

# The news revealed on “The Chemical Daily” described about the biodiesel production technology from RECYCLE ENERGY CO., LTD.

Here is the translation for the news.

Feb. 22nd, 2011

## Technology of High Efficient Biodiesel Production Proved by RECYCLE ENERGY

### Low Cost and No Glycerin as By-product Derived

RECYCLE ENERGY CO., LTD. (located in Fukuyama City, Hiroshima), as a venture corporation of environment management, has proved the technology to derive biodiesel with high efficiency from a variety of feedstock such as waste cooking oil and fat-contained biomass.

The catalytic cracking production plant is expected to be on sale within year 2011. Advantages include less limitation on the ambient temperature due to the low pour point compared with the traditional method “transesterification process”, and no glycerin derived as the by-product.

The wide-ranging feedstock and the fulfillment of lower costs will be the sales points during promotion.

A large-scale testing machine which can convert 150kg of the waste cooking oil per hour is to be completed around March.

The company will pick up its pace to develop the best catalyst and to collect the necessary data. The plant to be on sale will be designed to process 100-400kg per hour. The yield is so far 70% (80% against the theoretical yield) and they are working on a better one.

The derived biodiesel doesn't have to blend with other fuels. The plant will be commercialized within this year and the targeting market is food manufacturer/dealers and collection traders of the waste cooking oil from home and abroad.

When it comes to biodiesel production, most people mix the waste cooking oil with methanol and after the chemical bond of ester derives fatty acid methyl ester, which is known as the transesterification process. There are many problems waiting to be solved concerning this kind of process. Firstly, the pour point of the biodiesel produced by this method is about 20 without any additive and only a limited region in north hemisphere is allowed to use it. Moreover, there is 25% of glycerin

against the feedstock (per weight) as by-product. The derived methyl ester has to be refined and cleaning process is also indispensable.

On the other hand, the technology “catalytic cracking” that RECYCLE ENERGY proposes provides a solution to the above problems. By using the new technology, the pour point of the biodiesel is about -15, which allows less limitation on the region. It doesn't require refinery or cleaning and this makes it possible to lower down the cost. The feedstock includes waste cooking oil, oil seeds such as sun flower and palm, animal fat, and non-edible vegetable oil such as jatropa.

Inquires about the plant have been coming from Japan, China, Korea, Malaysia and etc.. Additionally the company sees a high potentiality in India, where producing biodiesel from jatropa has been very prevailing.

環境

バイオ燃料

高効率製造技術を確立

グリセリン副生なく低コスト 11年中に装置販売

リサイクルエナジー

環境ベンチャーのリサイクルエナジーは、広島福山市に、廃油や油脂を幅広く原料から効率よくバイオ燃料（バイオセル）を製造する技術を開発した。2011年中に、接触分解方式を採用した製造装置の販売を開始する。エステル交換法で製造するバイオ燃料に比べ流動点が低いため、使用が気候条件に左右されにくく、製造工程でグリセリンが副生しないなどのメリットがある。原料多様化や製造コスト低減をアピールし、装置販売を目指す。

リサイクルエナジーは「廃食油とメタノールを原料として投入し、エステル交換で脂肪酸メタノールエステルを生成するエステル交換法が主流。しかし、この方法で製造するバイオ燃料は、添加剤なしで使用できる最低気温条件（流動点）が約20度で、北半球では使用可能地域が限られる。製造工程で投入原料の25%（重量ベース）のグリセリンが副生するに加え、メタノールエステルの精製や水洗浄工程が必要で装置が複雑になるなどの課題もあった。

リサイクルエナジーの接触分解法で生産するバイオ燃料の流動点はマイナス約15度と、多くの地域で使用が可能となる。精製や洗浄も不要で装置を簡素化でき、製造コスト低減につながる。原料には廃食用油のほか、ひまわりやパームといった油糧植物、動物性油脂、ジャトロファなどの非食用油糧植物を投入できる。同社の装置には、国内に加え中国や韓国、マレーシアなど海外からも引き合いがある。同社シヤトロファを原料にバイオ燃料を多く製造しているインドでは、同社の接触分解法装置の優位性を生かせるという。