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With Russia's re-entry into the global economy, a largely unexploited market has been opened up. Which sectors hold the most promise for Singapore companies?

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**CASE STUDY**

**Breaking the Arctic's ice**

*Keppel makes headway in Russia's growing offshore market*

Russia is the world's largest exporter of natural gas, the second largest oil exporter and the third largest energy consumer.

The Keppel Offshore & Marine (Keppel O&M) Group's relationship with Russia dates back to the '80s when Keppel Shipyard serviced various owners in ship repair and ship conversion, and Keppel FELS, offshore rig construction and repair.



Keppel continued to fortify ties with Russia having secured a series of contracts from LUKOIL in recent years to build highly-advanced ice-capable vessels.

In recent years, The Group's specialised shipbuilding arm, Keppel Singmarine, continued to fortify ties with Russia. It has secured a series of seven projects from Russian national oil company, LUKOIL, to build highly-advanced ice-capable vessels such as Anchor Handling Tug Supply vessels, rescue vessels, icebreakers and a Floating, Storage and Offloading facility.

Keppel Singmarine's partnership with LUKOIL is a significant step in the Group's efforts to enhance its services for the Russian offshore market.

**Building a niche**

According to the latest United States Geological Survey, it is estimated that the Arctic may hold as much as 90 billion barrels of undiscovered oil reserves and 1,670 trillion cubic feet of natural gas. This is equivalent to as much as 13 percent and 30 percent of the world's total undiscovered oil and natural gas respectively.

Russia's huge oil and gas reserves, trapped in the bowels of this icy abyss, have fuelled demand for specialised icebreaking support vessels, which are traditionally built in European yards.

In 2006 Keppel Singmarine won contracts from Russian customer, LUKOIL, to build two such vessels at the former's yard in Singapore. Delivered in 2008, Varandey and Toboy made history as the first two icebreakers constructed in Asia for one of the harshest marine frontiers on Earth.

"This was the first time that icebreakers meant for the Arctic region were built in the tropics. It also marked Keppel Singmarine's entry into the flourishing oil and gas market in the Arctic region," Charles Foo, Chairman of Keppel Singmarine, said.

Operating in the Barents Sea of Russia, the vessels' main task is to pave the way for ships to sail through ice-blocked seas. They also carry out fire fighting, rescue and emergency operations, as well as provide supplies and towing functions. Both Varandey and Toboy are designed to cut through solid ice over 1.7m thick, equivalent to the height of a grown man, and operate in extreme temperatures as low as -45°C.

**Overcoming challenges**

Never before have vessels for the frozen North been constructed in the tropics. The design and construction of the icebreakers has met with many challenges. Prior to commencement of ship construction, extensive ice model testing was carried out to confirm the hull-ice interaction, ship speed in level ice and other key features of the icebreaker.

Infused with Keppel's hallmark "Can-Do" spirit, and armed with a strong track record of some 400 specialised shipbuilding projects, Keppel Singmarine conquered these obstacles with great success.

With the completion and delivery of the two icebreakers, Keppel Singmarine has made headway into the 'impenetrable' Arctic market. This experience has further strengthened Keppel Singmarine's partnership with LUKOIL.

### Paving the future

Over the last few years, the Keppel O&M Group has been investigating the unique challenges to offshore structures in Arctic regions, particularly the extreme cold temperatures and ice loads.

"The increasing oil and gas exploration and production activities in the Arctic present tremendous opportunities for specialised and robust vessels such as the icebreakers," Foo, who also heads the Keppel O&M's R&D centre, KOMtech, said.

"Seizing this opportunity and in line with Keppel O&M's 'Near Market, Near Customer' strategy, we have embarked on a study of the offshore activities in the Arctic in order to build up our shipbuilding capabilities in ice technology," he added.

The results have been encouraging. The areas of research have expanded to include the experimentation of new materials and equipment, and the prototype design of mobile ice-resistant offshore drilling units, ice-capable jackups and various specialised vessels.

Leveraging its knowledge of ice technology, Keppel's Marine Technology Development unit has succeeded in designing the world's first Ice-Class Floating Storage and Offloading (FSO) facility for LUKOIL. The hull was built by Keppel Singmarine in Singapore and the vessel is currently being assembled in Azerbaijan by sister yard, Caspian Shipyard Company.

With a good understanding of the Russian offshore sector and its unique operating conditions, Keppel is poised to meet the needs of this emerging market.

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