

# Turns Recycling Waste into Renewable Energy

**Whoever controls the technology related to renewable energy today, controls immeasurable business opportunities in the future.**

According to the "Renewable Energy Development Act" announced by the government in 2009, the so-called biomass energy means "energy produced by directly using or indirectly processing forestry plants, biogas and domestic organic waste." Currently, the applications of biomass energy in Taiwan focus mainly on electric power and fuel. Regarding electric power, there is a lack of private development and investment interest due to quite limited profits. As for fuel, both biodiesel and bioethanol are included.

In addition to wind power, MIRDC has also invested in the R&D and application of biomass energy technology and made many breakthroughs. With the financial support of the Bureau of Energy, MOEA and MIRDC completed the pre-study of supercritical methanol transesterification of biodiesel technology in 2009 and developed continuous reactor and system design technology accordingly. In 2011, MIRDC formed the "Green Energy Technology Development Strategic Alliance" with CPC Corporation in order to develop the technology and production equipment of supercritical methanol transesterification, based on palmitoleic acid as the source of material. The project is expected to effectively reduce the costs of raw materials. Meanwhile, CPC Corporation also introduced the

second generation diesel which was developed proactively by MIRDC's hydrogenation equipment. The second generation diesel, which is also called "green diesel," can also be applied in air transportation.

As for bioethanol, MIRDC developed a patent of high-pressure carbonated water hydrolysis in order to make a breakthrough in the material pre-treatment technological bottleneck of domestically produced cellulosic bioethanol (lignocellulosic biomass). In addition to recycling carbon dioxide used for industrial purposes, enzyme consumption can be reduced while the hydrolysis time can be shortened as well. In this way, the cost of biomass pre-treatment can be reduced substantially so as to create profit margins.

Under the double pressures from petrol prices and carbon reduction, countries around the world, including Taiwan, are accelerating their pace in the development of renewable energy. In the future, MIRDC will endeavor to cooperate with the clean renewable energy policy and promote the development and utilization of green energy. In the meantime, MIRDC will strive to reach the ultimate balance of energy, economy and ecology for the purpose of sustainable development.