

February 5, 2001

NKK Corporation  
Nippon Sanso Corporation  
Toyota Tsusho Corporation  
Hitachi, Ltd.  
Marubeni Corporation  
Idemitsu Kosan Co., Ltd.  
INPEX Corporation  
TotalFinaElf  
LNG Japan Corporation

### **Consortium Establishes DME Development Co.**

*Aiming at development of direct synthesis technology  
for low-cost mass production of DME, a new clean energy source*

TOKYO -- A consortium of nine companies jointly established a private research company called DME Development Co., Ltd. to pursue the development and commercialization of technology for the direct synthesis of dimethyl ether (DME). The partners are NKK Corporation, Nippon Sanso Corporation, Toyota Tsusho Corporation, Hitachi, Ltd., Marubeni Corporation, Idemitsu Kosan Co., Ltd., INPEX Corporation, TotalFinaElf and LNG Japan Corporation.

DME is expected to help meet the growing demand for stable energy supplies and reduced environmental load in the face of rising concerns about serious energy shortages and environmental problems.

DME is a clean energy source that can be produced from a wide variety of hydrocarbon materials. It has very little environmental load because it generates absolutely no sulfur oxide or particulate matter during combustion. DME is also non-toxic and extremely easy to handle, making it widely applicable in fields such as consumer fuel (as an alternative to LPG), transportation (in fuel cells and as an alternative to diesel fuel), electric power generation (in thermal power plants and fuel cells) and hydrogen-based power generation.

The process of directly synthesizing DME would enable untapped reserves of low-grade coal and the smaller gas fields around Asia to be put to effective use. Considering the ready availability of resources needed for its production, DME offers the promise of

becoming a widely available form of new energy offering the attractive combination of energy independence and low-level environmental load.

NKK, backed by Japan's Agency of Natural Resources and Energy under the Ministry of Economy, Trade and Industry (METI), has led an ongoing, collaborative effort to establish direct synthesis technology for the low-cost mass-production of DME. An NKK-led team, working with the Center for Coal Utilization of Japan between 1997 and 2000, succeeded in synthesizing DME from coal-bed methane using a 5-ton-per-day bench plant. In fiscal 2001, working under consignment from the New Energy and Industrial Technology Development Organization (NEDO), the team advanced to the conceptual design phase for a 100-ton-per-day pilot plant for larger-scale demonstration tests. The newly established company will focus on demonstration testing and the development of more efficient technology, aiming to commercialize DME direct synthesis technology as quickly as possible.

The latent market for DME as a replacement for LPG and generator fuel in Asia alone is estimated to grow to approximately 100 million tons a year by 2010, according to a survey NKK conducted in 2000. In view of DME's tremendous potential as a new source of alternative energy, NKK and the other members of the above-mentioned consortium (except LNG Japan, which joined later) established DME International Corporation in October 2001 to conduct marketing and related commercialization feasibility studies, which are now under way.

DME Development, operating as the sister company of DME International, will pursue the technical side of developing DME direct synthesis technology for commercial applications.

#### **Profile of DME Development Co., Ltd.**

Address:	1-1-2 Marunouchi, Chiyoda-ku, Tokyo (premises of NKK head office)	
Capital:	¥3.3 million	
Investment shares:	NKK Corporation	62.12%
	Nippon Sanso Corporation	10.61%
	Toyota Tsusho Corporation	6.06%
	Hitachi, Ltd.	6.06%
	Marubeni Corporation	3.03%
	Idemitsu Kosan Co., Ltd.	3.03%
	INPEX Corporation	3.03%
	TotalFinaElf	3.03%
	LNG Japan Corporation	3.03%

President: Yotaro Ohno, concurrently Senior General Manager,  
Environmental Solutions Center, NKK Corp.

Directors: Osamu Inokoshi, concurrently Chief Manager, DME Project  
Group, Environmental Solutions Center, NKK Corp.

Toshio Suwa, concurrently Director, Yamanashi Research  
Center, Technical Development Group, Nippon Sanso Corp.

# # #