

Proof of Concept Project No: SIAA/RFI/131002

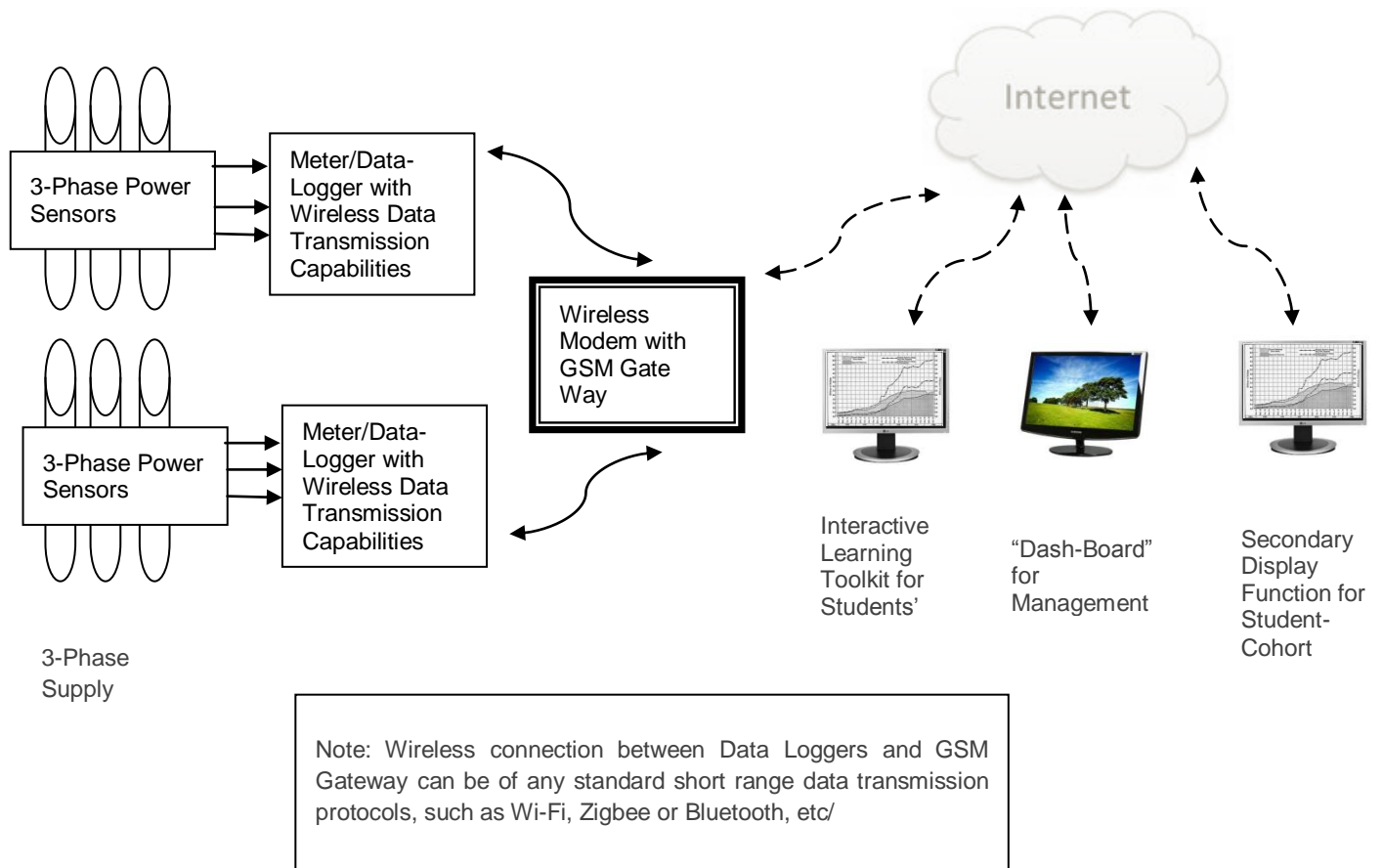
Project Name : Energy Monitoring System for Schools

Department: NA

A. PROJECT OBJECTIVES

1. The objective of this project is to develop and deploy real-time interactive electrical power monitoring systems to 10 schools in Singapore, to improve their productivity by reducing energy consumption.
2. Provide consultancy to their staff to reduce the schools' annual energy consumption by at least 30%

B. SYSTEM FUNCTIONAL BLOCK DIAGRAM



C. SYSTEM FUNCTIONAL SPECIFICATIONS

1. Electrical energy consumption is to be monitored continuously, 24 hours a day, 7 days a week for a period of at least 12 months.
2. Electrical energy consumption data must be measured in real time at a minimum interval of every 60 seconds, with no more than 60 seconds lag time between data capture and data availability on the teacher and student portals.

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3. The sensors/data loggers used to monitor and record the data must only use ONE GSM gateway (per school) to send data to one common, cloud-based system for processing. System will have the capabilities to record and analyze consumption patterns and identify high consumption areas for each school.
4. The meter/ data logger must have a storage capability that allow the energy data to be stored and retrievable for the last 12 months in the event should communication connection is not working.
5. System must have the capability to compare energy consumption patterns between schools for advanced learning and sharing.
6. System will have the capability to compare and analyze energy consumption patterns between Singapore schools and schools in other countries/regions of the world.
7. The cloud-base central system will store, collate and process the data, so that reports and alerts can be generated.
8. The reports are user configurable and are able to be exported into Microsoft Excel, PDF, and CSV formats.
9. The online user platform must contain an interactive student learning portal with all real-time graphs and relevant data, intuitive units for easy understanding with interactive guided lessons for math, science, and social studies.
10. The online user platform must contain a teacher/staff management portal with all real-time graphs and relevant data, lesson guides, customizable reports, and real-time configurable alerts.
11. The online platform must have the capability to share the real-time energy data to a well-visualized public display module to allow visitors to view the profile.
12. The alerts are user configurable and should be distributed by email, text message or other common text-based chat applications (such as Twitter, Whatsapp)

Note: Vendor must state clearly the wireless sensor network topology and monitoring strategy in order to meet the energy reduction goals in this project.

D. CONSULTANCY AND TRAINING

The vendor will have to conduct a well-supported broad-based student education and engagement program to provide consultancy service to the staffs and students to achieve the stated objective.

The engagement program should include, but not limited to, the following:-

1. Student learning workshops,
2. Stakeholder training sessions with teachers and administrators
3. System training and consultancy session with operational staffs to devise energy reduction policy
4. Full school engagement program and targeted awareness campaigns

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E. PROJECT DELIVERABLES

1. Electrical energy data gathering and monitoring hardware, consisting of, but not limited to¹-
 - a. Electrical energy sensors supplied per school (please specify type and quantity)
 - b. Meter/Data-Logger with Wireless Data Transmission Capabilities
 - c. Wireless Modem with GSM Gate Way
 - d. GSM SIM cards with 12 month pre-paid subscription for data
2. Cloud-base System Software, that is able to²:
 - a. Generate real-time energy consumption graphs, learning tools, and analysis opportunities for teacher and student access
 - b. Generate real-time alerts when energy exceeds predetermined conditions
 - c. Generate regular, customizable reports for sharing with the students/staff of the school
 - d. Compare school energy consumption with that of other schools
 - e. Multiple Users Interface to allow students, teachers and system administrators to login into system with access rights defined by a super administrators.
3. Provision of tested curriculum for teachers' and students' use in the classroom and lesson
4. Conduction of student workshops, focused training sessions, and awareness events
5. Generate a Final Project Report on energy usage and productivity gain at the end of 12 months monitoring period
6. 12 months service support for system hardware and software.

F. REQUIRED TECHNICAL CAPABILITIES OF COMPANY

System Integration work with cloud-based, wireless and sensor network knowledge. Familiar with Singapore's National Movement for Green School Programs and Initiatives.

G. PROJECT DURATION

4 weeks

H. OTHER REQUIREMENTS

Non Disclosure Agreement (if required)

Not Required

¹ Please specific complete list and quantity in the final quotation.

² Please enumerate addition System Software features, if applicable, that will help the schools to reduce energy consumption