British
High Commission
New Delhi

UK-India Technical Assistance Programme on
"Accelerating Smart Power and Renewable Energy in India" (ASPiRE)

Webinar on

INDIAN SMART METERING MARKET LANDSCAPE AND OPPORTUNITIES

22nd April 2022 | 4:00 PM (IST) / 11:30 AM (UK Time)

ASPiRE Programme Overview

2 Projects
Smart Power & Renewable Energy

7 Themes
Spread across two projects

Work Packages
Multiple activities across 7 themes

2-year project
extension possibility of 1 year

Geographic Focus
center & 8 states with strong engagement with UK supply chain

	Smart Power Project Architecture			**Renewable Energy Project Architecture**	
Project Themes	**Electricity Distribution**	**Industrial Energy Efficiency**	**E-Mobility Charging Infrastructure**	**Solar Energy**	**Off-Shore Wind Energy**	**Green Hydrogen & Energy Storage**
Work Packages with Central & select states (chosen among Andhra Pradesh, Himachal Pradesh, Telangana, Karnataka, Gujarat, Tamil Nadu, Delhi & Maharashtra)					
Cross Cutting Activities	**Green Financing**				
	UK India Knowledge Forum / Investment Promotion				
	Gender and Social Inclusion				
Intermediate Outcomes	**Policy Products and Tools**	**Robust project pipeline**	**Commercial & Knowledge Partnership**	**Innovation**	
Outcome	**Improved investment environment through policy adoption, investment mobilisation & enhanced knowledge and skills**		**New partnerships between India and international institutions**		
Impact	✓ Increased investment to support energy security & economic growth that is inclusive, low carbon, supports poverty reduction & climate action ✓ Increased trade, investment & relationships between India and UK				

Contents of this webinar

1. Indian Power Distribution Sector
2. Smart Metering Market and Key Reform Initiatives
3. Enabling Frameworks for Smart Meter Implementation in India
4. UK – India Collaboration Opportunities

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Indian Power Distribution Sector

Critical Needs of the Indian Power Sector

	Viability *Restoring sector viability & improving efficiency*	Sustainability *Robust planning and optimal resource mix*	Modernisation *Future ready & customer centric power sector*
Aspects	✓ Universal electricity access ✓ Efficiency Improvement and cost reduction ✓ Tariff, Incentives & Subsidy Delivery Mechanisms ✓ Energy (procurement and sales) management ✓ Consumer retention and demand growth	✓ Achievement of RE/RP targets & manager RE integration ✓ COP 26 commitments – net-zero carbon emissions, reduction in carbon intensity, etc. ✓ Ensuring resource adequacy ✓ Supportive market structures & financial innovation	✓ 24x7 power for all implementation ✓ Improved reliability and quality of supply ✓ Consumer centricity & inclusion through smart solutions ✓ Network Augmentation ✓ Uptake of 'NextGen' Technology.
Potential actions	✓ Enhanced performance monitoring to reduce AT&C Losses ✓ Robust financial management to reduce ACs-ARR gap ✓ Modern IT based governance ✓ Increased private participation ✓ Retail competition – choice to consumers ✓ Reduction of cross subsidies & promoting DBT for subsidies ✓ Stronger contract enforcement	✓ Promoting battery storage/ pumped storage to support RE ✓ Scaling up EV charging infrastructure ✓ Revamped Renewable Energy Certificate Mechanism ✓ Green Day Ahead Market ✓ Testing and deploying viable and innovative Grid/ off-grid models ✓ Capacity addition planning modelling ✓ Institutionalization of planning skills	✓ Single window policy for 24x7 power ✓ Tracking of consumer services and reliability goals ✓ Digitalization ✓ Smart metering on mission mode ✓ Mapping network investments ✓ Offering consumer choice ✓ Linkage to new initiatives- smart mobility, industrial policy, solar pumps.

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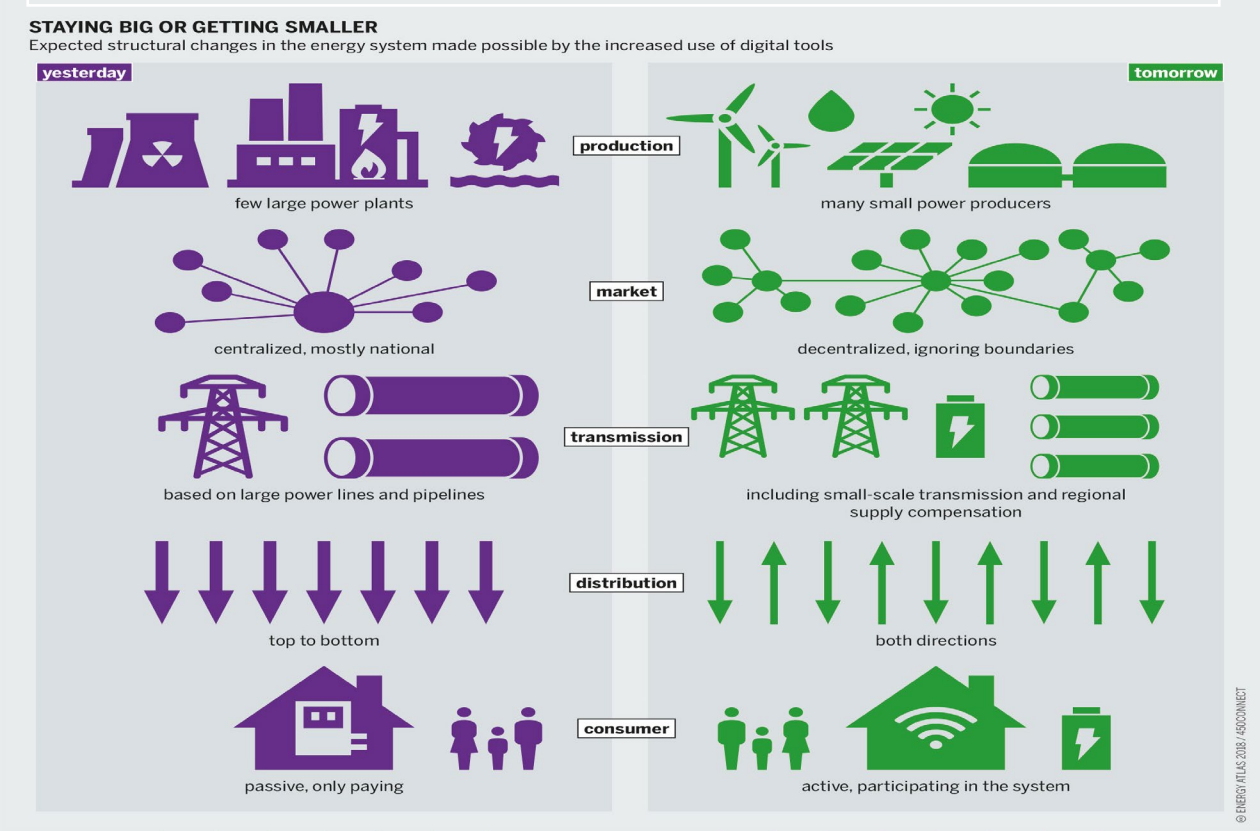
New Energy Systems Are Progressively Becoming More Distributed

‘New Grid’ Elements



Source: Energy Atlas 2018 – Green European Foundation

Requirements to facilitate the transition

- **Reform and Transform**
- **Decarbonize**
- **Technology-Digital-Analytics**
- **Investment**
- **Resilience**
- **New Market Structures**
- **Customer Centricity**

Various policy initiatives have already been taken up to enable this transition such as Revamped Distribution Sector Scheme, new power market products, revised national electricity policy, electricity (rights of consumers) rules, etc.

Smart Metering Market and Key Reform Initiatives

Smart Metering Journey So far

Initiation Stage (2011 – 2015)

- Smart Grid (SG) defined in Electricity (Amendment) Bill 2014
- 14 SG Pilot Projects Launched

2011

- Indian Smart Grid Task Force and Indian Smart Grid Forum established by GoI

2014

- National Smart Grid Mission (NSGM) established
- Model Smart Grid Regulations issued by FoR
- BIS standards released for smart meters

2015

Foundation Stage (2016 – 2020)

2016

- Functional Requirements for Smart Metering by CEA

2017

- Commencement of large-scale deployments by Energy Efficiency Services Limited (EESL)

2018

- Model DPR & RfP documents issued by NSGM
- 4 more SG projects sanctioned

2019

- Amended metering regulations published by CEA
- GOI issued advisory to replace all meters with smart meters by 2022

2020

- Electricity (Rights of Consumers) Rules, 2020 - all connections to be given with prepaid smart meter

Scale-up Stage (2021 – 2025)

2021

- Empanelment process for AMISPs and smart metering OEMs notified, and Request for Empanelment issued

2022

- New Revamped Distribution Sector Scheme with emphasis on smart metering announced by Finance Minister in Union Budget
- Model document for selection of AMISP on PPP basis was notified by MOP in 2021

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Current Status of Smart Metering in India

Sanctioned Smart Meters

Total ~*11.25 mn* meters

Installed Smart Meters

Total ~*4.00 mn* meters

Smart Metering projects have been implemented under various schemes

1. ***Smart Grid Pilot Projects by NSGM***
2. ***Grants sanctioned by NSGM***
3. ***Integrated Power Development Scheme (IPDS)***
4. ***Smart Metering National Programme (SMNP) by EESL***

Accelerated deployment of smart meters is expected under the RDSS

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Source: NSGM Dashboard

Reform Initiatives under RDSS focuses On Utility Modernization

Smart metering is the stepping-stone towards utility modernization & Indian Utility's transition journey

RDSS Objectives

1	**Improve power quality, reliability and affordability**
2	**Reduce AT&C losses to 12-15% by 2024-25**
3	**Reduce the ACC-ARR gap to zero by 2024-25**

Component A - Metering	Component B – Distribution Infrastructure Work
• 100% consumer smart prepaid metering • 100% system metering for feeder & DT	• **Loss Reduction** – armored cables, new feeders, feeder segregation, HVDS in high loss areas, conductor replacement • **Network Strengthening** – substation augmentation, IT/OT enablement, SCADA, ERP, CIS-Billing, DMS, etc

Key Focus Areas under RDSS

1 Smart Metering

- Emphasis on rollout of smart meters to improve power quality, reliability and affordability

2 Smart Grid Knowledge Centre

- Resource center for advanced technologies, Innovation Park and Technology Incubation Hub

3 Power Sector focused Incubators

- Incubation programme for start-ups/ technology players for implementation of pilot projects

4 Strengthening Start-up Ecosystem

- Dedicated start-up missions at the state level focused on new age technologies

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Revamped Distribution Sector Scheme

Goals and Targets

- **Target** – Deployment of **250 million smart meters**
- Implementation in **2** (**two)** phases
- **Phase 1** – **~100 million** smart meters by **December 2023** in UTs, Industrial, Commercial, Government offices and other areas with losses>15%
- **Phase 2** – **250 million** smart meters by **December 2025** in remaining areas

Outlay and Features

- Scheme outlay of **~GBP 30.58 Bn.**
- Government Budgetary Support of **~GBP 9.83 Bn.**
- **Results Linked** - grants tied to **performance** of DISCOMs on Operational & Financial performance and Reform initiatives
- **Model SBD** for AMISP on DBFOOT basis notified by GoI
- **Empanelment process** for AMISP as well as component/solution vendors released b

Policy & Regulations

- CEA Metering Regulations issued in 2021
- All **new meters** to be **prepaid** Smart Meters
- Smart meter for **all feeders** by December 2022
- Phase-wise **transition** of **existing meters**

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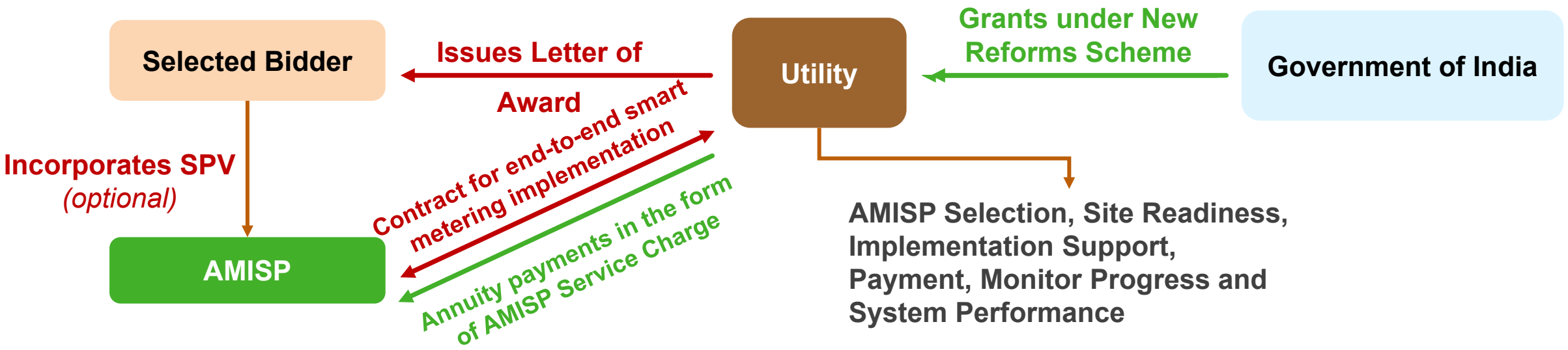
Enabling Frameworks for Smart Meter Implementation in India

Smart Metering Project Structure under RDSS



Key features of SBD

- ✓ Tender Evaluation: Single Stage Two-Envelope Bidding process with e-Procurement– Technically Qualified Bidder with the lowest Financial Bid
- ✓ Business Model: Design Build Finance Own Operate Transfer (DBFOOT)
- ✓ Payment Type: (i) Per meter per month; (ii) Lumpsum payment per meter; (iii) Payment for execution of new requirements for software change
- ✓ Contract Period: 10 years: 2.5 years for installation + 7.5 years for O&M

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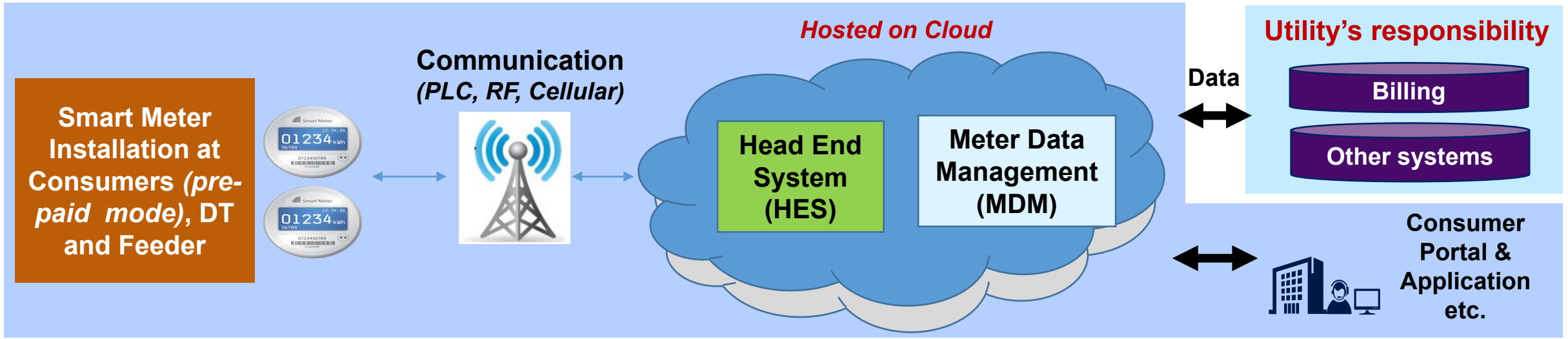
Smart Metering Scope of Work



a) End-to-end smart metering for consumers at contiguous electrical locations

b) Consumer indexing for contiguous electrical locations

c) Consumer engagement plan

a) Communication Infrastructure (with Plug and play communication module for any given technology)

a) HES and MDM Deployment on cloud

b) AMI System Integration

c) Network Operation cum Monitoring Centre

d) Other necessary software

a) Automated energy audit report generation

b) Generation of SLA performance report

c) Prepaid functionality

d) Infrastructure for recharge / bill payment through phones / offline channels

a) Consumer portal & Mobile App

b) Testing, inspection, Quality Assurance/ Quality Control

c) Operation, maintenance, and support services

d) Training of Utility personnel

e) Project Management

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Key Benefits of SBD for all stakeholders

Utility

a) Capex: No upfront capex

b) Payment Mode: Fixed AMISP service charge on monthly basis (INR per meter per month)

c) Penalty: Linked to defined SLAs

d) Technical Specifications & Functional Requirements: Standardization to ensure interoperability

e) Ownership Transfer: At zero cost

AMISP

a) Payment Structure: Commence on operationalization of 5% smart meters or 25000 meters (whichever is less). Monthly payments based on number of meters operationalized

b) Payment Mechanism: Direct debit facility for the entire online consumer payments for recovery

c) Testing & Inspection: Under purview of AMISP

d) Subcontracting: Flexibility to select/ change subcontractor

e) Concept of Meter-Months: For ease in tracking AMI operations & contract period

Consumer

a) Consumer Engagement: Awareness + participation

b) Dis-connection Protocol: Protects consumer interest

c) Pre-Payment Infrastructure: Recharge convenience through feature phones / different channels

d) Portal/Mobile App: Access to self-service capabilities

e) Data Privacy & Cyber Security: Robust guidelines

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Empanelment Process To Ensure Smooth Rollout of Smart Meters

- REC introduced empanelment process for AMI Service Providers in March 2022
- Demonstration of AMI prepaid systems through Pre-Qualification demonstration test prior to participation in smart metering projects
- AMI Service Providers (AMISPs) to demonstrate their proposed solution in a controlled test environment before implementing their solution on actual site.
- Request for Empanelment (RfE) issued for empanelment of firms.
- Only empaneled service/ solution providers will be eligible for participating in smart meter tendering process at the state level

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Step-by-step Approach For Empanelment Process

Step 1 – Formulation of Partnership for Empanelment Application

- Applicants to form partnership with components/ solution providers:
  - Smart Meter Manufacturers (2 nos.)
  - Head End System
  - Meter Data Management System
  - System Integrator
  - RF Communication Provider (if applicable)

Step 2 – Submission of Empanelment Application

- Applicant to respond to RfE for participation in empanelment process
- Submit documentation meeting the Eligibility and Qualification requirements
- Each component/ solution provider to be successfully empaneled with at least one Applicant

Step 3 – Demonstration of End-to-end AMI Prepaid Solution

- Demonstration of end-to-end AMI prepaid solution in front of testing agency
- Demonstration of at least 100 meters through
  - **Option 1** – live demonstration in Utility project area
  - **Option 2** – Controlled Test Environment in designated laboratories
- Empanelment certificate awarded for successful demonstration

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UK - India Collaboration Opportunities

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1 **Immediate opportunity for empanelment – direct or through partnerships**

- ❑ First phase of empanelment under RFE *(ongoing)*
- ❑ Empanelment to operate on rolling basis as a continuous process
- ❑ Link for further information: https://recindia.nic.in/uploads/files/AMISP-RFE12032022.pdf

2 **Large scale deployment plan for 250 mn meters under the RDSS Scheme**

- ❑ Standard Bidding Document for AMISP notified by GoI. Version 3 awaited with updates
- ❑ States to issue separate tenders for deployment. Typical size of 1-2 mn smart meters (multiple tenders underway)
- ❑ Link for further information: https://recindia.nic.in/uploads/files/AMISP-SBD22102021version-2.pdf

Collaboration opportunity with UK in the following areas

- ❑ AMI Service Provider
- ❑ Smart Meters
- ❑ Communication Systems
- ❑ Head End System Providers
- ❑ MDMS Providers
- ❑ Advanced Analytics
- ❑ Financing

Possible areas of support to facilitate UK – India connect	Dissemination of capability statements	Periodic updates on the opportunities and evolving landscape
	Pilot and technology demonstrations	Specific support required by interested firms (TBD)

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Thank You!