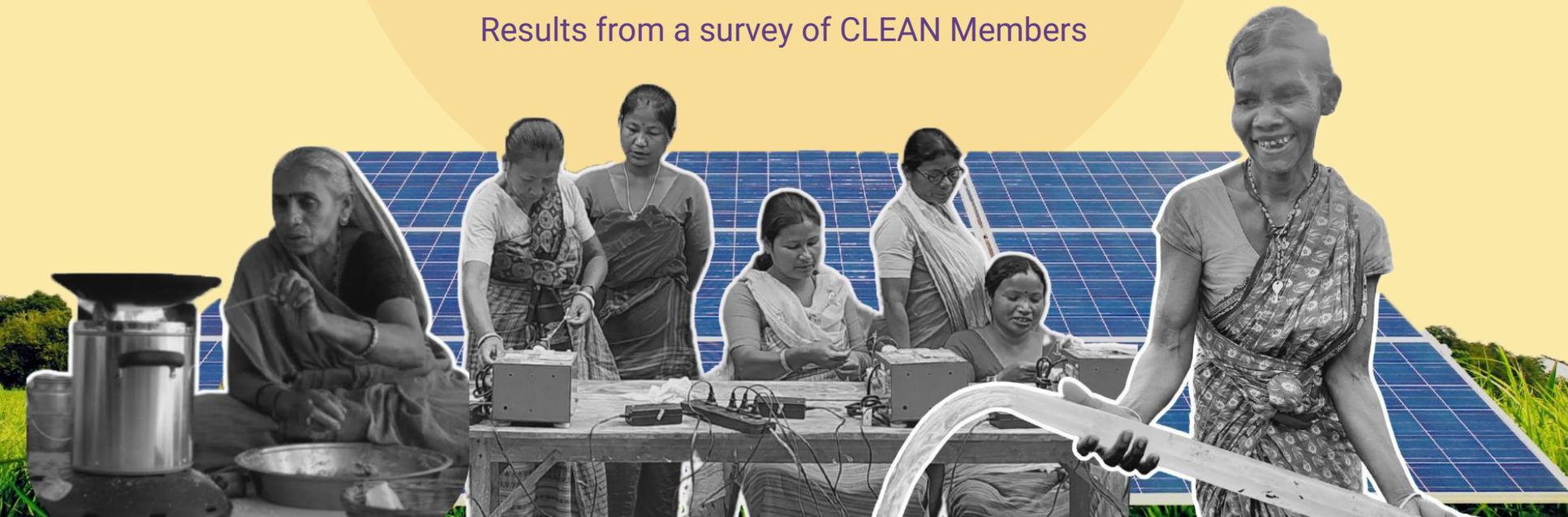




State of the DRE Sector

FY 2024-2025

Results from a survey of CLEAN Members



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Disclaimer

The views/analysis expressed in this report do not necessarily reflect the views of CLEAN and also does not guarantee the accuracy of any data included in this publication nor does it accept any responsibility for the consequences of its use.

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Message from the Executive Director, AREAS

The decentralized renewable energy (DRE) sector in India has been continuously evolving over the past four decades. From its early role in the 1980s—focused on improving quality of life through basic services such as lighting and clean cooking in remote and marginalised communities—DRE has gradually emerged as a driver of economic prosperity in rural areas since the 2010s. In recent years, it has also become an important component of India's response to climate change and sustainable development.

The Ministry of New and Renewable Energy has played a critical role in this journey through sustained policy and financial support. Present flagship schemes such as PM-Surya Ghar: Muft Bijli Yojana and PM-KUSUM have created strong momentum for scaling decentralized solutions for households, agriculture, and rural livelihoods, while reinforcing India's broader renewable energy and climate goals.

The State of the DRE Sector FY 2024–25 highlights this ongoing transition. The report points to a growing scale of deployments, an increasing focus on productive use of energy and livelihoods, and the continued importance of access to finance and ecosystem collaboration. I appreciate CLEAN's efforts in bringing out this annual report, which has consistently focused on critical sector themes. I hope this publication will serve as a valuable and inspirational resource for policymakers, funders, investors, and practitioners, while contributing meaningfully to India's climate action agenda.

Dr. Jeevan Kumar Jethani

Executive Director, AREAS

Scientist-F, Ministry of New and Renewable Energy, Government of India



Message from the President, CLEAN

India's decentralized renewable energy (DRE) sector is steadily moving from experimentation to early scale up. The State of the DRE Sector FY 2024–25 reflects this transition showing how DRE solutions are increasingly shifting from proof of concept toward proof of scaling, while remaining grounded in local realities and demand.

Across 26 States and Union Territories, CLEAN member enterprises are supporting households, farms, micro-enterprises, and institutions with decentralized energy solutions that extend beyond access alone. The growing emphasis on livelihoods and productive use of energy—now prioritised by over three-quarters of enterprises—signals a maturing sector that is beginning to link clean energy with income generation, MSME growth, and rural employment. While scale and outcomes vary across regions, the overall trajectory points to a sector translating ambition into action.

For policymakers, this report highlights the importance of aligning DRE with agriculture, rural livelihoods, MSME, skilling, and climate resilience programmes. For financiers and development partners, it presents an emerging opportunity to support enterprises through patient capital, blended finance, and risk-sharing instruments that match the sector's evolving maturity.

CLEAN is pleased to present this report as a practical knowledge resource offering evidence, insights, and inspiration to collectively advance inclusive growth and climate action.

Mr. Nitin Akhade

President, Clean Energy Access Network (CLEAN)

This document is the product of a **survey conducted with members of CLEAN**

62%

CLEAN Members Participated

47 of 76 clean members participated in two surveys aimed at Enterprises (Technology Suppliers and Implementers) and Intermediaries (NGOs and Ecosystem Enablers)

30

Enterprises -
Technology
Suppliers and
Implementers

17

Intermediaries -
NGOs and
Ecosystem
Enablers



26

States and UTs
across India
have 4 or more
CLEAN members
operating

Key Takeaways



Image: Aboriginal Energy

1

The **DRE** sector is **growing**

2

Productive use of energy is a key priority

3

Equitable **access to finance** is critical

4

Intermediary **collaborations** can be strengthened

The DRE sector in India is growing

DRE forms the core business for nearly 50% of the enterprises

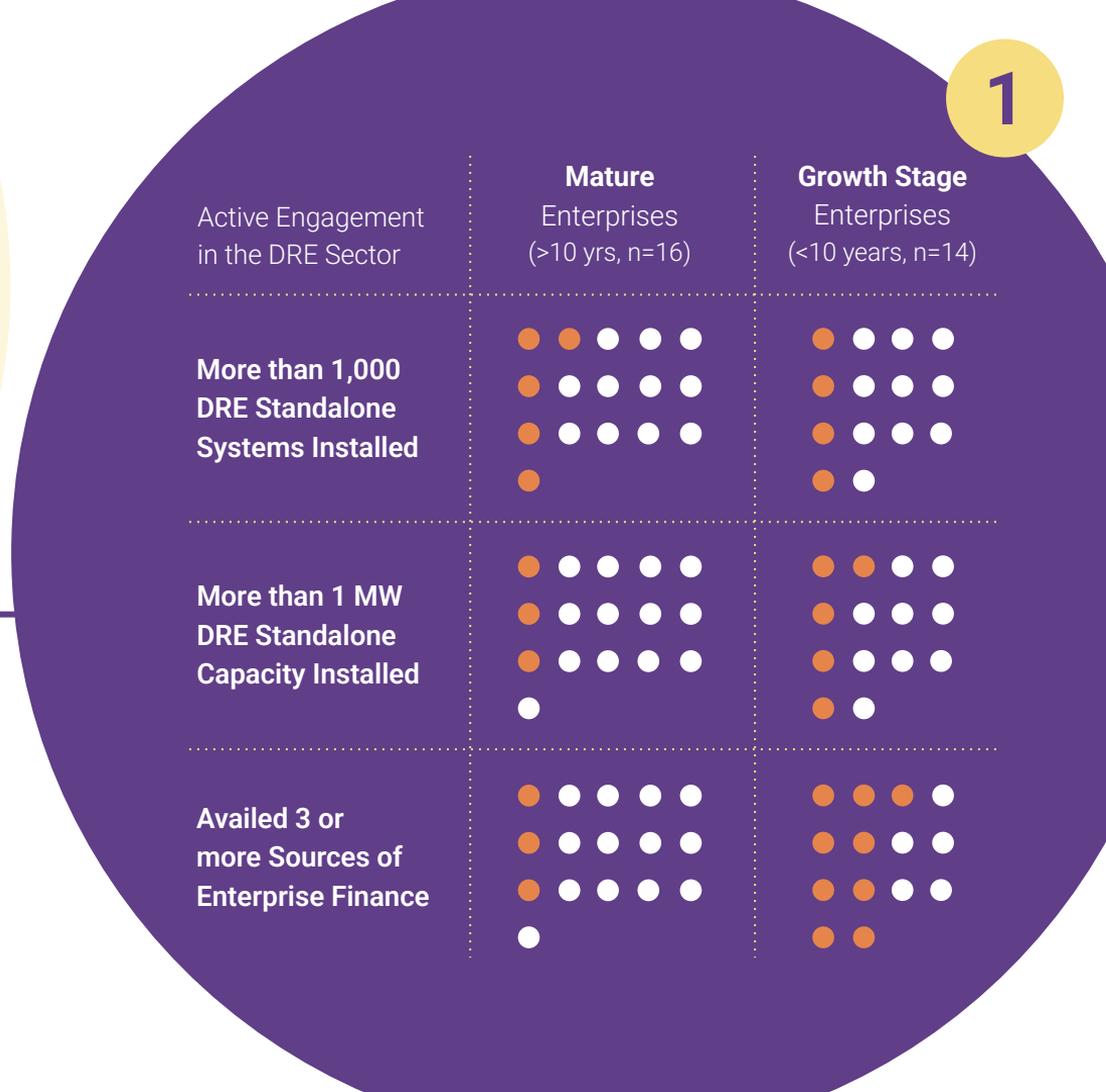
20% of the enterprises are exclusively DRE focused (100% of the portfolio) and DRE comprises 75%-100% of the portfolio for another 23% of the enterprises.

Growth stage enterprises (<10 years old) are now scaling alongside mature enterprises (>10 years old)

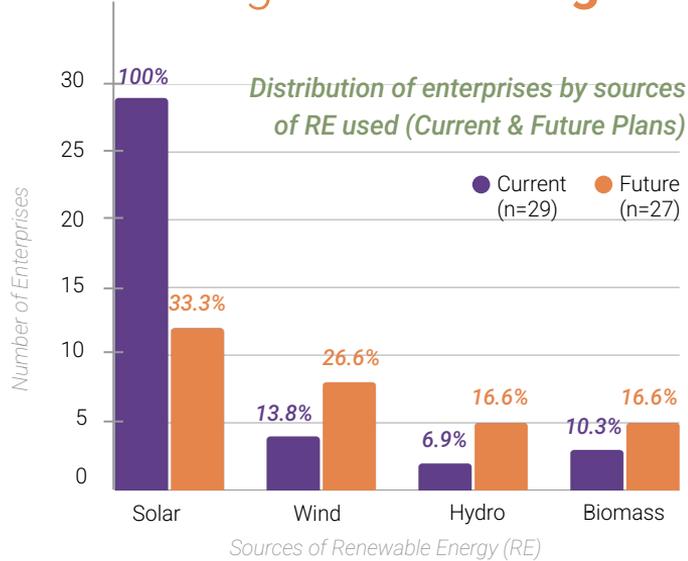
There is a increasing number of enterprises working in this sector, with growth stage enterprises catching up to mature players (some established as early as the 90's) in standalone deployments.

They are also accessing an equally diverse mix of capital like CSR/ Philanthropy grants, equity, debt etc.

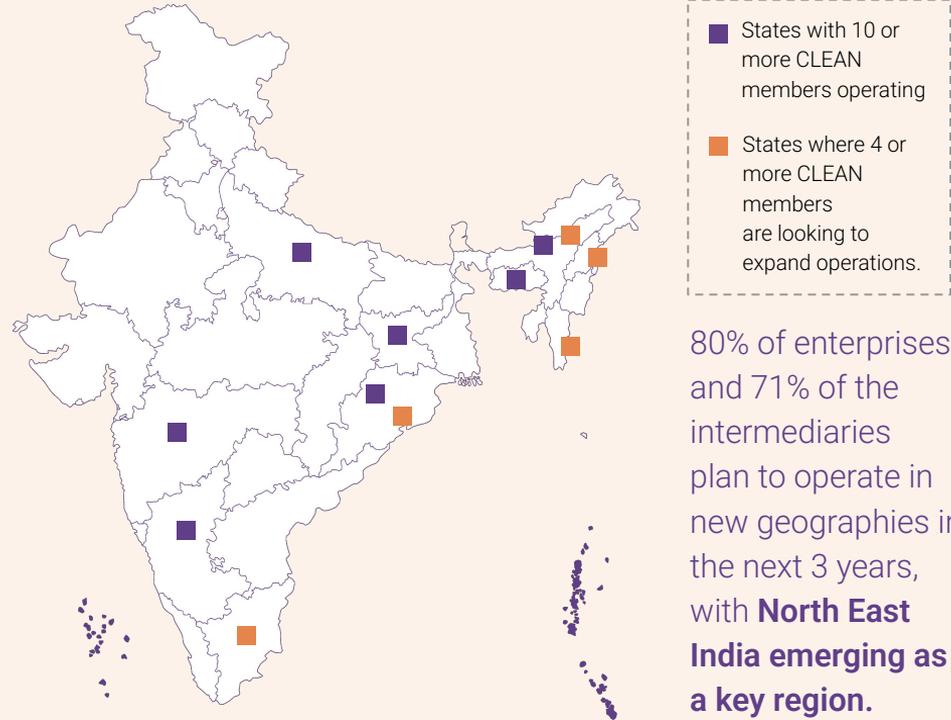
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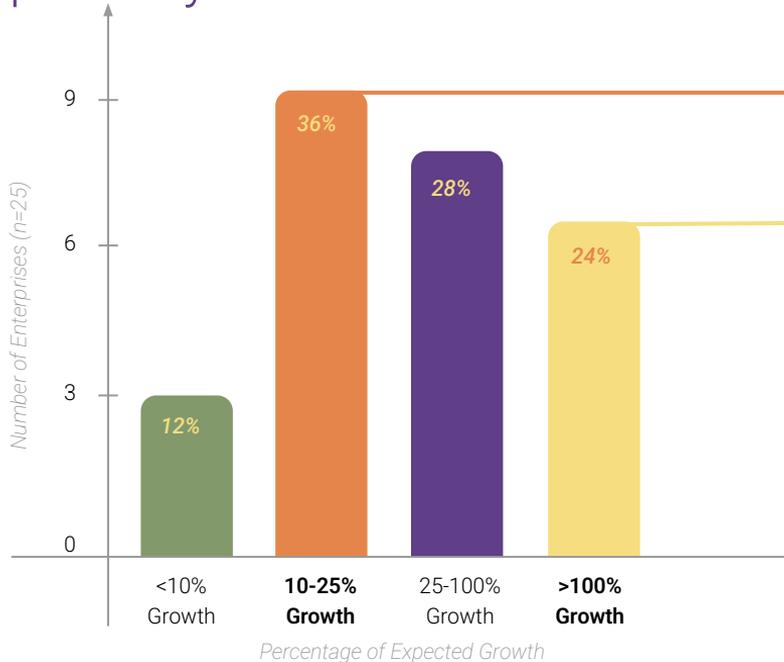
80% of enterprises and intermediaries are exploring newer markets by focusing on **technological diversification and geographic expansion**



While **solar leads today**, 90% of the enterprises are planning to **expand the use of a technology or work on a new source of DRE** over the next 3 years, mostly focusing on wind (26.6%), followed by hydro (16.6%) and biomass (16.6%).



3-Year growth expectations point to both steady expansion and rapid scale up pathways in the DRE sector



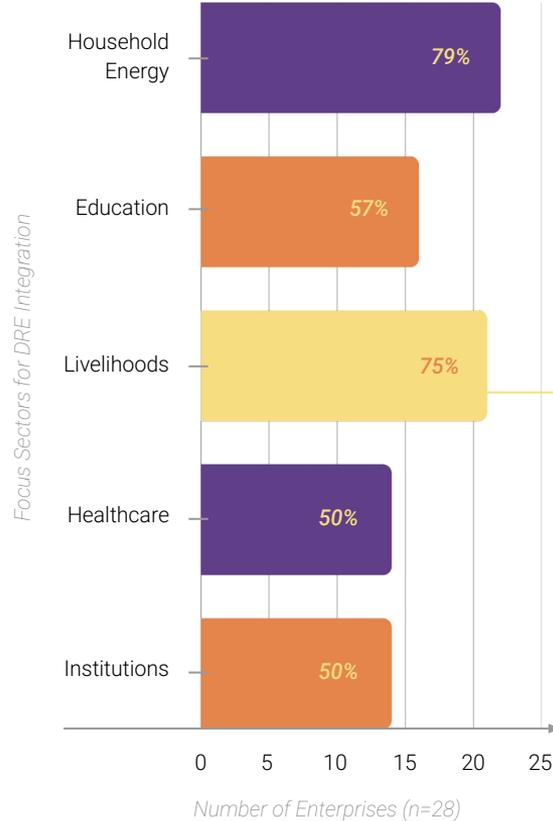
Widely deployed and sectorally diversified enterprises are positioned for steady, incremental growth

36% (9/25) of the enterprises operating in 4 or more states and sectors, anticipate a 10-25% revenue growth over the next 3 years. In FY 24-25, over half of these enterprises crossed INR 1 Cr in annual revenue, with about 1/3rd exceeding INR 5 Cr. Funding sources are personal equity (6/9), grants (8/9), external equity (3/9) and debt (4/9).

Growth stage and smaller enterprises are scaling rapidly from a lower base

24% (6/25) of the enterprises operating across 1 to 4 states and sectors, expect over 100% revenue growth in 3 years. These are relatively younger enterprises, some founded as recently as 2023 and the oldest in 2018. Majority of these have less than 1,000 cumulative standalone installations till date. In FY 24-25, half of them earned below INR 1 Cr and 1/3rd below INR 5 Cr in annual revenue. Funding sources are personal equity (6/6), grants (2/6), external equity (1/6), govt. schemes (2/6) and debt (4/6).

Over 75% of the enterprises, in addition to Household Energy, have also prioritised **Livelihoods and Productive Use of Energy** as a key application & sector



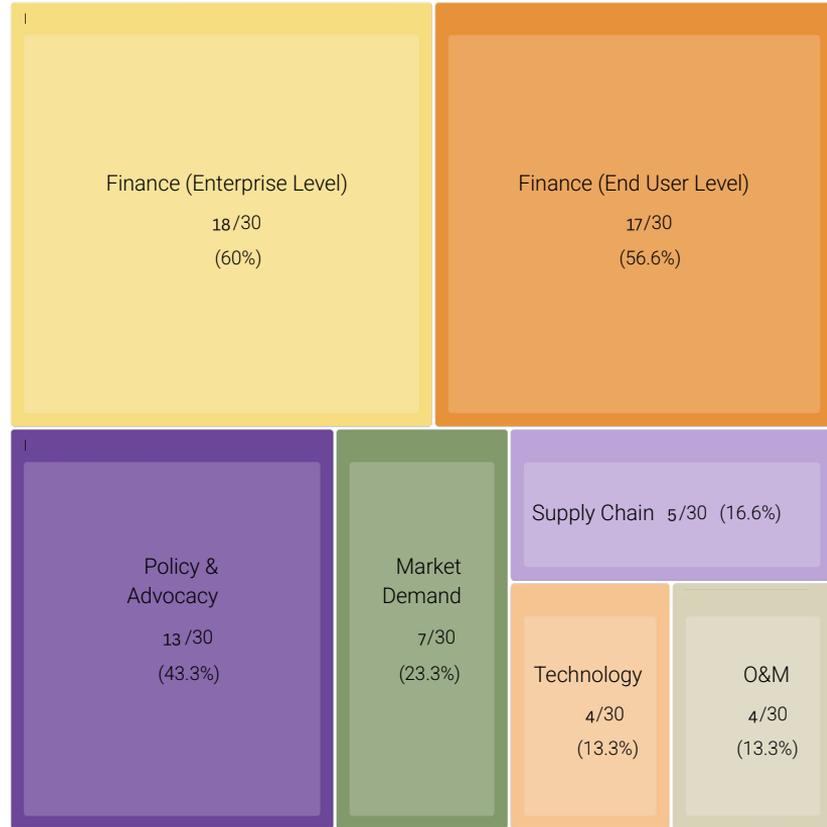
2

Among enterprises working on livelihoods (21/28), **retail & service business emerges as the leading DRE use case** followed by food processing, agri post-harvest and agri on-farm sub sectors.

- ❖ Retail & Services (11/21)
- ❖ Food Processing (9/21)
- ❖ Agri On-Farm (8/21)
- ❖ Agri Post-Harvest (7/21)
- ❖ Nano to Small Manufacturing (6/21)
- ❖ Fisheries (5/21)
- ❖ Animal Husbandry (3/21)
- ❖ Medium to Large Manufacturing (2/21)

Access to enabling policies as well as finance, at both enterprise and end user level, remains the most prevalent constraint for enterprises to grow

Growth Barriers as reported by CLEAN Member Enterprises (n=30)

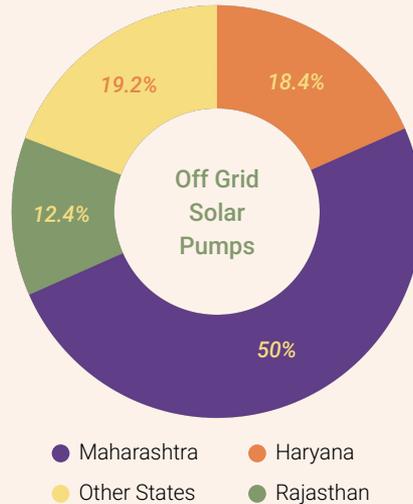


There is, however, a **growing support from Ministry of New and Renewable Energy (MNRE)**, Government of India, over the past year and significant ecosystem building efforts are underway

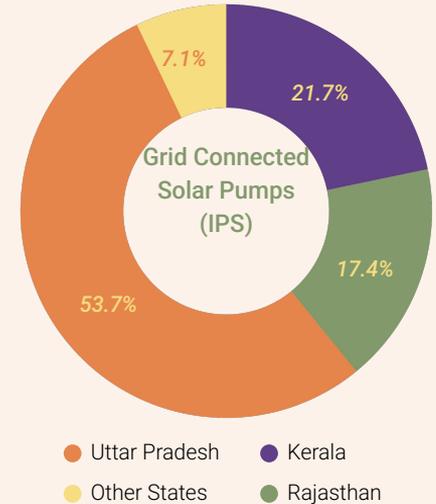
PM-KUSUM

Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan supports de-dieselisation in agriculture and farmer income enhancement, offering 30-50% central subsidies for standalone solar pumps and solarisation of existing grid connected agricultural pumps.

Over 10 lakh off-grid solar pumps and 12,000 grid connected solar pumps have been deployed under PM-KUSUM, with uptake varying across states.



10,05,898 units have been installed across 26 states in India. Maharashtra accounts for around 5 lakh units, while Haryana and Rajasthan each report 1-2 lakh units. Current progress stands at about 76% of the overall scheme target.



12,311 units have been installed across 7 states in India. Uttar Pradesh accounts for more than 6,000 units, while Kerala and Rajasthan each report 2,000 to 3,000 units. Current progress stands at about 22% of the overall scheme target.

Furthermore, over **28 lakh households** have benefited through the **adoption of rooftop solar**

Over 70% of the total no. of rooftop solar installations under PMSG: MBY come from Gujarat, Uttar Pradesh, Maharashtra, Rajasthan and Kerala put together. Lessons from these top performing states can prove critical for future expansion across India.

PMSG:MBY

PM-Surya Ghar: Muft Bijli Yojana is a government scheme that supports household rooftop solar through subsidies, enabling families to generate their own power and access up to 300 units of free electricity per month.

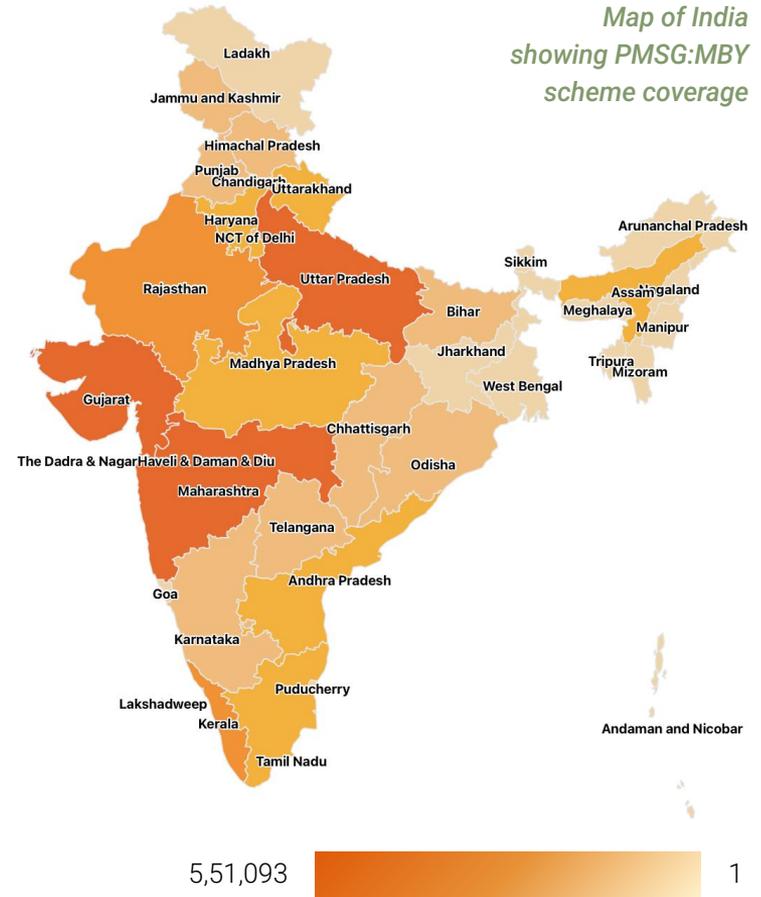
Over 23 Lakh
Units installed
across India

Over 28 Lakh
Household's
covered (group
and individual)

~8,500 MW
Cumulative solar
rooftop capacity
installed

Over
INR 16,000 Cr
Subsidy released
since 2024

Map of India
showing PMSG:MBY
scheme coverage



Enterprises headquartered in **metro and tier 1 cities** are able to tap a **more diverse mix of funding sources**, while enterprises in other regions often face practical constraints in availing these sources

Among metro/ tier 1 enterprises, only 20% rely on a single funding source, while 45% draw on 3 or more, most often combining personal equity and CSR/ Philanthropy grants.

In comparison, about 63% of non-metro/ non-tier 1 enterprises rely on a single source of funding, with a relatively lower reported uptake of government schemes.

(Base: n=28 overall, metro/tier 1 nx=20; non-metro/ non-tier 1 ny=8)

Participation in existing schemes and programs is currently seen among 6 enterprises, all of which are headquartered in metro/ tier 1 cities

National Level



Pradhan Mantri
Matsya Sampada
Yojana (PMMSY)
for fisheries
development



Startup
India
Seed Fund
Scheme (SISFS)



Credit Guarantee
Fund Trust for
Micro and
Small Enterprises
(CGTMSE)



Debt Finance by Indian
Renewable Energy
Development Agency (IREDA)

Regional Level

ELEVATE 2025

Elevate Program 2025,
Government of Karnataka

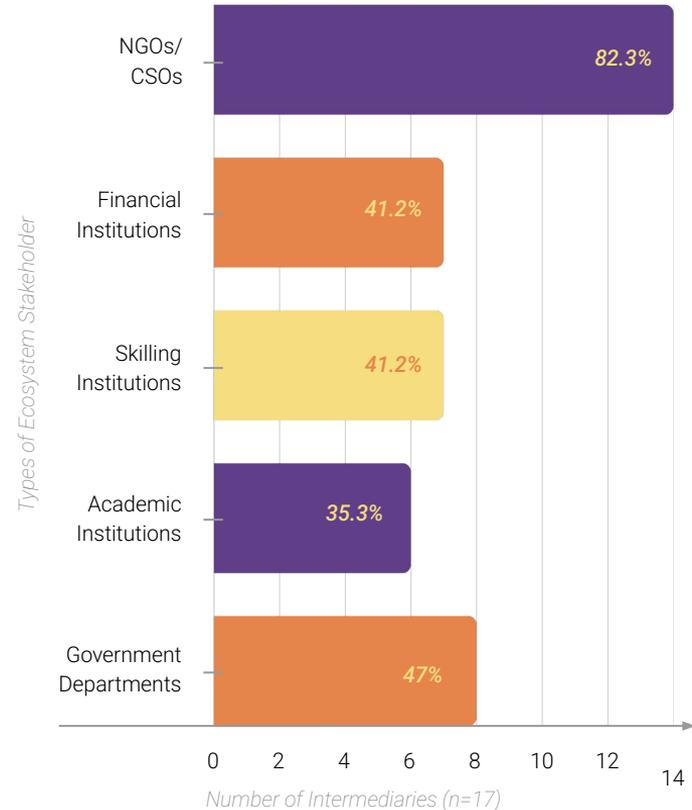


IIT Palakkad
Technology
I-Hub
Foundation
(IPTIF)

Intermediaries are **fostering strong collaborations**, however, not all are able to **build working partnerships** due to funding constraints

Most intermediaries have strong implementation linkages (82% with NGOs; 47% with government departments). Financial linkages remain comparatively limited (35%) and are spread across MFIs, NBFCs and banks. Collaboration with knowledge institutions is moderate (41% with skills/training institutions; 35% with academia).

Intermediary collaborations by stakeholder type



Survey Highlights



While the majority of enterprises surveyed are based in metros/ tier 1 cities, **a third are also based in emerging and smaller cities**

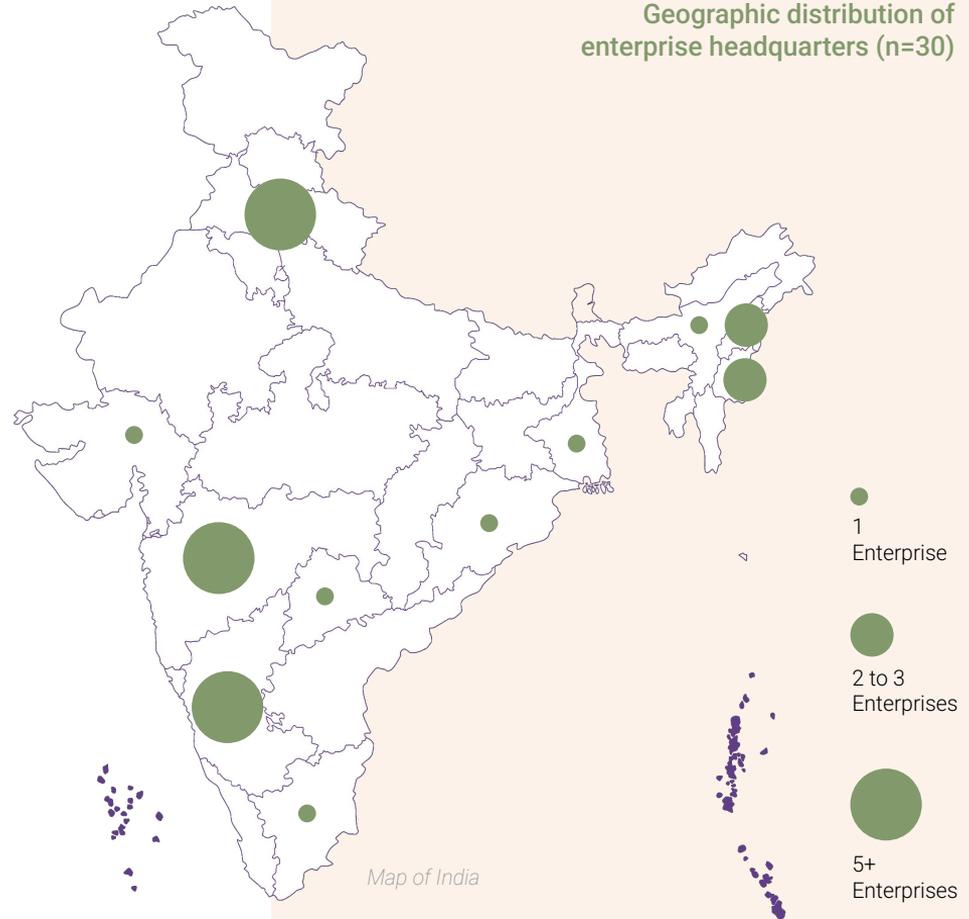
Strong DRE operations across Central, Eastern and North Eastern India

6 states host a high concentration of active DRE enterprises from the respondent base: Karnataka (47%), Maharashtra (43%), and Assam (43%), followed by Uttar Pradesh, Jharkhand and Meghalaya (33% each).

Regional gaps in DRE operations

In contrast, no enterprise in the respondent base reported operations in Mizoram and only limited presence was observed in Manipur, Kerala, Uttarakhand, Himachal Pradesh, Punjab, Haryana and West Bengal, pointing to an uneven regional penetration of DRE services.

Geographic distribution of enterprise headquarters (n=30)



Intermediaries, categorised as **state, national and global** level stakeholders, have their **roles and functions strongly shaped by geographic reach**

The trend points to a structural gradient in which local delivery is decentralised, while strategic design and scaling capacity remain largely urban centred.

Local and State Organisations

Entirely NGO led and based in non-tier 1 locations, focusing on implementation and community engagement.

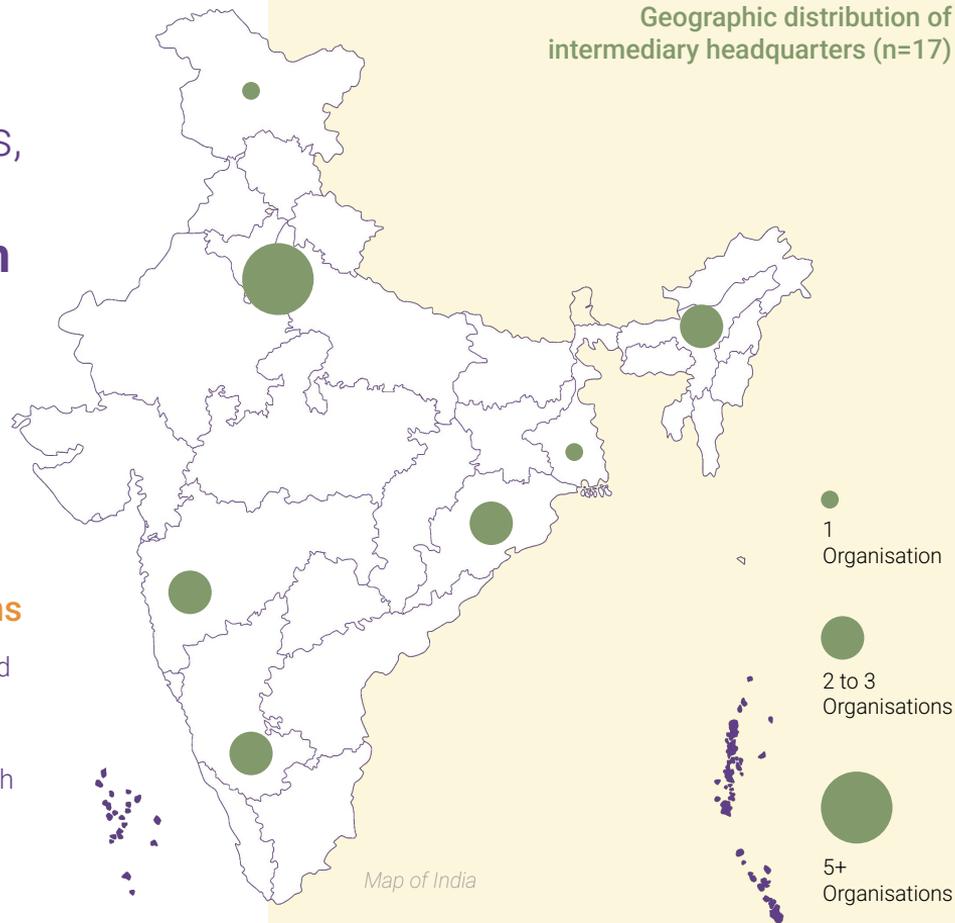
Multi State and National Organisations

Institutionally diverse with headquarters concentrated in tier 1 cities.

Global Organisations

Exclusively based out of metro and tier 1 cities, operating through international networks.

Geographic distribution of intermediary headquarters (n=17)

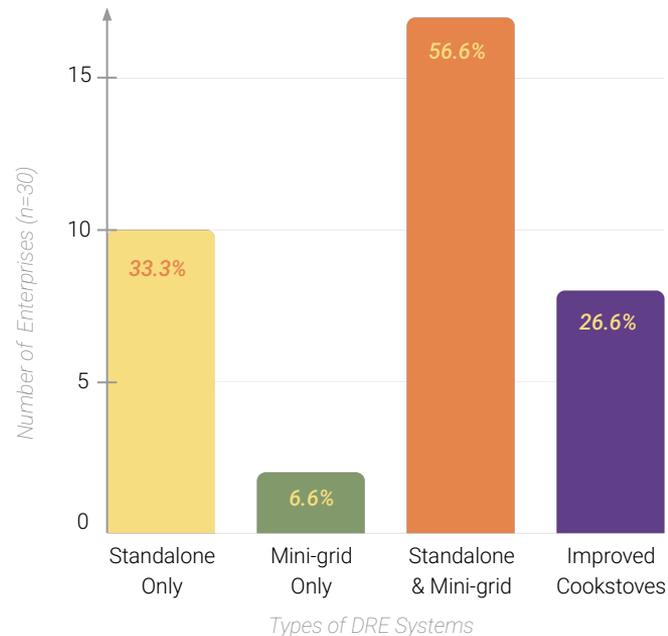


Solar energy trumps other sources of energy



Image: Aboriginal Energy

Enterprises offering both standalone and mini-grid systems dominate the ecosystem



While many enterprises have implemented over 1 MW of cumulative **standalone capacity**, the majority skew towards **sub-MW deployments**

In terms of cumulative capacity, about 70% of the enterprises remain at small to mid scale, with 35% having deployed under 100 kW and 35% between 100 kW to 1MW.

Only 30% reported 1 to 5 MW deployments, with several of them clustered below 2 MW.

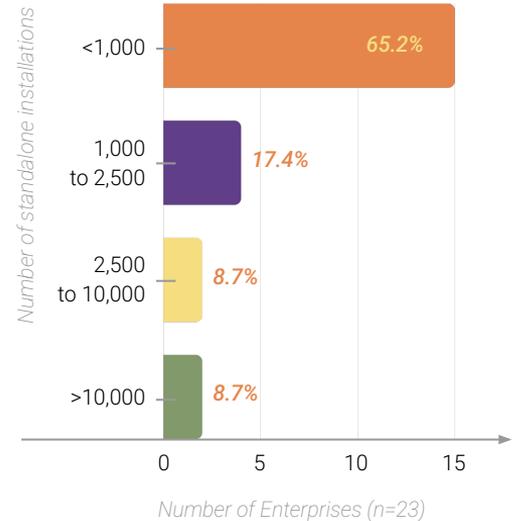
Distribution of enterprises by cumulative capacity of standalone systems deployed till date (n=23)



Most standalone systems are deployed within the **1-5 kW capacity range**

In terms of system size distribution, enterprises (n=20) indicate that 50% or more of their installations are concentrated in 3 ranges: 10% in systems below 500 W, 60% in systems b/w 1-5 kW range, 25% in systems b/w 5-10 kW range

Distribution of enterprises by cumulative number of standalone systems deployed till date (n=23)



More than half of mini-grid enterprises have **installed over 50 systems each** till date

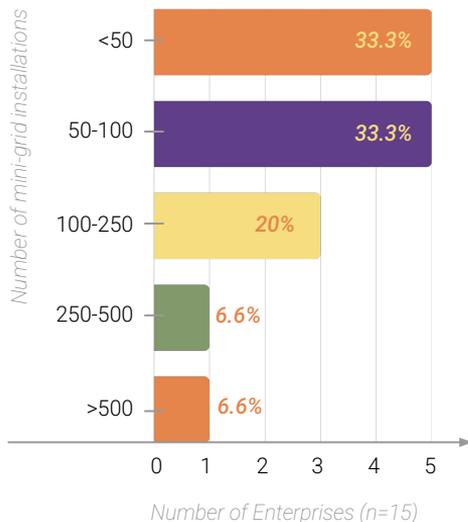
Most of the enterprises reporting number of mini-grid installations, remain at small to mid scale. About 67% have installed up to 100 systems till date (with 33% fewer than 50), while 33% have installed more than 100 systems.

Only 7% report mini-grid installations exceeding 500 systems till date.

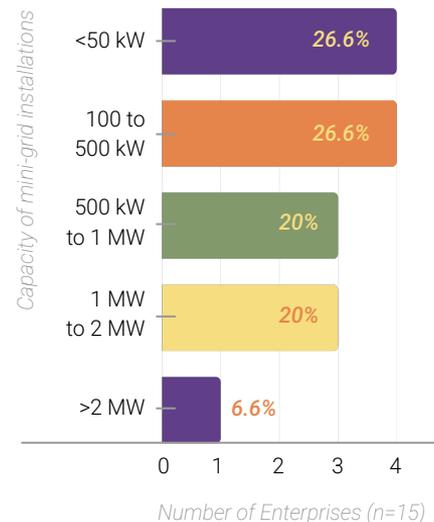
85% mini-grid systems are deployed within the **25-50 kW capacity range**

In terms of system size distribution, enterprises (n=13) indicate that 50% or more of their installations are concentrated in 3 ranges:
77% in systems b/w 25-50 kW range
15% in systems b/w 50-100 kW range
8% in systems b/w 100-200 kW range

Distribution of enterprises by cumulative number of mini-grid systems deployed till date (n=15)

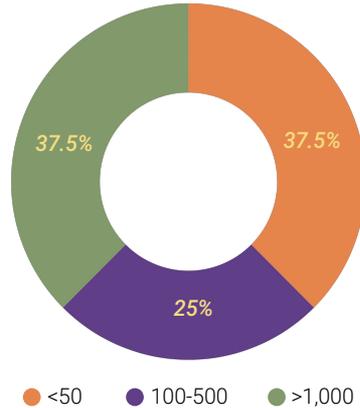


Distribution of enterprises by cumulative capacity of mini-grid systems deployed till date (n=15)

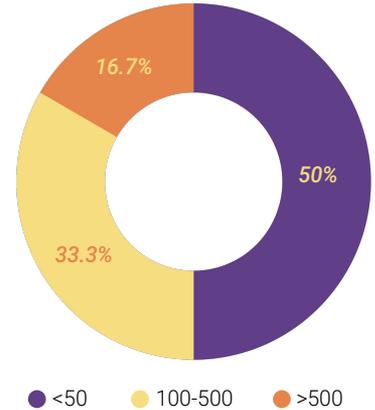


Household cookstoves have been scaled by select enterprises, while productive use cookstoves are now emerging

Distribution of enterprises by number of cookstove installations for household usage (n=8)



Distribution of enterprises by number of cookstove installations for productive usage (n=8)



Cookstove Deployments are Uneven

About 27% of the 30 enterprises have deployed improved cookstoves. Within this, about a third have crossed 1,000 installations, while most remain below 500 including some with very small deployment volumes.

Livelihood as a Core Application

While household adoption remains important, 1/4th of the 8 enterprises deploy cookstoves solely for productive use. 1 has deployed cookstoves for 500-1,000 livelihood installations and 2 for 100-250, indicating that growing traction for productive use cookstoves.

Different types of cookstoves are being provided

Including induction cooktops, solar cookers, smokeless forced draft cookers and improved biomass cookstoves

Cookstove Enterprises Are Integrators, Not Single Product or Service Providers

All 8 enterprises also work on standalone and mini-grid systems.

Enterprises - Annual Revenues

Most enterprises consistently operate in the **INR 1 to 5 Cr annual revenue range**

Enterprises most frequently reported annual DRE revenues in the INR 1 to 5 Cr range across all 3 years, representing 48% in FY 2022-23, 52% in FY 2023-24 and 44% in FY 2024-25.

In FY 2024-25, enterprises collectively generated at least INR 100 Cr in revenue, though the distribution was uneven, with 1 enterprise contributing nearly half of the total.



A diverse range of **financial sources** are being accessed by enterprises

Personal equity is the most prevalent source of capital

75% enterprises use it and 57% of them reported that it accounts for 50% or more of their total capital. Only 21% enterprises reported using external equity.

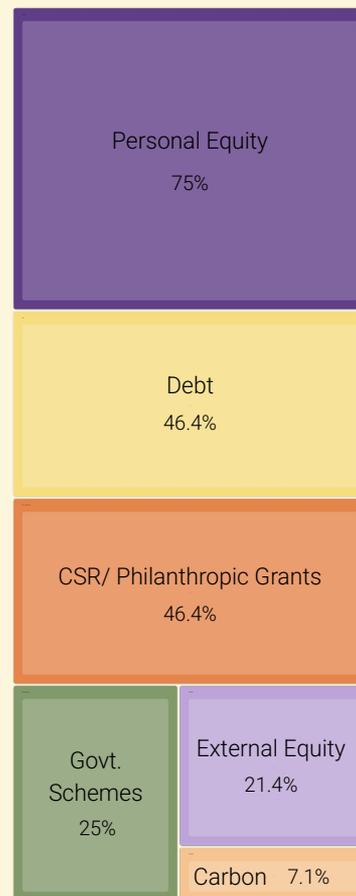
Debt, taken mostly from state commercial banks, is used by 50% of the enterprises.

Grants from philanthropic and/or CSR sources are used by 46% enterprises.

Carbon finance remains largely untapped

Carbon finance uptake remains limited. About 57% of enterprises have not yet availed it but show interest.

Only 14% are actively registered and trading carbon credits. These include technology manufacturers and developers (+ improved cookstove providers), a system integrator and a mini-grid developer.



Enterprise financing sources and share of enterprises accessing them (n=28)

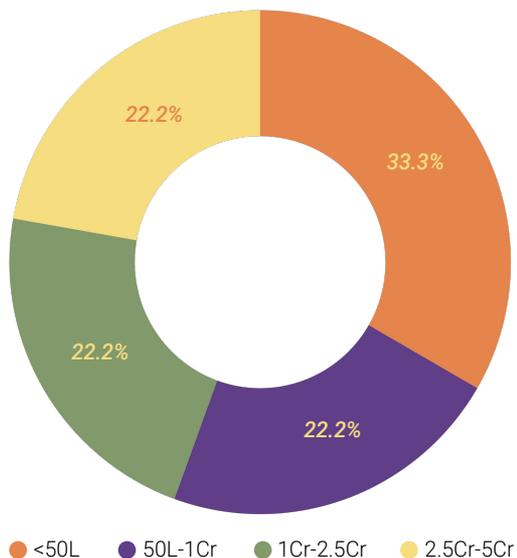


Most intermediary organisations operate with modest budgets dedicated to DRE Programs

DRE expenditure levels vary, but lower spending levels are more prevalent.

56% of the respondents reported spending below INR 60 L, with more than half of these being local and state level organisations.

In contrast, 44% reported expenditures in the INR 1-5 Cr range, with only half of them crossing INR 3 Cr, all of whom are multi state organisations.



Distribution of Intermediaries by Annual DRE Expenditure in FY 2024-25 (n=9)



Image: Himalayan Rocket Stove

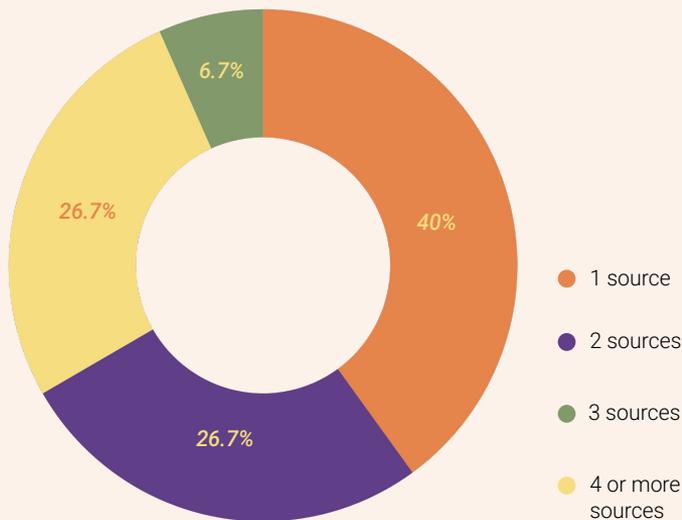
CSR and philanthropic grants play a prominent role in supporting intermediaries

60% of the organisations depend on CSR funding for their DRE initiatives and 53% rely on other domestic and international philanthropic sources.

Sources of finance for DRE programs and % of intermediaries accessing them (n=15)

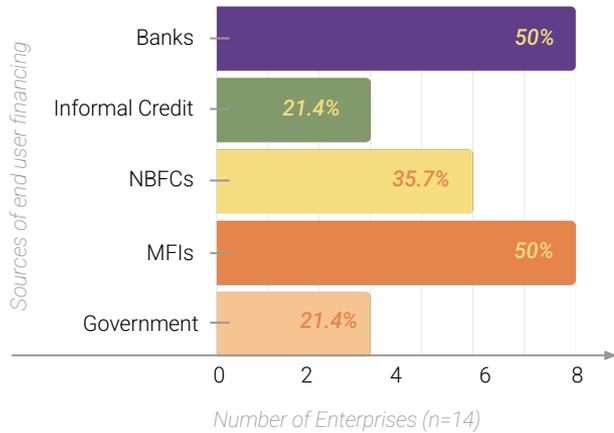


Distribution of intermediaries by number of financing sources accessed for DRE (n=15)



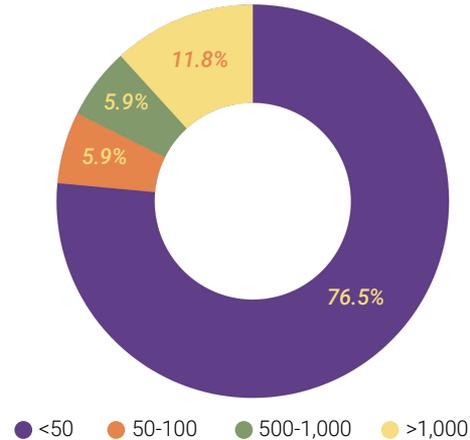
Nearly half the enterprises have enabled end user financing, however, most have achieved only pilot scales

47% of all 30 enterprises offered end user financing. Half of these partnered with banks (including RRBs) and nearly 2/3rds worked with MFIs and NBFCs.



Sources of end user financing for DRE and number of enterprises accessing them (n=14)

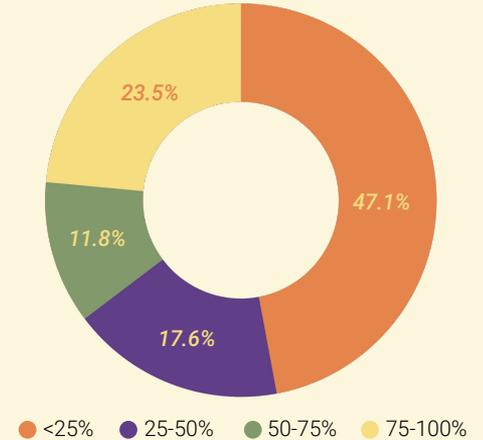
In FY 2024-25, 77% of enterprises enabled financing for fewer than 50 end users, while 21% enabled financing for over 500 end users.



Distribution of enterprises by number of end users availing finance (n=14)

End User Contribution Remains Modest

65% reported an average end user contribution upto 50%, with 47% reporting less than 25% end user contribution.



Distribution of enterprises by average end user contribution received (n=14)

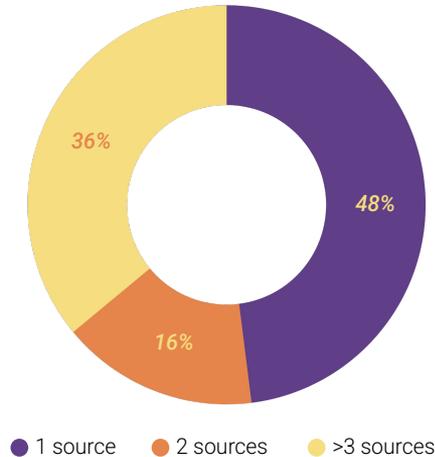
Most enterprises use **multiple models for Operations & Maintenance (O&M) services**

Majority of the enterprises are increasingly using hybrid O&M models including in-house teams, local technicians, third party service providers and in some cases, end users, in order to balance scale, cost and the need for reliable local service provision.

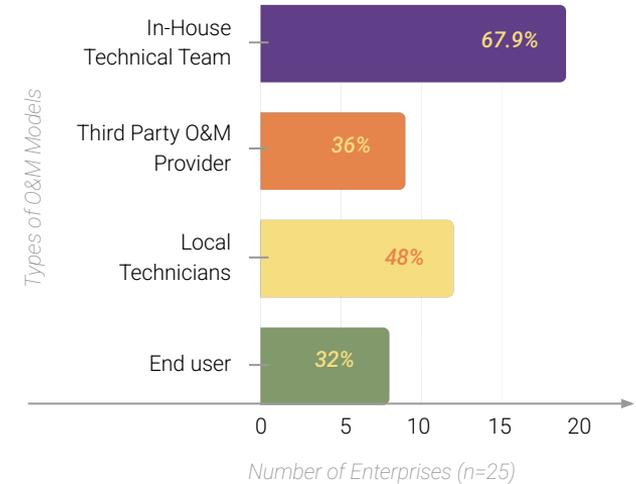
Smaller enterprises prefer to rely **purely on in-house O&M models**

Enterprises relying solely on in-house O&M are largely small to mid scale. About 36% of the respondents follow this model, of which roughly 78% have deployed <1,000 standalone systems till date. Around 2/3rd primarily rely on promoter equity and these enterprises have an average team size of about 40 employees.

Distribution of enterprises by number of O&M models adopted (n=25)

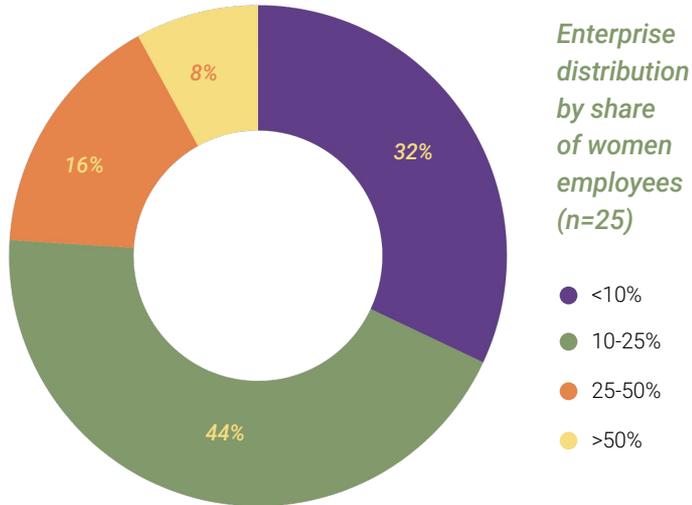


Type of O&M models and % of enterprises adopting them (n=25)



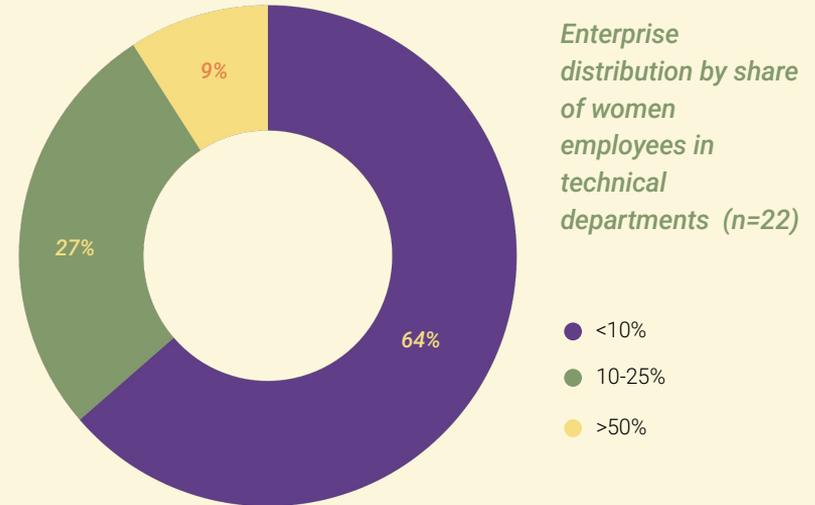
Participation of women in the DRE sector is emerging, with scope to accelerate progress.

While 83% of the 30 enterprises reported employing women, over 3/4th of these indicate that women make up less than 25% of their workforce.



While technical departments are well established, the **role of women employees in them remains nascent**

83% of the 30 enterprises have technical teams making up over half their workforce. While 73% report women in these roles, in 64% cases women comprise less than 10% of the team.



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