Program Introduction

- The UK's Department for International Development (DFID) has been supporting the power sector in India over the last two decades

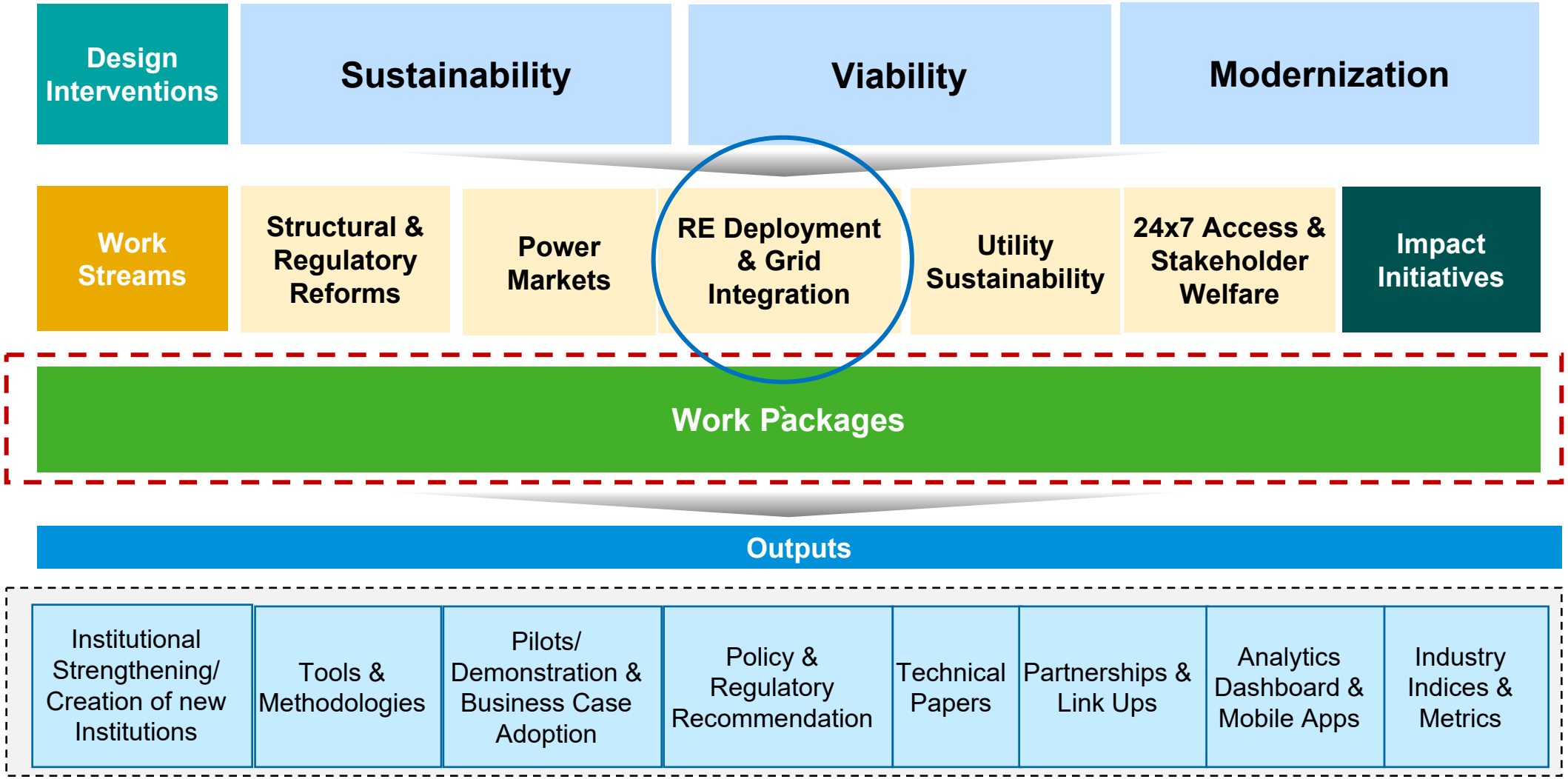
- The Govt. of India has put in ambitious plans to deliver 24x7 Power for All as well as a target of increasing renewable energy generation capacity to 175 GW by 2022. In order to meet its target, the government is taking several pro-active measures

- To support the reforms process further, UK Government and Government of India have now approved a Technical Assistance titled, "Power Sector Reform Program" to be delivered over the next four years to support at national and state level

- The objective is to achieve improved efficiency, reliability and sustainability of electricity supply, with an increased share of renewable energy in the mix.

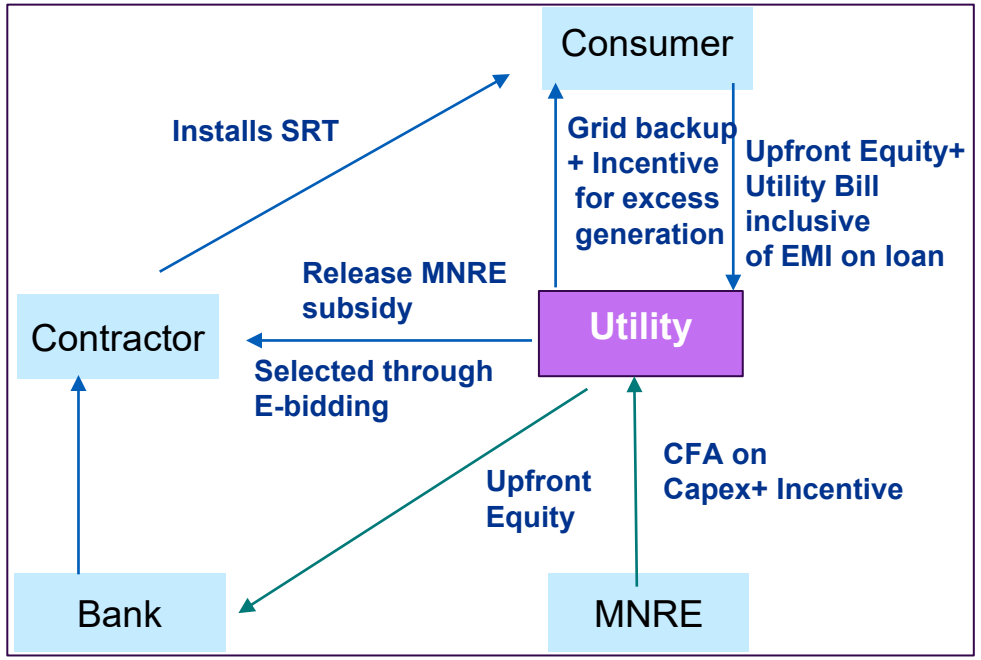
Program Architecture

The program design is logically grouped into 5 work streams



Utility driven SRT 5MW Pilot

Schematic



Key features of scheme:

- Targeted for low end domestic consumers
- Project capacity-5MW; SRT system capacity-1-1.5kWp
- Capex structure- CFA: 40%, Consumer share-60%
- Consumer to fund 10% of SRT Cost as upfront Equity
- Consumer to avail loan from Bank for 50% of SRT cost
- Utility would collect EMI on consumer loan as part of electricity bill and remit to Bank
- EPC Contractor to provide free 0&M for 5 years

Key Benefits

Utility:

- Reduced subsidy burden on Government for target consumers
- Meeting RPO for excess energy injected to Grid

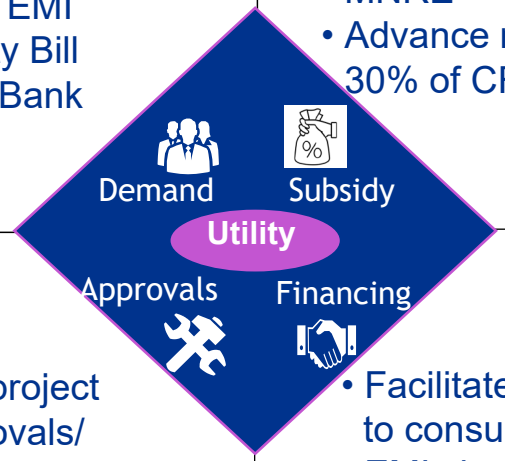
Consumer:

- Consumer self generates to meet consumption after loan period thereby savings in Utility bill
- Access to finance at reasonable terms

Role of Utility

- Demand aggregation
- Collection of EMI through Utility Bill and remit to Bank

- Availing CFA from MNRE
- Advance release upto 30% of CFA



- Facilitate in project related approvals/ clearances

- Facilitate financing to consumers
- EMI sharing on NPV neutral basis

Key achievements:

- CFA sanctioned by MNRE @30%. Proposal to be submitted on SPIN portal for 40%
- Andhra Bank has given consent to Utility to fund consumers with Loan tenure: 7.5 Yrs; Interest rate: 9.20%
- L1 price is discovered as INR 51,500/kWp through a tender published for 5MW project capacity

Journey so far

Consumer awareness workshops, marketing & Demand aggregation

Oct'18-May'19

Bid process management for 5 MW pilot project;

- Drafting bid documents
- Pre bid meeting
- Technical and financial bid evaluation
- L1 price discovery and empanelment

SRT potential estimation and consumer feedback on proposed model;

May'18

- Feasible SRT capacity is estimated (~ 12 MW)\ 2
- Locations identified are Madhavadhara and Muralinagar
- Consumer feedback on proposed models were sought

Sep'18-Feb'19

CFA from MNRE;

- Seeking confirmation on applicability of CFA
- Confirmation on advance release of CFA
- Conformation on release of CFA direct to Utility @30%

Regulatory approval from APERC;

Jan' 18-May'19

- Sought comments from Chairman and members on each model before finalisation
- Attended 2 public hearings before receiving final order

Onboarding of Banks;

- SBI, PNB, Canara, IDBI, Yes, ICICI and HDFC were reached out
- Obtained customized Loan product approved from Andhra Bank

Apr'18-Mar'19

Finalisation of model:

- Model 1: Customer owned on NPV neutral basis
- Model 2: Gross metering

Sep-Dec' 18

Stakeholder consultation on shortlisted models such as;

- Energy dept.
- APERC
- APEPDCL
- Banks and Consumers

Jun-Aug' 18

Evaluating Pros and Cons for various Utility driven SRT models;

- Utility Capex
- Developer/ 3rd Party
- Consumer owned

Jan'-May'18

Dec'17

APEPDCL seeking support from MNRE for devising Utility driven SRT scheme under PSR program

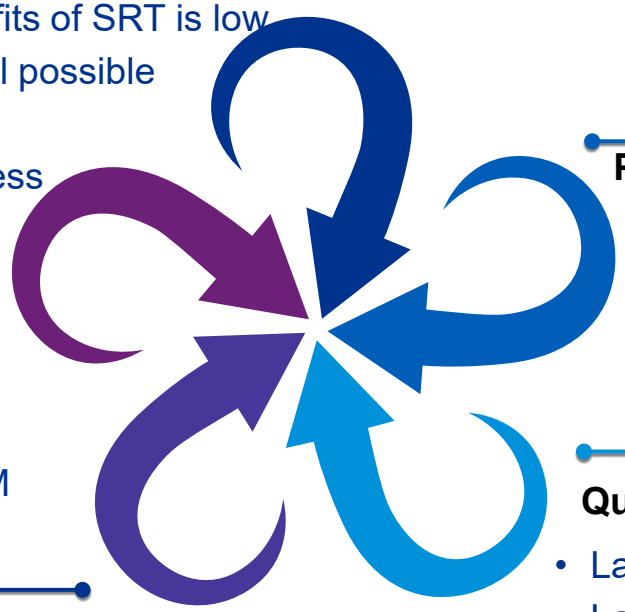
Key issues hindering scale up of SRT cap

Awareness and Capacity building

- Awareness among domestic consumers on benefits of SRT is low
- Utilities undermine the subsidy reduction potential possible through SRT adoption
- Lack of capacity of Discom in organizing awareness program, workshops etc.

O&M beyond CMC period

- Performance of modules is guaranteed for 25 years
- Suppliers provide free O&M for only 5 years
- Utility to designate dedicated team to carry out O&M beyond 5 years



Policy related

- Disbursement of CFA is accompanied with delays
- Vendors offload such cost on project
- Lack of standardization of equipment (primarily inverter) for capacity < 3 kW owing to meagre demand

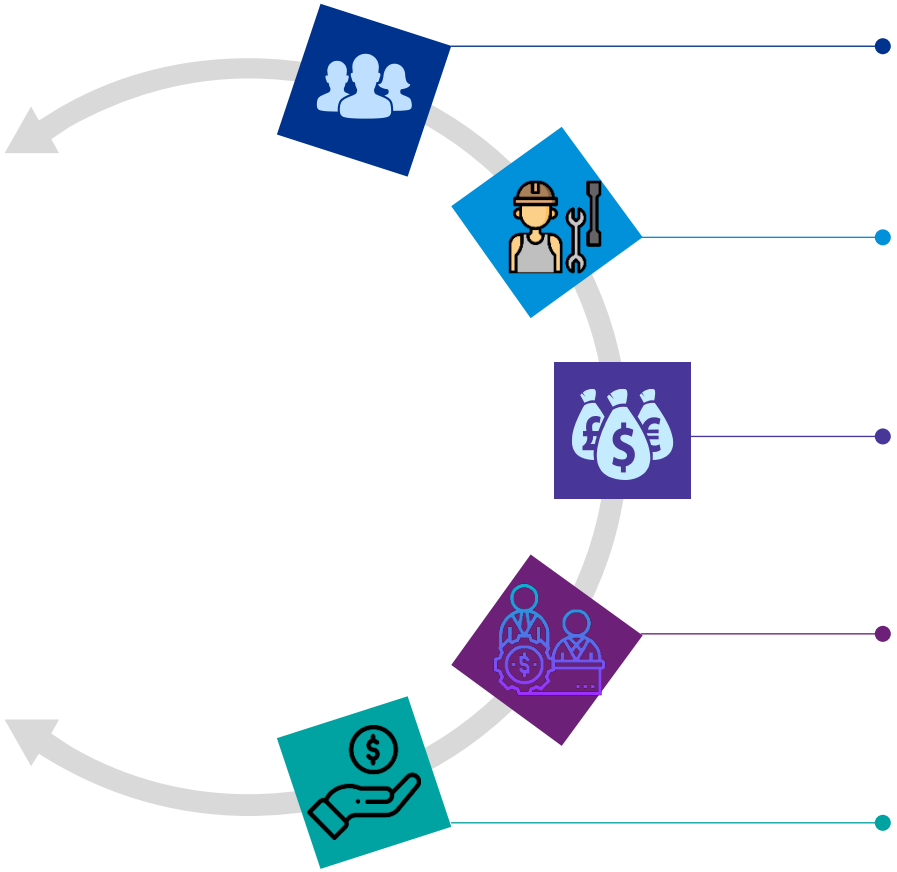
Quality of installations and new technology

- Lack of Certified installation agencies and trained technicians
- Lack of adoption of new technologies for centralized Monitoring & predictive maintenance

Financing

- Cost of debt fund available is costly (>9.5% with loan tenure <5 years)
- Banks are reluctant to fund domestic consumers anticipating default risks
- Concessional financing and multilateral funding to be tapped to ensure project viability
- Priority sector lending to be targeted for retail consumers as well

Interventions required from Utilities a



- Creation of awareness and centralized demand aggregation by Utility will help in bringing down the project cost due to economies of scale
- Creating a dedicated O&M wing for distributed solar rooftop plants
- Facilitate in arranging financing for consumers at preferential rates by onboarding Banks

  Time bound release of CFA by MNRE and revision of benchmark costs to accommodate any technological advancements
- Create demand for lower capacity SRT systems (< 3 kW) so that vendor ecosystem is developed resulting in standardization of products
- Extend financial support in the form of part EMI payment/ additional capex support up to 10-20% of project cost to make scheme more viable

Statupdate

	MNRE	Andhra Bank	5 MW pilot project	Demand Aggregation
Achievements	▪ CFA sanction in place ▪ Phased release of CFA possible ▪ APEPDCL shall facilitate the disbursal of CFA	▪ Customized Loan product in place ✓ Loan limit: INR 65,000 ✓ No loan processing fee ✓ Loan tenure: 90 months (with moratorium of 6 mons) ✓ Interest rate: MCLR + Term Premium of 0.25% to 0.50%	▪ Tender published for Pilot project of 5MW capacity ▪ Pre bid meeting was held ▪ L1 Price discovered as INR 51,500/kWp of SRT System ▪ LoIs are issued to successful bidders.	▪ Estimation of SRT potential (12 MW)
Way forward	▪ Availing 40% CFA under phase II SRT scheme ▪ Submitting proposal on SPIN portal once the modalities of Phase II SRT scheme is notified by MNRE	▪ MoU to be executed between APEPDCL and Andhra Bank		▪ Marketing the scheme (Online and Offline) ▪ Creating awareness through workshops at Zonal/sub-division level for consumer demand aggregation

Economics of the model

Baseline scenario @ 30% CFA

Total EMI on loan for first month	Discom				Customer						
	Discom's share of EMI	Levelized annual savings (during loan tenure)	Levelized annual savings (Post loan tenure)	Levelized annual savings (25 Yrs)	Customer's share of EMI equivalent to Utility Bill	Levelized annual savings (during loan tenure)	Levelized annual savings (post loan tenure)	Levelized annual savings (25 Yrs)	Upfront equity	No of years consumer to pay his EMI beyond loan tenure	Simple Payback period
477	80	860	3,850	2,170	397	-43	3,492	1,813	5,150	2.4	11.4

Scenario @ 40% CFA

Total EMI on loan for first month	Discom				Customer						
	Discom's share of EMI	Levelized annual savings (during loan tenure)	Levelized annual savings (Post loan tenure)	Levelized annual savings (25 Yrs)	Customer's share of EMI equivalent to Utility Bill	Levelized annual savings (during loan tenure)	Levelized annual savings (post loan tenure)	Levelized annual savings (25 Yrs)	Upfront equity	No of years consumer to pay his EMI beyond loan tenure	Simple Payback period
397	0	1,755	2,950	2,278	397	-9	4,291	2,353	5,150	0.0	9.3

Key inputs

Baseline parameters	Unit	Value
Cost of SRT per kWp due to scale	INR/kWp	51,500
Capacity Utilization Factor (CUF)	%	19%
Customer Equity Ratio	%	10%
Customer loan tenure	Years	7.50
Customer Debt Cost	%	9.2%

Thank You