## FACILITY FOR LOW CARBON TECHNOLOGY DEPLOYMENT

### GEF BEE UNIDO Project

### *Innovation Challenge for Industrial IoT Application in Industries*

The **Facility for Low Carbon Technology Deployment (FLCTD)** project**,** implemented by the United Nations Industrial Development Organization (UNIDO) in collaboration with the Bureau of Energy Efficiency (BEE) is announcing the launching the 2020 Innovation challenge.  The information of the earlier innovation challenges concluded in 2018 and 2019, can be found on: https://low-carbon-innovation.org/2018-winners.

Entries are invited to the 2020 FLCTD Innovation Challenge to identify promising innovative Industrial Automation solutions, which can be deployed in Micro, Small and Medium manufacturing industries. The solution should address technology gaps for, real-time monitoring and mobile reporting of parameters of equipment and processes to reduce energy consumption, increase productivity.

Solutions should demonstrate new automation concepts and solutions to address the following use cases and Expected Outputs listed below. The first two use cases are mandatorily required. The solution may have additional features to assist productivity improvement such as, but not limited to, tracking and maintaining operational health and safety requirements in the unit.

| Use case | Expected Outputs |
|---|---|
| Improve Energy Efficiency | • Track and reduce idle running of equipment while not in use<br>• Track efficiency of equipment and Specific Energy Consumption of unit/plant |
| Energy saving through Production Optimization | • Optimize the Production process<br>• Decreasing interruptions in production processes, Scheduling manual/autonomous operations |
| Reduce Wastage of Raw materials and Emissions | • Monitor, Input quality Control, Producing Quality Products<br>• Optimization of Resources utilized<br>• Monitor emission levels to meet Government Regulations |
| Improve Productivity | • Analytics, track machine conditions and reduce down time<br>• Monitor KPI to track production improve<br>• Track anomalies in Production process and quality of intermediate products to reduce rejection of finished product |
| Personnel, Equipment and Plant Safety | • Assist in tracking the Operational Health and Safety<br>• Track storage, use and disposal of hazardous chemicals<br>• Defense in-Depth Strategy |

| Maintenance | • Condition based maintenance (CBM) |
| --- | --- |
| | • Analytics, Optimization of Maintenance schedules |

The proposed solution should have
- Components to report Faults, Configuration data of Equipment (ISA-95 Standard),
- Accounting for Resource Consumption and Emissions,
- Performance Metrics, and
- Security of systems and data.
- *<critical energy related information KPI to be tracked??>*

In addition, the innovative solution for Industrial Automation should be able to demonstrate unique features for the following functionalities and present it in the attached matrix. For each functionality indicate Technology Readiness Level *(Refer to the scale on page 4 to be added)*.

a) **Sensors and Measurements:** Sensing critical parameters of industrial equipment and environments**.** Innovations should be able to demonstrate how it is monitoring, automating and optimizing the operational aspects with in Plant's Operating environment and use Edge computing and IT (cloud) based systems while interfacing with OT sensor world directly or via PLC and SCADA based systems.

b) **Storage systems**: The data generated within operational environment depending upon how much data, how frequently it is measured by the proposed solution, may turn in to Big Data. The storage solution both at edge and in the cloud should be designed accordingly. The storage needs of the solution and its objectives needs be reflected in the proposed design. How sensor as well as processed data and results of Edge/Cloud computing analytics are stored and the purpose behind such storage, needs to be stated as part of solution.

c) **Computation systems:** How sensed data is computed in Edge environment and Alarms are raised, any proposed analytics to detect anomalies in the time series trend data of critical parameters monitored as part of solution. Describe any innovation how it adds value to monitoring, controlling, automation and optimization activities using edge or cloud computing techniques.

d) **Communication systems:** Describe how the sensed data is being transmitted, what are design consideration like data rates, band widths, security, real time /offline while choosing particular network protocols. Necessary solutions and their specific capability to interface with PLC and SCADA systems using Open Process Control (OPC) compliant interfaces. Communication interfaces in similar lines with Cloud computing environment needs to be reflected. Ability to demonstrate working model while substantiating the innovation aspects of within the proposed implementations.

e) **Reporting systems:** The proposed solution needs to reflect the facts that, how it is handling Faults, Configuration changes of equipment, Accounting (Metering of Resource consumption and emissions) and proposed performance metrics and security related incidents are reported. The proposed solution should follow Responsible, Accountable, Consulted and Informed (RACI) model

while information is disseminated. Also, dashboard and mobile reporting should be uniform interfaces and it designed and customized in consultation with OT environment.

f) **Data and System Security:** Security of Systems preferably equivalent to Defense in Depth strategy, with in operational environment needs to be addressed as part of solution, besides security of Edge and Cloud computing systems. In additions to this all interfaces with machinery and computing systems needs to be bridged with security layers in while data is in communication. The data privacy needs to be handled across the value chain.

### Incentives for Participation

- **Grant** up to USD 50,000 for winning technology demonstration at multiple locations
- **Performance Verification** to establish the efficacy of innovative technology in-field working conditions
- **Business Acceleration and Mentoring** support from industry experts
- Opportunity to **Network** with investors and industry stakeholders to publicize the innovation
- The winners of the Innovation Challenge will receive recognition from Bureau of Energy Efficiency and UNIDO
- Award disbursement will be linked to specific milestones
  - 30% of the award grant will be given to the innovator winning the innovation challenge
  - 50% after installation/commissioning of the innovation
  - 20% at the end of the deployment phase, upon completion of Technology Verification Reporting

## Eligibility and Qualifiers

All innovative solutions should be based on the proof-of-concept or early stage prototype and clearly indicate the technology gap being addressed.

- Nature of innovation (Product design/Process Innovation)
- Addresses a key issue/technology gap in the industry
- Replication potential
- FCAPS Compliance (fill up the matrix on next page)
- Technology readiness stage (R&D/ Prototype/Pilot demonstration/Commercial)

## Who Can Apply?

- The innovation challenge is open to Entrepreneurs, Startups, Indian Technical Institutes / Universities, Research Institutes, Micro, Small and Medium Enterprises.

- Consortiums of entrepreneurs and academic institutions with industry partnerships are highly encouraged to participate in the innovation challenge.

- Team which has viable working solution with necessary hardware and software in place. Those solutions which are already implemented in factory environment will be given first preference after they found compliant with proposed guidelines outlined as above.

  - Innovation teams with **women entrepreneurs** will be given preference.

| Define your Innovation | IT/OT | Compliance *Monitor/ Control/ Automate/ Optimize* | Description of key features | Technology Readiness Level[1] |
|---|---|---|---|---|
| **Faults** | • Define and handle Domain/Process specific faults and failures;<br>• **Handling** Faults & Failures, Anomalies in Equipment & Utilities | | | |
| **Configuration** | • Standard Equipment and measurement model ISA 95;<br>• **Equipment** Database and Real time Equipment Uptime and Downtime other Status updates | | | |
| **Accounting** | • Interfacing with Critical Resources and emissions and their source of data from the Filed;<br>• **Time** Series data with respect to utilization of resources and inventory levels, output products and emissions | | | |
| **Performance** | • Define and handle Domain specific Process Performance Parameters;<br>• **Define** Performance Metrics and track | | | |
| **Security** | • Physical and Equipment Safety Read-only Data across;<br>• **Boundaries** of Fieldbus and IT networks;<br>• **DiD** Strategy implementation as an example. | | | |

[1] Refer Technology Readiness Level diagram at the end of this document

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**General Guidelines, Terms, and Conditions**

- Participant shall submit solutions/product designs owned by them or to which they have right to claim and use as owned by them. Suitable documents to this effect must be submitted along with the entry.

- Participant shall ensure that any submission made in the Challenge does not violate any of theirs or any third party's intellectual property rights, confidentiality, trade secret and violate any statutory provisions.

- BEE, UNIDO, its employees, members of Expert Panel and organizers of this innovation challenge shall in no event be liable for any violation of IPR, or license or permits required from third party.

- Participant shall not assign any rights, obligations, or privileges hereunder without the prior written consent of Organizers of the Challenge.

- BEE, UNIDO, Organizers, members of Expert Panel, supporting organizations or any employee or agent shall not be liable for, any costs incurred or loss or liability or loss in expectation of profits or loss due to failure of understanding the terms and conditions of the Challenge or of any expected benefit of the participant in relation to entry and submission in the Challenge.

- By way of selecting the entries for evaluation at any Stage or for Final Award, Participants shall not be entitled to claim or have got endorsement from BEE and UNIDO of any sought whatsoever, or have earned approval of any sought whatsoever of BEE and UNIDO, for use in any form whatsoever anywhere in the Industry.

- At any Stage while evaluating the entries, organizers shall be free to contact the Participants and carry out discussions on the matter submitted by the Participants and seek clarifications. Any solicitation by participants in whatever form in respect of their entries shall not be entertained and entries of such participant shall be disqualified from the Innovation Challenge.

- BEE/UNIDO/Organizers may change the Terms and Conditions of participation at any time without prior notice. It shall be sole responsibility of the Participants to update themselves of information posted in the website from time to time.

- BEE/UNIDO/Organizers may disqualify a Participants from the Challenge for breach of any of the conditions of this Challenge, or discontinue this Challenge.

## Innovation
## Technology Readiness Level



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