO Jamshedpur Utility Services Company Ltd.
 TSL Tata Steel Ltd.
 TSECL Tripura State Electricity Corporation Ltd.
 P&ED-M Power & Electricity Department-Mizoram
 MSPDCL Manipur State Power Distribution Company Ltd.
 DoP-N Department of Power-Nagaland
 APDCL Assam Power Distribution Company Ltd.
 DoP-AP Department of Power-Arunachal Pradesh
 E&PD-S Energy & Power Department, Government of Sikkim
 UPPCL Uttar Pradesh Power Corporation Ltd.

MAJOR INTERVENTIONS IDENTIFIED IN DSM



RESIDENTIAL

- Replacement of existing illuminations with energy- efficient LED Lights
- Adoption of energy-efficient space conditioning through Super energy efficient ceiling fans and 5 star rated air conditioners
- Awareness campaigns for consumers in regard to benefits energy conservation and adoption of energy-efficient appliances
- Promotion of self sustainable buildings concept through solar rooftop power plants and solar water heating system



INDUSTRY

- Cluster-based energy audits and adoption of cluster-specific interventions
- Power factor improvement and adoption of Time of Day Tariff
- Deployment of dynamic load management through demand response
- Promotion of energy-efficient equipments, such as motor, compressor, etc.
- Employee training and development of Best Operating practices (BOP) manuals



AGRICULTURE

- Promotion of energy-efficient agriculture pump sets
- Awareness and capacity building on best operating practices and energy-efficient irrigation methods
- Promotion of solar-based irrigation pump sets



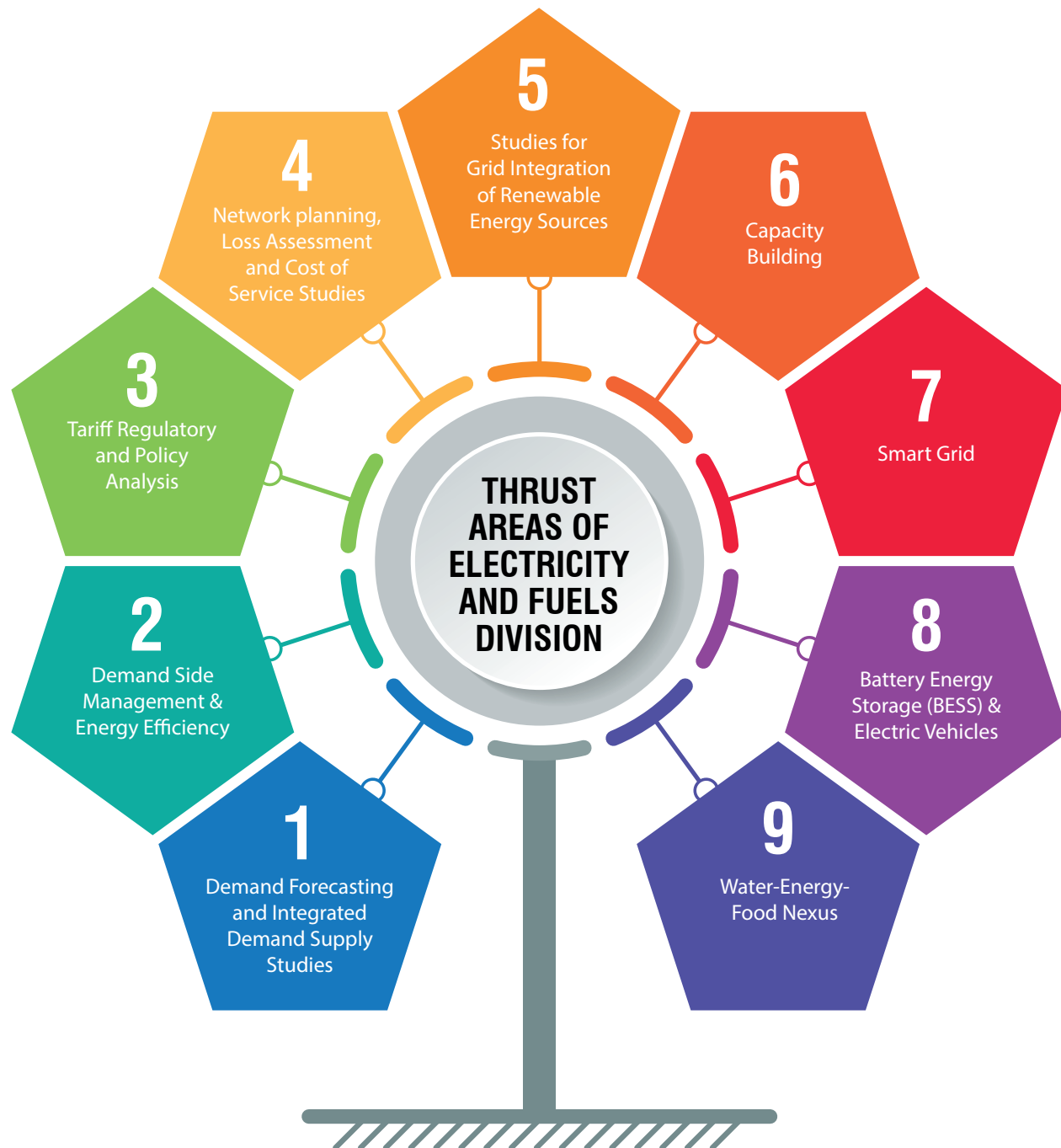
COMMERCIAL

- Adoption of energy efficient illumination technologies like LED, induction lamp and solar lamp
- Promotion of improved space conditioning through energy efficient chillers and passive cooling techniques
- Adoption of thermal energy storage systems
- Promotion of Energy Conservation Building Code
- Adoption of solar rooftop systems



MUNICIPALITY

- Replacement of existing inefficient street lights with energy-efficient LED street lights
- Regular municipal water pump audit
- Replacement of inefficient water pumps with industry grade energy-efficient IE3 motors.
- Promotion of energy efficient government buildings



ELECTRICITY AND FUELS DIVISION (EFD)

TERI envisions an India whose overall socio-economic development is driven by clean energy along a low-carbon pathway. Building on its nearly three decades of experience in developing and promoting clean energy solutions in various sectors of the economy in India and other developing nations, the division's efforts feed into policy-making levels of government, thereby creating a virtuous cycle wherein supportive policies are framed to encourage, and ensure, the large-scale adoption of clean energy solutions. EFD in TERI possesses rich and varied experience in the electricity/energy sector in India and abroad, and has been providing assistance on a range of activities to public, private, and international clients. It offers invaluable expertise in the fields of power, coal, and hydrocarbons and has extensive experience on regulatory and tariff issues and policy and institutional issues. TERI has been closely working with utilities, regulatory commissions, central & state governments, bilateral and multilateral organizations (The World Bank, European Union, GIZ, ADB, JBIC, DFID, USAID, NEDO, IEEJ, ECCJ, SDC, etc.).

ABOUT TERI

The Energy and Resources Institute (TERI) is a leading think tank dedicated to conducting research in the areas of energy, environment and sustainable development. TERI was established in 1974 as an information centre on energy issues. Over the following decades, it evolved into a research institute, whose policy and technology solutions transformed people's lives and the environment. TERI's key focus lies in promoting:



ENERGY



AGRICULTURE



ENVIRONMENT



HABITAT



RESOURCE
SECURITY



CLIMATE



HEALTH
& NUTRITION



Research and outreach
activities in over 50 countries

For queries, please contact

Mr Girish Sethi

Senior Director,
Industrial Energy Efficiency
Email: girishs@teri.res.in

Mr A K Saxena

Senior Director,
Electricity & Fuels Group
Email: ak.saxena@teri.res.in



The Energy and Resources Institute

Darbari Seth Block, IHC Complex,
Lodhi Road, New Delhi-110 003,

Tel. 2468 2100 or 2468 2111,

Fax: 2468 2144 or 2468 2145,

India +91 • Delhi (0)11

Website: www.teriin.org