

## **TBM intends to establish cooperation agreement to explore manufacturing of LIMEX in Saudi Arabia with JGC and NICDP** **TBM Signs Memorandum of Understanding with JGC and NICDP**

“LIMEX” is new material developed by TBM Co., Ltd. (“TBM”) which are mainly made of limestone and turned into paper and plastics without using water nor pulp. TBM, JGC Corporation (“JGC”) and National Industrial Clusters Development Program (“NICDP”) have reached a basic agreement on March 14, 2017 to explore the possibility of expanding LIMEX business into Saudi Arabia.

In accordance with this basic agreement, TBM will conduct a feasibility study of manufacturing LIMEX products in Saudi Arabia. And to begin with this agreement, TBM will strive to expand the LIMEX business globally.



### ■ Background

In February 2015, TBM set up its first LIMEX manufacturing plant with a grant from The Ministry of Economy, Trade and Industry of Japan, and started selling LIMEX products. Since then, TBM has been discussing strategies for the second manufacturing plant with JGC. At the same time, TBM has been working on global expansion of LIMEX business, with the launch of its first overseas office in Silicon Valley, U.S. in July 2016 and conducting an overseas market research.

NICDP is a program established with the approval of Saudi Arabian Ministerial, which aims to support partnership between industries in Saudi Arabia and their partners in global manufactures that can foster the growth of domestic industries and diversification.

TBM has been planning to export a LIMEX plant and technology globally (“LIMEX Export Scheme”). LIMEX Export Scheme is likely to make a great contribution to create employment opportunities apart from the conservation of water resources globally. NICDP has recognized that the LIMEX Export Scheme will create non-oil related employment opportunities in Saudi Arabia, that would fit the scheme of economic reform plan ‘Saudi Arabia Vision 2030’. TBM and NICDP, along with JGC who has extensive experience in building plants and developing business overseas, will conduct a feasibility study toward expansion of LIMEX business into Saudi Arabia.

## ■ Cooperation Outline

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The following three scope areas will be discussed between the three parties to clarify respective role and activities, with an aim of exploring the LIMEX business expansion into Saudi Arabia and examining the relevant regulations as well as location of new plants.

- To study and collect information related to LIMEX production, e.g., paper and plastic usage, Kingdom's domestic production and current import volume and other market information.
- To execute the feasibility study for LIMEX production in Saudi Arabia
- To identify local partners who can drive LIMEX material production

## ■ About a New Material 'LIMEX'

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### [About LIMEX]

- LIMEX made from limestone that can be used as paper and plastics is a revolutionary material that is both ecological and economical.
- In 2013, TBM was adopted Innovation center establishment assistance program (subsidy for advanced technology demonstration and evaluation facility development, and others) run by Ministry of Economy, Trade and Industry.
- In 2014, LIMEX acquired a patent in Japan. It has acquired patents in 6 countries worldwide and applied for patents in 43 countries including America and Europe.
- In February 2015, TBM completed a pilot plant in Shiroishi, Miyagi Prefecture, with an annual production capacity of 6,000 tons.
- In 2016, TBM became the first winner of Plug and Play in social impact sector, one of the three largest incubators in Silicon Valley.

### [As paper alternatives]

- While producing one ton of regular paper would normally require roughly 20 trees and 100 tons of water, LIMEX can be produced one ton of LIMEX paper with 0.6–0.8 tons of limestone and roughly 0.2-0.4 tons of polyolefin and without using wood or water.
- It is highly water-resistant, so it can be used in the bathroom, in wet areas, outdoors, and underwater and recycled almost indefinitely.

### [As plastic alternatives]

- While conventional plastics are made 100% from petroleum-derived resins, LIMEX is made primarily from limestone, permitting a major reduction in the quantity of petroleum-derived resins used.
- LIMEX is made mainly from limestone, which is inexpensive, meaning that the product can be provided at a low cost.
- LIMEX plastics can be produced from recycled LIMEX materials including printings, contributing to reduce the burden on the environment.

### [Reserves of limestone as a resource]

- Japan itself is 100% self-sufficient in limestone. There are abundant reserves of limestone available worldwide and it is considered virtually inexhaustible.

### [Life Cycle Assessment]

- TBM has conducted a life cycle assessment, collaborating with Oki Lab, IIS, The University of Tokyo since April 2016, and assessed water footprint and GHG emission through to raw materials and product manufacture in LIMEX paper and LIMEX plastics.
- The water footprint of LIMEX paper through to raw materials and product manufacture is approximately 98% reduction, compared to conventional coated printing paper.
- The GHG emission of LIMEX paper through to raw materials, product manufacture and disposal

(combustion) is approximately 5% reduction, compared to conventional coated printing paper.

- The GHG emission of LIMEX plastics through to raw materials and product manufacture is approximately 37% reduction, compared to conventional plastics.
- We will continue to engage in further reducing water footprint and GHG emission while choosing raw materials and reviewing the manufacturing process

#### ■ TBM Co., Ltd.

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CEO and President: Nobuyoshi Yamasaki

Head office: 2-7-17-6F, Ginza, Chuo-ku, Tokyo

Founded: 2011

Capital: 4,069.2 million yen (including capital reserve) / as of January 2016

Business description: Development, manufacture and sale of LIMEX and LIMEX products

URL: <http://www.tb-m.com>

#### ■ JGC Corporation

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President and Representative Director : Koichi Kawana

Yokohama World Operations Center: 2-3-1, Minato Mirai, Nishi-ku, Yokohama

Founded: 1928

Capital: 23,511.18 million yen / as of March 31, 2016

Business description

1. Consulting, planning, basic and detailed design, materials and equipment procurement, construction, commissioning, operation and maintenance services for various plant and facilities
2. Investment in oil and gas field development projects and utility business
3. Technology development services

URL : <http://www.jgc.com/jp/index.html>

#### ■ National Industrial Clusters Development Program (NICDP)

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President : Khalid Al-Salem

Office : P.O. Box 65295 Riyadh 11556, Kingdom of Saudi Arabia, CSC Building F6

Tel : +966-11-218-8957

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E-mail: [info@ic.gov.sa](mailto:info@ic.gov.sa)

Business description : The industrial Clusters program established as a government agency under the leadership of the Ministry of Energy, Industry and Mineral Resources of Saudi Arabia, aims to develop the five industrial clusters in Saudi Arabia, including automotive, minerals and metal processing, solar energy products, plastics and packaging, and pharma & biotech, by attracting overseas manufactures. NICDP was established as a government agency in 2007.

It provides facilitation support through other government agencies in a wide range of areas including industrial land allocation , industrial loans and aligning the needs of foreign investors with the policy of government agency in Saudi Arabia.

URL : <http://www.ic.gov.sa/>

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