

The Current Status of "Green Chemistry" in Japan

Green Chemistry is the use of chemical technology to reduce or eliminate the use or generation of hazardous substances in the design, manufacture and use of chemical products.

"Strategic Forum for Green Biotechnology" was organized in 1999 to promote green chemistry in Japan. In 2000, the forum proposed a plan for implementing the principles of green chemistry in the Japanese chemical industry. The following goals for 2010 were outlined in the plan:

• **Introduction of biotechnology into the chemical industry.**

The chemical industry accounts for 13% of energy consumption in Japan. It was estimated that if biotechnology were utilized in 30% of current chemical processes, 1% of total energy consumption in Japan would be saved. The market for products in this sector resulting from the use of biotechnology was estimated to be \$70 billion.

• **Utilize biomass as an alternative energy source to petroleum.**

A reduction of 4 million kilo liter of petroleum could be realized by 2010 if 20% of Japan's energy consumption could be supplied from gas produced from biomass. It is estimated that a \$20 billion market would be established.

• **Development of new technology.**

The development of environmental analysis, bioremediation and biotope technology to measure and detoxify pollutants will result in a \$40 billion market by 2010.

To achieve these goals, the report concludes that development of technology to 1) produce artificial microorganisms with the minimum genome required for growth and to carry out the required process, 2) screening for super enzymes and super microorganisms with unique properties and 3) construct gene libraries from microorganisms that grow under extreme conditions, will be required.



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