

Feasibility Studies with the Aim of Developing  
Joint Crediting Mechanism FY2014

# **Feasibility Study on Energy Conservation in Data Centers Adopting Energy Management System and Other Energy Efficient Facilities in Indonesia**

New Energy and Industrial Technology Development Organization (NEDO)  
NISCOM Inc./NTT DATA INSTITUTE OF MANAGEMENT CONSULTING ,Inc.

## Feasibility Study on Energy Conservation in Data Centers Adopting Energy Management System and Other Energy Efficient Facilities in Indonesia

Implementing Agencies: NISCOM Inc./NTT DATA INSTITUTE OF MANAGEMENT CONSULTING ,Inc.

Energy conservation will be achieved by introducing Japanese high-efficient equipment to data centers. Considering rapid increase of data centers in the future, this project has a large potential of GHG reduction.

### Summary

GHG reduction effect is planned to be achieved by introducing Japanese high-efficient equipment in existing or new data centers, including energy management system, high efficient server, high-voltage DC system, intelligent A/C, an so on.

### Survey Items

- 1) Current situation of market and policy(climate change, data center business, etc.) in Indonesia
- 2) Feasibility evaluation
- 3) Identification of the MRV methodology
- 4) Economic and GHG reduction ripple effect

### Partner/Site

- Republic of Indonesia  
(Data Center Business Entity)



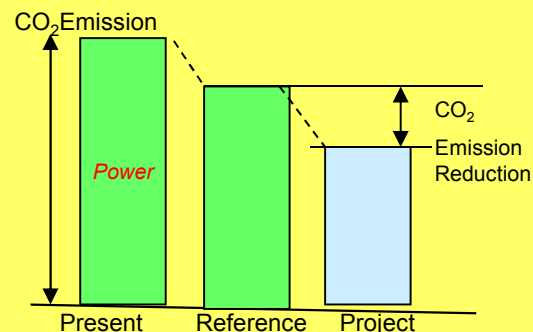
### Estimated Reduction Amount

**40-160 ktCO<sub>2</sub>/year**

(Estimation based on the assumption that this system is deployed to all of the data centers in Indonesia)

#### Reference Emission

- Energy conservation measure is not fully implemented and low efficient server, A/C, and so on are installed
- Reference emission is calculated based on the default value of improve rate of PUE and others, which is multiplied by BAU emission.



#### Project Emission

- Amount of electricity consumption is reduced by installing energy management system, high efficient server, high-voltage DC system, intelligent A/C and so on.
- Measuring the amount of electricity consumption of whole data center or each equipment

Technology Outline

Appropriate technologies will be selected from the following list, based on the result of field survey.

Energy Management System



**Automatic-calculation function of DPPE index, monitoring power consumption of facility equipment and ICT devices, and data center management system with remote control function.**

By collecting all detailed data in DC and visualize all power consumption down to individual server level, power consumption will be saved by 10–15%. DCM software provided by Intel will monitor power consumption and it's vendor agnostic for server.

High-Voltage Direct Current Power Supply System



The system is composed by HVDC commutating device, distribution board, and so on.

**Compared with UPS, it delivers about 20% reduction of power consumption, and 10 times improvement than usual MTBF (Mean Time Between Failures).** Applying HV power supply can reduce costs and number of devices that are usually installed in around PDF/other power supply area.

Direct Current Server



The server which is compatible with HVDC power supply. **Efficiency of built-in power unit in server exceeds 90%, and compared with conventional server, it reduces 40% of power consumption.** Also provides built-in battery server.

Energy-Saving Server, Server with HTM



**The leading-edge energy-saving server, and well-operational server in HTM environment (set up AC temperature from 23-30°C). These devices reduce power consumption of the server by 35-40%, and also reduce AC load.**

AC with Add-on Inverter



Installing the add-on inverter controlled by PLC realizes energy-saving operation which saves energy consumption by 20-30% compared with conventional ACs. **It delivers low initial cost, utilizing existing control tech and manufacturing tech, and turns out initial cost is about half the price compared with other similar solutions in the market.**

Intelligent AC System



Several wireless sensor modules for temperature are installed at the inlet side of the rack, and the data of temperature is collected to the wireless gateway through the wireless network. **The AC is automatically controlled based on the data from those sensors, and it saves power consumption of the AC by about 30%.**

High-Efficient Local AC



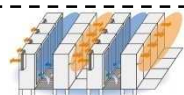
**Local spot AC that is put in the line of racks that its temperature usually goes up easily, delivers more efficient cooling.** It saves power consumption by up to 50%.

High-Efficient Generator



**A gas engine that has the world's top level generating efficiency in energy and environmental design.** It's flexible to scale and easy to be fit/customize to each DC scale. It also takes advantage of features of a gas engine realizing a **rapid start-up that goes to 100% operational status within 10 minutes.**

Hot-Aisle & Cold-Aisle Isolation



By isolating hot area(outlet side of rack) and cold area(inlet side of rack) in server room, it can stop mixing up heat-air and cold-air, and optimizes AC efficiency more. Multiple enterprises have this tech/solutions.