CHALLENGES TO THE DRE SECTOR IN INDIA IN TIMES OF **24x7** GRID POWER FOR ALL.

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What is Distributed Renewable Energy?

Distributed Renewable Energy refers to any system that uses renewable energy to generate, store (if required), and distribute energy in a localized way.

It includes off-grid - mini and micro-grids powered by solar, biomass, hydro or a combination of these sources,

It also includes improved biomass cookstoves, biogas plants, solar appliances for productive applications, health, education, in agriculture etc.

Recent definition of village electrification

A village would be declared as electrified, if :

- Basic infrastructure such as distribution transformer and distribution lines are provided in the inhabited locality and in the dalit basti hamlet where it exists.
- Electricity is provided to public places like schools, panchayat office, health centres, community centres etc.
- The number of households electrified should be at least 10% of the total number of households in the village.

Suffice to say that DRE is not the flavour of the month or even the decade

Electrification schemes of MoP: 24×7 PFA

- (24×7 PFA) is a Joint Initiative of Government of India (GoI) and State Governments to provide 24×7 power to all households, industry, commercial businesses, public needs, any other electricity consuming entity and adequate power to agriculture farm holdings by FY 19.

- FY19 more than ½ gone but power cuts even in metros are the norm

- Presently 44 million households are unelectrified - 40% in JH, 36% in Assam, 35% in UP, 31% in Odisha and 28% in Meghalaya remain unelectrified.

Saubhagya

- Pradhan Mantri Sahaj Bijli Har Ghar Yojana –“Saubhagya ensures electrification of all willing households in the country by investing in last mile connectivity

- Electricity connections would be either free or on payment of Rs 500 to be recovered by DISCOMS in 10 instalments.

- Provisions for solar power packs with battery bank for un-electrified households in remote and inaccessible areas with 5 yr (R&M).

- So Saubhagya identifies only remote and inaccessible areas or where the grid cannot reach for DRE

Ujjwal Bharat

A joint programme of the Ministry of Power, Coal and New & Renewable Energy

- Doubling Coal India's production to 100 Cr tonnes/year by 2020
- 5 times increase in renewable capacity to 1,75,000 MW by 2022
- Power generation to increase by 50% by 2020
- Energy saving to increase to 10% of current consumption

(DDUGJY) Gram Jyoti Yojana

To provide round the clock power to rural households and adequate power to agricultural consumers.

The components of the scheme

- Feeder separation (household and agricultural)
- Strengthening of sub-transmission and distribution network
- Metering at all levels (input points, feeders and distribution transformers);
- Micro grid and off grid distribution network & rural electrification

Powering agriculture

- **Component A** - 10,000 MW of Decentralized Ground-Mounted Grid-Connected Renewable Power Plants of 500 kW to 2 MW individual plant size to be commissioned by 2022.

- **Component B** - 17.50 lakh stand alone solar powered pumps with capacity up to 7.5 HP to replace diesel-powered agricultural pumps.

- **Component C** - Solarisation of 10 lakh grid-connected agricultural pumps

Ujjwal DISCOM Assurance Yojana-UDAY

UDAY - a financial turnaround and revival package for DISCOMs

It allows state governments, owning the DISCOMs, to take over 75% of their debt as of 30 Sept 19, and pay back lenders by selling bonds. DISCOMs are expected to issue bonds for the remaining 25 percent of their debt.

The DISCOMs are in a crisis but DRE continues to be ignored.

DISCOMs in crisis

Discoms are spending for the non-paying segments, with low hopes for recovery.

Outstanding debts of state-owned discoms are expected to reach INR 2.6 lakh crores, at the end of current fiscal

Drivers of growth, the industrial and commercial consumers, are going the DRE route for cost effective and quality power thus reducing cross subsidies in the consumer base.

The government, however, continues to focus only on grid expansion to improve electricity access.

DRE a low priority

- Subsidies for DRE only 1.2% of total renewable energy subsidies and 0.12% of total energy subsidies in 2017

- The current subsidy provided to coal sector (US $2.3 billion) could pay for almost 114 million solar lamps and create nine-times more jobs than solutions using conventional fuels.

- Current funding for DRE largely through KUSUM the scheme for decentralized solar pumps; allocation of INR 1.4 lakh crore for upto 28,250 MW solar power for pumping in the next 10 years.

Benefits of DRE are currently obscured

- Eliminates T & D losses
- Can be rapidly built with lower investment and customization as per community needs
- Decentralization and community involvement will act as an instrument of socio-economic development in rural areas.
- With emerging technologies, DRE is a low-hanging fruit

Globally DRE is healthy and growing

- In the last decade, DRE has experienced a three-fold increase globally (from under 2 GW to over 6.5 GW.
- Major deployment of DRE (83%) was for industrial (co-generation), commercial, and public end-uses
- DRE systems represented 6% of new electricity connections between 2012 and 2016, mainly in rural areas.
- About INR 1,846 crores (USD 284 million) was invested in the off-grid solar sector globally in 2017.
- Although increasing trends are observed globally, the numbers are still small.

Technology trends that support DRE

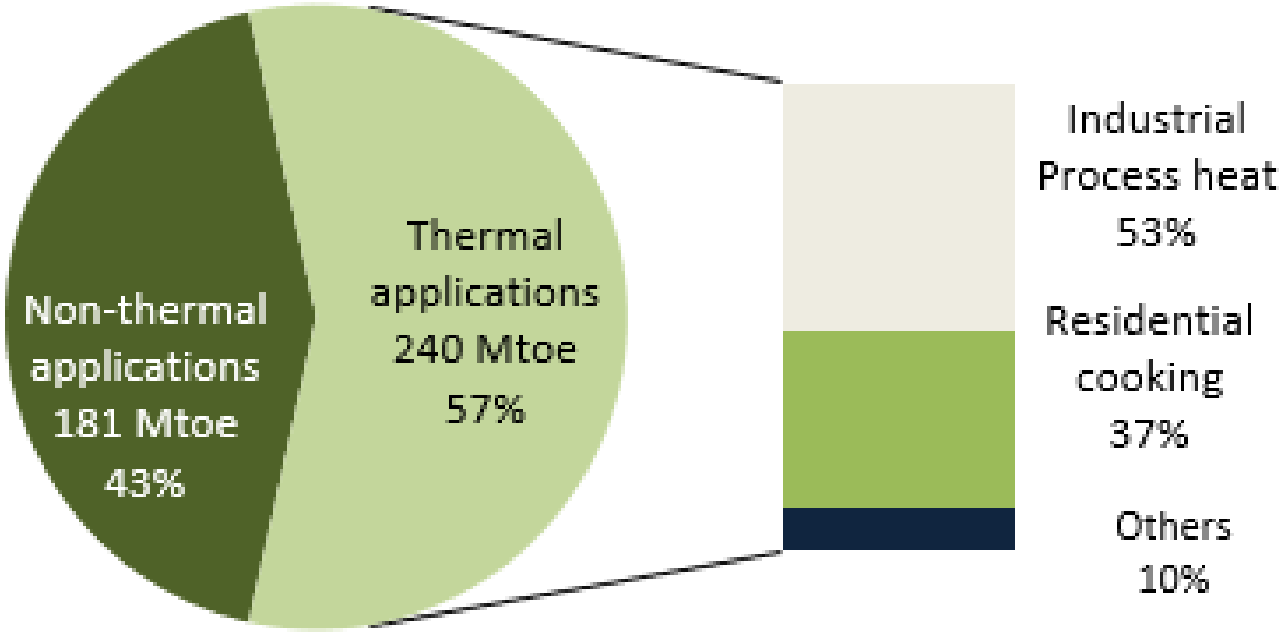
- Emergence of solar powered appliances – TVs, mixers, fans, refrigerators
- Permanent Magnetic Brushless DC Motors for fans is a key innovation
- Point of sale financing options, pay as you go models – payment in small increments using mobile apps
- Smart meters
- Falling storage costs and better longevity of Lithium batteries

- CLEAN members are now selling DC appliances with flexible payment options

DRE has productive and institutional applications

- Horticulture – 100 lakh tonnes of cold storage required
- Dairy – 1.6 lakh diary co-operatives in India
- Textiles – 10 lakh manual charkhas currently in use
- Post harvest processing – drying, milling, packing
- Health – solar PV roof top solutions for electrifying health care, solar powered boat clinics in the north east

THERMAL ENERGY IN DRE – A GREAT NEED BUT A LOW PRIORITY



Final energy consumption in 2012 (421 Mtoe)

Source: (UNDP, 2015)

Market potential for DRE*

Product	Estimated market potential in INR crores
Solar pumps	2,14,500
Solar street lights	97,500
Solar telecom towers	81,250
Solar water heaters	1,95,000
Productive applications using biomass, biogas and domestic cooking	49,613

In addition 44 million households still remain unelectrified

*source: UNDP estimates 2015

Why is DRE important for India?

- More jobs – Roof top solar highly labour intensive
- Equitable and inclusive energy access – Power for people who need it the most
- Better distribution efficiency – 20% of energy generated and distributed through grid in India is lost
- DRE improves grid resilience and reliability and so it must be a big part of the future grid
- With policy support, it can contribute to India's climate commitments

Policy framework for DRE

- Mini grids and solar pumps enjoy maximum policy support
- DRE is enjoying better policy support from state governments – Bihar & Odisha RE policy, UP mini-grid policy, MP solar pump and mini grid regulation
- High GST on DRE appliances
- No policy support for livelihoods based DRE

Financing issues

- Global momentum like SDGs was expected to be a key driver for fund flow into the DRE sector
- There is no data on whether the global momentum and recent, limited policy support from DRE has resulted in increased capital flow – probably not
- There is increased availability for concessionary debt, equity investment is very sporadic
- Grant targeted at DRE is seeing growth but more for capacity building and innovation
- Available capital appears to be larger than accessible capital with micro / mini grids claiming most of it.
- End user financing from commercial banks, RRBs and MFIs is picking up for solar pumps.

Most significant financing challenges

Sector	Challenge
Cookstoves	Frugal innovations and patchy quality
Solar pumps	High dependence on Govt. subsidy
SHS, solar lanterns, pico grids	Increasing grid infrastructure
Micro grids	Slow rate of success
Solar lantern	Sustainability of business models

Acknowledgements

State of the Decentralized Renewable Energy Sector in India CLEAN

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