

PROJECT FACTS

Reducing CO2 Emission by effective micro turbine co-generation technology



- Project name : The Microturbine Cogeneration Technology Application Programme (MCTAP)
- Total budget : USD 3,012,300
- Project Period : 2008 - 2013
- Implementing Partner : Agency for the Assessment and Application of Technology (BPPT)
- Donor : GEF
- Location : National

Background

Indonesia faces an ever-increasing demand for electricity. It is estimated that between 2000-2005, the demand for electricity grew 4.5 times. To cope with this demand, Indonesia launched an ambitious plan to boost its existing power generation capacity by a further 10,000 megawatts (MW).

Since 1999, the Government of Indonesia has advocated for a gradual shift from diesel-based generation, and put its priority on alternative energies, including renewable energies. However, there are factors that impact the effective utilization of alternatives to oil.

These include the distortion of oil prices, barriers in the transfer of applying alternative technologies, and the existing national energy market, which is predominantly oil based.

This situation has gradually changed since the global increase in oil prices, and the gradual removal of national oil subsidies, which have significantly inflated energy production costs. Indonesia is now aggressively pursuing ways of producing energy cheaply and efficiently, and reducing national greenhouse gas emissions.

To enable this, the United Nations Development Programme (UNDP), in partnership with the Agency for the Assessment and Application of Technology, is promoting a new technology: microturbine cogeneration technology (MCT). This technology offers a double benefit to users: it produces energy more efficiently than a conventional diesel generator, and it releases a fraction of the CO2 emissions of a diesel generator. This is possible because the technology utilizes cleaner and more economical natural gas to efficiently generate electricity and heat at the same time.



The energy consumption of a sugar mill can be made highly efficient by utilizing microturbine cogeneration technology (MCT). Photo credit: Laksmi Noviera, UNOCHA.

The technology is best suited to medium-scale industrial activities that require both heat and electricity, such as textile mills, palm oil refineries, and pulp and paper mills.

It also has applications in housing estates, hotels, apartments and hospitals. It is expected that technology transfer and its effective application will secure microturbine cogeneration technology a place in the medium-scale segment of the national energy market.

Donor:



Objectives

This programme, called the Microturbine Cogeneration Technology Application Programme (MCTAP) aims to:

- Facilitate an effective transfer and application of microturbine cogeneration technology and equipment to medium-scale industries throughout Indonesia.
- Facilitate the eventual lowering of initial investment costs for microturbine cogeneration technology usage in Indonesia, thus enabling and promoting more widespread commercial application.

Results

The spread of the use of this technology is expected to have a self-propelling effect: as it is used more widely in Indonesia, the costs of initial investment will be driven down, which in turn will enable its adoption even more widely.

MCTAP facilitates demonstrations of the technology to help provide critical knowledge and commercial references for market players in public and industrial facilities, including high-rise residential and commercial buildings.

Microturbine cogeneration technology: A cleaner, more efficient source of energy

Microturbines have the unique ability to produce electricity and heat simultaneously. When both of these products are used, it is called cogeneration. Most microturbine operate on natural gas, propane, or diesel.

Conventional sources of power for electricity and heating consume 50 percent more fuel and produce much higher emissions than a typical MCT appliance for the same output of energy.

With an 80 percent heat and power conversion efficiency, an MCT appliance can convert an input equivalent to 230 kilowatt (KW) fuel into 120 KW of heating that goes into a boiler and 65 KW of electricity, with only 65 percent of the CO₂ emissions of a conventional system.

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