

Energy Efficiency - Demand Response Driven Energy Efficiency (DREAMS)

Procurement Tender

Reference No: 2024/02/SIN/DREAMS/01

Hardware and software support for piloting demand response for DREAMS project

1. DREAMS project

1.1 Background

The DREAMS project is funded by the Norwegian Ministry of Foreign Affairs (Royal Norwegian Embassy, New Delhi). DREAMS is a 3-year project from 2022 to 2025 to implement Automated Demand Response (ADR) pilots in India. The project consortium comprises of 6 partners including Smart Innovation Norway (SIN), Research and Innovation Circle of Hyderabad (RICH), Indian Institute of Management, Ahmedabad (IIM-A) and 3 Distribution Companies - DISCOMs (BRPL & BYPL in Delhi and NPCL in Noida) in India. The DREAMS project aims to demonstrate and promote ADR and real-time consumer insights to increase the renewable hosting capacity of the grid, offer support to grid operators through flexibility services and support India's multiple initiatives on climate change, net-zero commitments and renewable energy targets.

1.2 the buyer

[Smart Innovation Norway \(SIN\)](#) works towards a green transition and new jobs through research, innovation, and scaling. The company is a non-profit research and innovation organisation that assists businesses and the public sector with networks, capital, and expertise in energy transition, applied artificial intelligence, and climate initiatives.

Smart Innovation Norway (SIN) is the 'Project Coordinator' for the DREAMS project.

1.3 the project partner

[Research and Innovation Circle of Hyderabad \(RICH\)](#) is a Telangana state innovation ecosystem enabler and a Science & Technology (S&T) cluster under the Office of Principal Scientific Adviser (PSA), Government of India (GoI). RICH is a state-sponsored not-for-profit institution that works along with the key ecosystem players i.e. Academia, Startups and Industry, to foster research and innovation networks and drive up the innovation index in the region. It works on innovations in the areas of energy transition, energy management, green hydrogen, e-waste management and Sustainability.

Research and Innovation Circle of Hyderabad (RICH) is the 'Pilot Manager' for the DREAMS project.

2. Procurement scope

For the DREAMS project, we need to conduct Automated Demand Response (ADR) pilots for 4 months distributed as follows - 2 months in summer – (around May-June 2024) and 2 months in winter (around Dec 2024 to Jan 2025) with a total of at least 300 Residential, Commercial and Industrial consumers belonging to three DISCOMs (Distribution Companies) in Delhi & Noida. This will give us an opportunity to study consumer behaviours based on incentives offered, time of day, types of organizations, energy assets available etc.

ADR enables the grid operator or the DISCOMs to incentivize its consumers to demonstrate grid-friendly energy etiquette, in other words delivering flexibility to the grid during a peak event when the grid is under stress. This helps the DISCOMs because it enables them to invest less in grid capacity enhancements, and at the same time, it can also save on energy procurement costs during peak hours.

The current tender is being called for the selection of Solution Providers who can offer the technology platform (software and hardware) and provide necessary operational support for the duration of the field pilot in the DREAMS project.

2.1 Hardware requirements

The hardware used in the field pilot should be compact, consumer-friendly, reliable and economical. It should comply with regional regulations and should be easy to integrate with the software platform. The hardware provider should provide a mobile app for the user to independently monitor and control the smart plugs and other hardware supplied. The hardware supplier should also be willing to work with the software company and offer support for integration into the software ADR platform at no additional cost. The required hardware for project piloting is listed below.

2.1.1 Internet of Things (IoT)-based smart plugs

Specification	Description
Connectivity	Connects to 2.4 GHz, Wi-Fi 802.11 b/g/n
Dimensions	61.8mm x 99mm x 42mm
Power Input	100-240V ~ 50/60 Hz 16 Amp
Output	16 Amp Maximum load model & 25 Amp Maximum load model
Pin Standard	BS 546 Type M (Indian standard large three-pin)
Socket Standard	BS 546 Type D & M Combo (Indian standard large and small three-pin)

2.1.2 IoT based Smart Infrared (IR) Blasters

Specification	Description
Connectivity	Connects to 2.4 GHz, Wi-Fi 802.11 b/g/n
Dimensions	40mm x 56.2mm x 25mm
Power Input	5V, 1 Amp
Range	Up to 25m to the appliance
Infrared LED	4 Powerful IR LEDs, at 940nm and 20-60kHz

2.1.3 Customisable smart hardware unit for controlling EV charging loads

A centrally located wall-mounted EV charging controller that can control up to 10 E-rickshaw charging points during ADR event shall be provided. The hardware suppliers must provide necessary technical support for the successful integration of their hardware with the third-party ADR platform and other software. This shall include API calls, integration documentation and technical support as required. This support should be provided at no additional cost.

Specification	Description
---------------	-------------

Connectivity	GSM-based
Enclosure	IP65, tamper-proof
Maximum load per unit	50 kW

2.1.4 Smart Meters

Smart Meter requirements:

Electrical		
Connection type	Direct connected	Direct connected
Wiring configuration	Single-phase, two-wire	Three-phase, four-wire
Voltage range	230/240 V (L-N)	230/240 V (L-N), 460 V (L-N)
Current range	5-30A, 10-60A, 10-100A	5-30 A,10-40 A,10-60 A,20-100 A
Accuracy Class	1.0	1.0 or better
Mains frequency	50 Hz	50 Hz
Compliance		
Standards	IS 13779, IEC 62052-11, IEC 62053-21, IS 15959	IEC 62052-22, IEC 62053-24IS 14697, IS 15959
Meter constant	6400 imp/kWh, 3200 imp/kWh, 1280 imp/kWh	6400 imp/kWh, 3200 imp/kWh, 1280 imp/kWh
Mechanical		
Dimensions	Compact	Compact
Enclosure	Engineering plastic	Engineering plastic
Environmental		
Ingress protection	IP 54	IP 54
Surge withstand	10 kV	10 kV
Humidity	95% non-condensing	95% non-condensing
Temperature	-20 °C to +60 °C (operating), -25 °C to +70 °C (storage)	-20 °C to +60 °C (operating), -25 °C to +70 °C (storage)

Smart Meters should be compact single-phase and 3-phase for domestic and small commercial metering applications including net metering. The hardware suppliers must provide necessary technical support for the successful integration of their hardware with the third-party ADR platform and other software. This shall include API calls, integration documentation and technical support as required. This support should be provided at no additional cost.

Hardware shall be procured in batches of 100 where the procurer will buy a minimum of 100 units of each hardware to a maximum of 300 units of each hardware in a phased manner. The Tenderers shall follow the format in the Tender application form to submit the costs of hardware.

2.2 Software requirements

The software platform shall be used to facilitate the DISCOMs in conducting Automated Demand Response (ADR) within its distribution network. The software should make it convenient for DISCOMs to schedule, manage, track, measure and settle the ADR events with consumers. The software

platform should also offer an intuitive user interface that can be used by the consumers to manage their energy assets, participate in ADR events and manage their participation. Some of the main functionalities are given below.

2.2.1 Product Specifications

- 1) Application: Web app for DISCOMs and Mobile app for consumers
- 2) Comprehensive: Pre-publish, Post-publish, Counter bidding, Performance tracking and Customer management modules
- 3) Automated: Smart agent triggered control actions (AC – air conditioning temperature set, On/Off)
- 4) Contracts: Price and Capacity contracts, with customizable penalty terms for deviation
- 5) Notifications: Targeted communication between consumers and DISCOMs
- 6) Event Segregation: Segregated ADR event schedules & incentives for Residential and C&I (Commercial and Industrial) customers, including Feeder-wise / Region-wise event schedules
- 7) Customizable: Modular product design for improved flexibility
 - i) (Demand Response) DR parameters (gate closure time, bidding, order stacking, priorities etc.)
 - ii) Commercial (pricing, penalty) according to regulations in India

2.2.2 Detailed requirements

1. Consumer / DISCOM Onboarding

- i. Signing up of customers (residential, C&I) interested in Automated Demand Response
- ii. Completing KYC (Know-your-customer) comprising details of address, contact details, sanctioned load; generation capacity available; sources of power available; smart meter serial number, appliances at home level etc.
- iii. Registration of Smart Plugs, IR blasters and associated appliances for participating in the ADR
- iv. Integration with Energy meter and other consumer metering infrastructure for real-time monitoring and settlement of ADR
- v. Creating digital identities and addresses for the customers and registering them on the platform
- vi. Defining access levels and roles and responsibilities for key actors in the energy ecosystem
- vii. One-time password (OTP)-based login for Consumers and DISCOMs applications
- viii. Registering the DISCOMs and specifying the regions/substations where ADR shall be conducted

2. DISCOM Actions

- i. Uploading / Revising / Re-uploading DR Schedules by DISCOMs (96 time slots)
- ii. Classifying events into Peak Shave and Load Shift and publishing the DR schedules
- iii. Group of consumers (Region, consumer category, appliance category etc.)
- iv. Select the dates, events and consumer categories and publish the ADR events
- v. View / Manage customers (residential, C&I) that have signed up for ADR based on regions/consumer categories
- vi. View ADR event details and information on the flexibility requirements and flexibility offered by consumers
- vii. Accept/reject counterbids from customers for ADR participation

3. Consumer Actions

- i. Viewing scheduled events and participating in the desired events.
- ii. Selection of appliances for participation in a given event.
- iii. Opting in and opting out of participation until gate closure time including counterbidding for participation in a particular event.
- iv. Add new / modify existing appliances.
- v. View historical participation and outcome/incentives from a particular event participation.
- vi. Basic weekly, monthly reporting of consumer participation and the incentives earned.

4. Automation

- i. Notifications to be sent to consumers when an ADR schedule is uploaded or changed by the DISCOMs.
- ii. Ability for DISCOMs to send requests for participation and reminders to consumers who have not responded to ADR requests.
- iii. Automated notifications to consumers not participating as per their commitment
- iv. Consumer appliances shall be triggered automatically as per contracts, and trade to be validated using energy consumption information relayed by SMART meters.
- v. Trigger On/Off loads and appliances as per the ADR schedule and consumer participation.
- vi. Ability to change the temperature setting for AC in addition to switching On/Off.
- vii. Penalties could be levied on consumers for overriding the automated actions and not offering adequate relief to the utility during the time of the event.
- viii. Deficiencies or violations of the contract are identified, and suitable penalties are to be levied on the violating party based on the agreement.

5. Settlement and Closure

- i. Price and Capacity contracts, with customizable penalty terms for deviation
- ii. The aggregate bill (daily / weekly / monthly frequency may vary based on customer setting) will include all the charges (energy charges, network operator charges, penalties etc.
- iii. Item-wise charges for each transaction are also provided in addition to the aggregated monthly charge.

6. Other requirements

- i. Integrate with E-Rickshaw, E-Bus charging stations, Telecom towers, BESS and a variety of loads as per use case

2.3 Operational support

The company shall also provide necessary operational and maintenance support for the deployment of hardware and software solutions for the use cases and consumers selected by the DISCOMs.

2.4 Delivery timeline

The pilot shall be conducted in two phases and therefore the Hardware requirement, Software customization and delivery, and operation & maintenance services shall also be synced accordingly with these project phases. The total duration of the field pilot is up to 4 months this year (2 months in summer and 2 months in winter).

2.4.1 Hardware

Hardware should be delivered, and integrations completed within 2 weeks of the order being placed for the same by the project team. The hardware should be of high quality, standardized and used for the complete purpose of the project.

2.4.2 Software: deliverables

1. Mobile application for Consumers to participate in ADR campaigns
2. Web application for Demand Response Platform for DISCOMs to publish and perform actions
3. Algorithms for the activities required for executing an ADR
4. Software architecture for the Demand Response platform along with technical documentation
5. Integration of the platform with Smart meter and other IoT devices are required for field demonstration
6. Basic User manual, Troubleshooting guide and technical product documentation.

3. Administrative procedure

3.1 Eligibility criteria

3.1.1 Tenderers must provide their registration/incorporation certificate and legal structure.

3.1.2 Tenderers shall be excluded from participation in the procurement procedure if:

1. they are bankrupt or being wound up, are having their affairs administered by the courts, have entered an arrangement with creditors, have suspended business activities, are subject to proceedings concerning those matters, or are in any analogous situation arising from a similar procedure provided for in national legislation or regulations. However, tenderers in this situation may be eligible to participate insofar as the Grant Recipient (SIN) can purchase supplies on particularly advantageous terms from either a supplier which is definitively winding up its business activities, or the receivers or liquidators of a bankruptcy, through an arrangement with creditors, or through a similar procedure under national law;
2. they or persons having powers of representation, decision-making or control over them have been convicted of an offence concerning their professional conduct by a final judgment;
3. they have been guilty of grave professional misconduct; proven by any means which the Grant Recipient can justify;
4. they have not fulfilled obligations relating to the payment of social security contributions or taxes in accordance with the legal provisions of the country in which they are established, or with those of the country of the Grant Recipient or those of the country where the contract is to be performed;
5. they or persons having powers of representation, decision-making or control over them have been convicted for fraud, corruption, involvement in a criminal organisation or money laundering by a final judgment;
6. they make use of child labour or forced labour and/or practise discrimination, and/or do not respect the right to freedom of association and the right to organise and engage in collective bargaining pursuant to the core conventions of the International Labour Organization (ILO).

3.1.3 Tenderers shall confirm in writing that they are not in any of the situations listed above. Even if such confirmation is given by a tenderer, the Grant Recipient shall investigate any of the situations listed above if it has reasonable grounds to doubt the contents of such confirmation.

3.1.4 Contracts shall not be awarded to tenderers which, during the procurement procedure:

1. are subject to a conflict of interests
2. are guilty of misrepresentation in supplying the information required by the Grant Recipient (SIN) as a condition of participation in the tender procedure or fail to supply this information.

3.1.5 Preference shall be given to any tenderer with prior experience of conducting ADR pilots with multiple DR strategies, with at least two utilities in India.

3.1.6 Preference shall be given to tenderer who has knowledge and experience of the Indian energy market and regulations for their ADR solutions are encouraged to apply but not limited to.

3.1.7 Solution providers offering turnkey solution (software, hardware and maintenance support) for the duration of the project shall be preferred.

3.1.8 Preference would also be given to vendors with demonstrated experience of developing solutions based on Energy 4.0 technologies (for example, IoT, Blockchain, Data Science, etc.) for the power sector.

3.1.9 Previous experience of working on collaborative projects with international research and intergovernmental development agencies is a plus.

3.1.10 Preference shall be given to vendors with a clear intent to contribute technically and put sweat equity (relevant effort) into the project with an intent to strengthen the ecosystem for ADR.

3.2 Evaluation process

We shall follow QCBS (Quality and Cost Based System) for selecting the winning tenderer.

Stage-1: Those who qualify in Part-I- Mandatory Criteria will be eligible for opening of Part-II- Technical Bid

Stage-2: Opening of the Part-II- Technical Bid: Tenderers shortlisted in Stage-1 shall evaluated on the Technical parameters by the evaluation committee, as per criteria mentioned in the Technical bid evaluation matrix below. At the end of this stage, each tenderer will be assigned a Technical score (out of 100). Tenderers scoring less than 70 in the Technical bid will not be considered for opening the price bid.

Evaluation Criteria for Technical Bid:

Category	Sub Factor	Criteria Score (Max)	Section Total (Max)
Product	1. ADR solution developed indigenously according to the regional regulatory regime in India	5	

	2. Offering turnkey solution (software, hardware and maintenance support)	15	40
	3. Offers comprehensive product functionality (listed in the tender call)	15	
	4. Product is easily customizable and scalable beyond the project	5	
Relevant Experience and Industry Network	5. Have developed Energy 4.0 solutions (for example, Blockchain, IoT and AI/ML) based products for power sector	10	45
	6. Have conducted Automated Demand Response pilots with DISCOMs (DSOs) in India	20	
	7. Worked on collaborative projects with international research and intergovernmental development agencies	15	
Transfer of Knowledge and Capacity Building	8. Has organized training and capacity-building workshops in the ADR area	5	5
Project Continuity & Team Enterprise	9. Does the tenderer stand to have strategic business interest and clear intent to strengthen the ecosystem for ADR	5	10
	10. Is the tenderer willing to contribute sweat equity into the project	5	

The tenderers are requested to prepare their own technical proposal according to the specified format provided & the supporting documents wherever applicable as per the programme requirement may be provided. The Technical evaluation would be broadly based on the categories as stipulated above. The tenderer is free to add any information that can help in assessing the technical quality of the solutions proposed and which touches upon the above-given parameters/attributes.

Stage-3: Opening of the Part-III- Price bids: Only Price bids of firms clearing Stage-1 & Stage-2 will be opened for cost evaluation.

For the sake of uniformity, Price Bid shall be submitted in the format provided by SIN in DREAMS_Tender_Application_Form.

3.3 Selection criteria

Tenderer shall submit the technical bid along with financial bid. Each tenderer clearing the mandatory criteria shall be weighted by the evaluation committee based on the technical parameters and criteria set forth in the Technical Bid. Price bids will only be opened for those tenderers who score 70 and above in the Technical Bid evaluation. Clarity of thought on ADR and project implementation is

Note: This project has received funding from the Norwegian Ministry of Foreign Affairs (Royal Norwegian Embassy, New Delhi)

expected from the tenderers. The weightage of Technical bid will be 70% and that of Financial bid will be 30%. The following evaluation process will be followed.

The tenderers are expected to have a price bid of around 800,000 NOK (Norwegian Krone). However, the evaluators could consider additional criteria in the selection process for better implementation of the project. Further, the lowest cost tenderer (L1 Tenderer) shall be given a financial score of 100. Similarly, proposals with the highest technical score will be given a score of 100. The total score, both technical and financial, shall be obtained by weighing the quality and cost scores and adding them up. Based on the combined weighted score for quality and cost, the tenderer shall be ranked in terms of the total score obtained. The proposal obtaining the highest total combined score will be ranked as H1, followed by the proposals securing lesser marks i.e. H2, H3 etc. The proposal securing highest combined marks and ranked H1 will be invited for awarded the contract after negotiations. In the event that two or more bids have the same score in final ranking, the bid with highest technical score will be treated as the successful tenderer.

If the number of Tenderers responding to the tender is less than three, and SIN still wants to continue with the selection process, the selection of that single Tenderer may be done in line with SIN guidelines:

- a) SIN or its authorized representative can seek clarifications/documents required in connection with the bid.
- b) Successful tenderer will be selected based on the evaluation criteria set forth in the “Bid Evaluation” section above.
- c) SIN reserves the right to negotiate the rates with successful tenderer.
- d) After selection, a Letter of Award (the “LOA”) shall be issued, in duplicate, by SIN to the Selected Tenderer and the Selected Tenderer shall, sign and return the duplicate copy of the LOA in acknowledgement thereof. In the event the duplicate copy of the LOA duly signed by the Selected Tenderer(s) is not received by the stipulated date, SIN may, unless it consents for an extension of time for submission thereof, make an offer to the next ranked tenderer.

The decision of the evaluation committee is final, and it reserves the right to summarily reject all the bids without assigning any reason whatsoever if they are not in line with the committee’s expectations.

3.4 How to apply

Participants are requested to carefully read and follow the instructions:

1. Review the Eligibility Criteria to make sure your company is eligible.
2. Review the Mandatory Documents to make sure you provide all documents with your application.
3. Submit your complete proposal (including the mandatory documents) via e-mail to open_tender@smartinnovationnorway.com by the deadline of **1st of April 2024, before 15:00 (Central European Time - CET)**. All written and oral communication related to this procurement shall be conducted in English. This language requirement also applies to the Tender itself.

3.5 Mandatory documents

The following mandatory documents need to be submitted for evaluation. Tenderers not submitting any of the below-mentioned documents shall be summarily rejected without any further evaluation

- (a) DREAMS_Tender_Application_Form
- (b) Company Registration Certificate / Incorporation Certificate
- (c) Tax registration documents, details and organisation number
- (d) Signed and Scanned Undertaking on Ethics (Annexure-1)

3.6 Procurement Agreement

Once a finalist has been selected, a procurement agreement will be signed with Smart Innovation Norway. Kindly note that the quotation includes VAT if your company does not have a VAT exemption. Checking the consistency between these costs and the expected work of the project will be part of the evaluation. Payments terms:

For Hardware:

Procured in batches of 100, 50% upfront and 50% after receiving the hardware by DISCOMs (DSOs).

For Software:

50% upfront, 25% after finishing summer and winter pilots, and 25% before the end of the project and completion of services (separate for customization and O&M).

4. Contact Persons

For Technical Queries:	Name: Srinivas Cherla Email: dir-sa-rich@telangana.gov.in	Name: Alemu Belay Email: open_tender@smartinnovationnorway.com
For General Queries:	Name: Alemu Belay Email: open_tender@smartinnovationnorway.com	