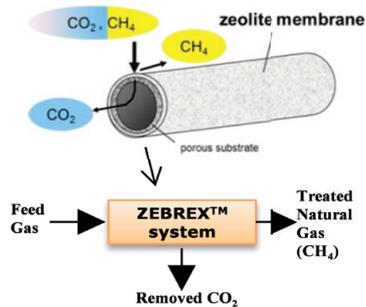


## Examples of JOGMEC's Technical Solutions

### Environmental

#### Zeolite Membrane for CO<sub>2</sub> Removal



This technology separates CO<sub>2</sub> from natural gas in a cost effective and systematic manner. Its small footprint allows for integration at production sites, to treat natural gas by removing CO<sub>2</sub>, which then becomes a marketable by-product for utilization elsewhere.

#### Ceramic Membrane-Based Produced Water Technology

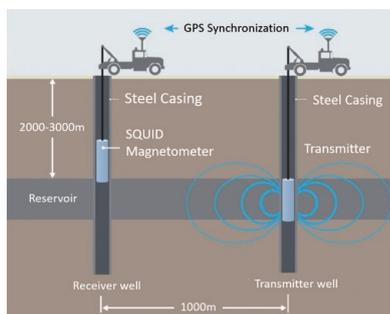
Diameter: 180mm  
Length: 1,500mm  
Filtration Area: 25m<sup>2</sup> (472 bbl/d)



This technology uses ceramic membranes to treat produced water, by removing oil and suspended solids. Ceramic membranes have higher resistance to chemical and oil fouling and have a larger filtration contact area, which leads to less elements and/or units being required to deliver equivalent treatment capacities.

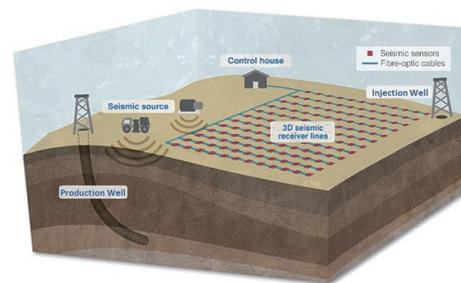
### Reservoir Monitoring

#### Cross-well EM monitoring tool with super sensitive SQUID magnetometer



SQUID is a supersensitive and broadband magnetometer. It provides improved accuracy in the cross-well EM (Electro Magnetic) monitoring of fluid distribution within the reservoir even if the well separation exceeds a thousand meter.

#### Optical Interferometric Sensors with Fiber-Optic Communication for Permanent Seismic Monitoring



This technology applies optical interferometric sensor system to 3D seismic monitoring. It detects changes in the rock properties of reservoir at the process such as CO<sub>2</sub>-EOR. The system is maintenance-free operation without electric power supply at the sensor site with high dynamic range.

### Heavy Oil Development

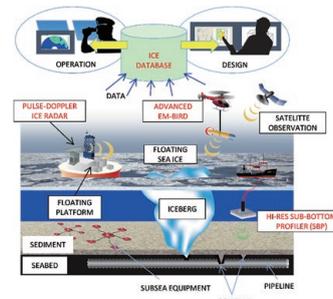
#### SCWC (Supercritical Water Cracking) for Extra Heavy Oil Upgrading



SCWC is a technology for upgrading high viscosity, extra heavy oils (e.g. oilsands) into synthetic crude for pipeline transportation. This process does not emit any waste, making it an environment-friendly technology.

### Offshore/Frontier Development

#### Ice Observation Technologies and Ice Database for Oil & Gas Development in Arctic Regions



These technologies consist of Pulse-Doppler Rader, Advanced EM (Electro Magnetic)-Bird, Sub-bottom profiler and Ice Data Base. These technologies can provide accurate observation data of sea ice and help operation and design of floating platform.