

# 2018 Market Forecast: Well Services Demand and Opportunities in the Asia Pacific

Sam Scarpa, Offshore Network

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## INTRODUCTION

With the well intervention market expected to grow globally from an estimated USD 8.18 billion in 2017 to USD 9.85 billion by 2022, the Asia Pacific is one of the region set to most benefit from this wave of activity as it combines all 3 factors driving the upsurge: a rise in energy demand, an increase in oil & gas production and a need to revitalize aging fields. The Asia Pacific region is in fact likely to account for “about \$25 billion of spending in 2018-2022,”<sup>1</sup> most of which will come from Australia, Malaysia and Indonesia, with some also in Thailand.

Furthermore, a recent Wood Mackenzie estimate outlines that offshore operators in the Asia-Pacific could face a total decommissioning bill of over \$100 billion with nearly 2,600 platforms and 35,000 wells needing to be abandoned in the near future.<sup>2</sup> The opportunity for service providers is therefore as vibrant on the production uplift side as it is in the abandonment sphere.

The below Asia Pacific market analysis aims to highlight opportunities for regional and international contractors through a country-by-country study, a discussion of regional market dynamics and an overview of required well service.

## MALAYSIA

Government Representation: *Petroleum Nasional Berhad (Petronas)*

Most of Malaysia’s oil reserves are located in three main offshore fields with more than half of oil production coming from the Tapis Oil Field in the offshore Malay basin. The government’s main focus has long been on offsetting production declines from mature assets such as larger shallow water fields in the offshore Peninsular Malaysia by opening up new investment opportunities through enhancing output from existing wells and developing new fields in deep water areas offshore Sarawak and Sabah.

However Malaysia’s newer reserves are mostly found off the coast of Northern Borneo in water depths between 200 to 1200 meters, making exploration and production more costly. Starting in 2015, Malaysia witnessed marginal growth in oil production and reserves, while gas production continues to decline prompting government efforts to encourage investment in Enhanced Oil Recovery (EOR).<sup>3</sup> This could have been prompted by the successful results of ExxonMobil Exploration and Production Malaysia Inc.’s 2014 EOR project. Described as Malaysia’s first large-scale enhanced oil recovery project, the operation involved water-alternating-gas injection from the Tapis R central processing platform into targeted wells on the existing Tapis A platform. The EOR project utilized the immiscible water-alternating-gas process to recover remaining oil reserves from the field by gradually sweeping remaining oil to the producing wells, increasing the overall recovery of the field.<sup>4</sup>

A pro-active regulatory environment and declining production in aging fields therefore offer huge opportunities for well service contractors capable of offering uplift services to Malaysian operators.



Figure 1 - Source: 2B1st Consulting

1 <http://www.oedigital.com/component/k2/item/16447-decom-dollars>  
 2 <https://www.bloomberg.com/news/articles/2018-02-01/-100-billion-clean-up-bill-awaits-asia-s-old-offshore-oil-wells>  
 3 <https://www.export.gov/article?id=Malaysia-Oil-and-Gas-Equipment>  
 4 [https://www.rigzone.com/news/oil\\_gas/a/134996/exxonmobil\\_starts\\_up\\_25b\\_tapis\\_eor\\_project\\_offshore\\_malaysia/](https://www.rigzone.com/news/oil_gas/a/134996/exxonmobil_starts_up_25b_tapis_eor_project_offshore_malaysia/)

## INDONESIA

*Government Representation: SKK Migas*

With proven oil reserves of 3.7 billion barrels, Indonesia ranks in the top 20 of the world's oil producers.<sup>5</sup> However, according to Johan Utama, Southeast Asia Oil Analyst at Wood Mackenzie, only 4 offshore rigs appeared to be active in Indonesia in the first half of 2017 compared to as many as 19 in 2013-14.<sup>6</sup> Declining activity and production can be explained by:

- **Maturing oil and gas fields:** According to a BCG report, more than 60% of oil production and more than 30% of gas production come from late-life-cycle resources.<sup>7</sup> The same report suggests six actions required to revive Indonesia's upstream exploration and production and interestingly, the first is to enhance production capabilities from existing fields. This could include advanced recovery technologies, such as enhanced oil recovery (EOR), as well as well interventions and workovers on mature fields to slow or even reverse production declines.
- **A complex and changing regulatory system** that has led to the exit of several majors such as ExxonMobil who withdrew from the East Natuna field in 2017. Discovered by Agip in 1973, the field, which averages at about 145m water depth, is one of the world's largest untapped gas fields – one that Pertamina, the Indonesian state company, will now be left to develop.
- **Lack of local expertise and technology:** the BCG report also describes how "EOR requires major capital investment as well as advanced technologies and expertise that aren't available locally."<sup>8</sup>

A perfect storm is therefore unfolding: with several international majors exiting the country and taking with them a skilled workforce and expertise, aging fields will continue to require wellwork. Indonesia therefore offers huge opportunities to international service providers to fill this technology gap and develop business, not only for production enhancement but also in terms of well integrity and diagnostics as "comprehensive screenings of existing and idle fields is necessary to map the prospects for EOR activities and to identify fields with the highest potential yields."<sup>9</sup>

## BRUNEI

*Government Representation: Petroleum Brunei & Petroleum Unit of the Prime Minister's Office is the regulatory body for the oil and gas industry*

The oil & gas sector is essential to Brunei Darussalam's economy as it accounts for more than 60 per cent of its GDP. It is interesting to note that all of Brunei's gas and 90 per cent of its oil comes from offshore fields. Brunei Shell Petroleum (BSP) is the largest oil producer in the country and contributes around 90 per cent of Brunei's oil and gas revenues.

Alongside new exploration and developments, a major area of focus for the government has been the maximisation of the potential of mature oil and gas fields. Local content regulations are also very strong to ensure "locals are highly educated and technically skilled to meet industry needs."<sup>10</sup> As per the below excerpt from the Brunei Darussalam Energy White Paper 2014, enhanced recovery, the maximization of production and data acquisition all form part of the country's main priorities and offer opportunities for contractors to provide new technology and services.

### Priority Initiative 1: Rejuvenate Existing Fields

A core focus area in upstream will be the rejuvenation of our current producing assets to enhance recovery from these fields and maximise production. 'Ever-greening' of our macro-assets will at first require conducting a full field review and acquiring new, deeper data as well as conducting additional geological research to identify the potential actions to be taken. Global best practices demonstrate that the deployment of new technology, coupled with the right incentives for mature field (re)development can create the conditions to increase the recovery (percentage of the oil recovered over the total amount of oil originally in place in the field) from a global average of less than 30 percent to 40 percent or more.

The EDPMO currently encourages operators to deploy state-of-the-art subsurface IOR and EOR technologies in Brunei Darussalam, to maximise the recovery from existing fields. The EDPMO will review regulatory measures that could help boost the use of these modern technologies. Such techniques could potentially increase production by 10 to 20 percent, which would mean increasing recovery to about 45 percent in those fields.

Figure 2: Brunei Darussalam Energy White Paper 2014, p.19

5 <https://www.pwc.com/id/en/energy-utilities-mining/assets/oil-and-gas/oil-and-gas-guide-2017.pdf>

6 <https://www.bloomberg.com/news/articles/2017-08-14/whatever-happened-to-indonesia-s-mighty-oil-and-gas-industry>

7 <https://www.bcg.com/en-gb/publications/2017/upstream-oil-gas-energy-environment-indonesia-billion.aspx>

8 <https://www.bcg.com/en-gb/publications/2017/upstream-oil-gas-energy-environment-indonesia-billion.aspx>

9 <https://www.bcg.com/en-gb/publications/2017/upstream-oil-gas-energy-environment-indonesia-billion.aspx>

10 Energy White Paper, Brunei Darussalam, 2014

Another key area for the oil & gas industry in Brunei going forward will be decommissioning activities. Indeed, for several years now, the government has been working with BSP to develop guidelines for the decommissioning, abandonment and restoration of oil and gas industry assets – a phased approach to abandonment is now in place starting with the plugging and abandonment of hundreds of wells.

## **THAILAND**

*Government Representation: PTT Exploration and Production (PTTEP)*

Thailand's offshore production is found in shallow water depths of about 30-80 metres and the country has a well developed oil and gas sector that can be traced back to the extensive exploration of the 70s and international commercial discoveries of the 80s. Having already conducted 20 concession bidding rounds, Thailand has one of the most advanced petroleum regimes, relative to other countries in the region.

A recent Australian report assesses that "decommissioning of low performing and nonviable platforms is an emerging area of opportunity for exporters, of which there is little local capacity in Thailand to deliver. For example, Chevron who is the largest upstream operator in Thailand, is expected to commence decommissioning platforms early 2017."<sup>11</sup> It is expected that Chevron's proactive approach to large scale decommissioning in the Gulf of Thailand will set a new benchmark for the region.<sup>12</sup>

## **VIETNAM**

*Government Representation: Petrovietnam (PVN)*

Oil and gas production plays a key part in Vietnam's economic growth and energy security and the country is ranked 25th in terms of proven oil and gas reserves.<sup>13</sup> While the government has tried to develop E&P activities in Vietnam's new deep-water blocks, most of the country's exploited reserves are located offshore in the Cuu Long and Nam Con Son basins, in the south of Vietnam. The Rang Dong oil field for example is located 135km south-east of Vung Tau in block 15-2 and has been producing for nearly 20 years. In February 2011, operator Japan Vietnam Petroleum Corporation (JVPC) and its partners announced a pilot test for enhanced oil recovery (EOR) from the field. Production was successfully increased by injecting CO2 into the reservoir in what was claimed to be the first offshore EOR in south-east Asia.<sup>14</sup>

Vietnam's oilfields are maturing and crude oil production capability is forecast to decline significantly from 2019. Some assets such as the White Tiger field have been producing for over 30 years and have been declining since 2005<sup>15</sup>. While operator PetroVietnam (PVN) has explored and exploited fourteen small marginal fields from 2006 to 2010, these new fields failed to offset the declining output from White Tiger. Similarly to Indonesia, opportunities are therefore plentiful for providers of late life well intervention services.

## **AUSTRALIA**

*Government Representation: NOPSEMA*

The offshore oil and gas E&P sector plays a critical role in Australia's energy needs. However, despite most of the energy supply originating offshore with more than 80% of Australia's gas resources existing in deep, remote, offshore reservoirs, the deepwater sector remains relatively unexplored. In fact, only 12 per cent of Australia's marine territories are properly mapped.<sup>16</sup> As such, current research is exploring ways of maximizing recovery from already producing reservoirs but one of the biggest challenges remains finding ways to access gas reserves in very deep water, also known as stranded gas.

Furthermore, "in 2014–15 Australia's crude oil and condensate production declined by 5 per cent to average 19 giga litres, reflecting a long term downward trend in declining production from mature liquid petroleum fields."<sup>17</sup> The development of innovative production enhancement and deepwater well access technology is therefore key.

<sup>11</sup> <https://www.austrade.gov.au/Australian/Export/Export-markets/Countries/Thailand/Industries>

<sup>12</sup> <http://www.offshore-mag.com/articles/2018/02/asia-pacific-needs-to-address-decommissioning-costs-analyst-warns.html>

<sup>13</sup> BP Statistical Review of World Energy, 2017

<sup>14</sup> <https://www.offshore-technology.com/projects/rang-dong>

<sup>15</sup> BMI Research, Vietnam Oil and Gas Report Q4 2017

<sup>16</sup> <https://www.csiro.au/en/Research/EF/Areas/Oil-gas-and-fuels/Offshore-oil-and-gas>

<sup>17</sup> Experience, Innovation and Proven Solutions, 2016, Australian Oil & Gas, [www.austrade.gov.au](http://www.austrade.gov.au)

Maturing fields and declining production rates are also opening up a major opportunity for oil & gas service companies wishing to enter the Australian abandonment market, with the cost of decommissioning Australia's oil and gas infrastructure currently estimated at more than US\$21 billion over the next 50 years. The recent publishing of the Petroleum Decommissioning Guideline in November 2017 aimed at clarifying how the government of Western Australia will approach the decommissioning of onshore and offshore registered petroleum assets is expected to kickstart a wave of projects as fields approach the end of their life.<sup>18</sup>

Deloitte in fact describes how the "upcoming decommissioning wave represents a perfect 'greenfield' opportunity for Australia's oil and gas industry to apply innovative thinking, new technologies, new workforce skills and collaborative approaches."<sup>19</sup> Interestingly though, the National Energy Resources Australia Growth Centre's 2016 Oil and Gas Competitiveness Assessment only ranked Australia at the bottom of 30 oil and gas producing nations for abandonment and decommissioning.<sup>20</sup> According to Wood Mackenzie, this could be due to the fact that the Australian supply chain lacks some of the required vessels, tooling, disposal facilities and the trained workforce for offshore decommissioning. The opportunity for international and regional service providers is therefore clear.

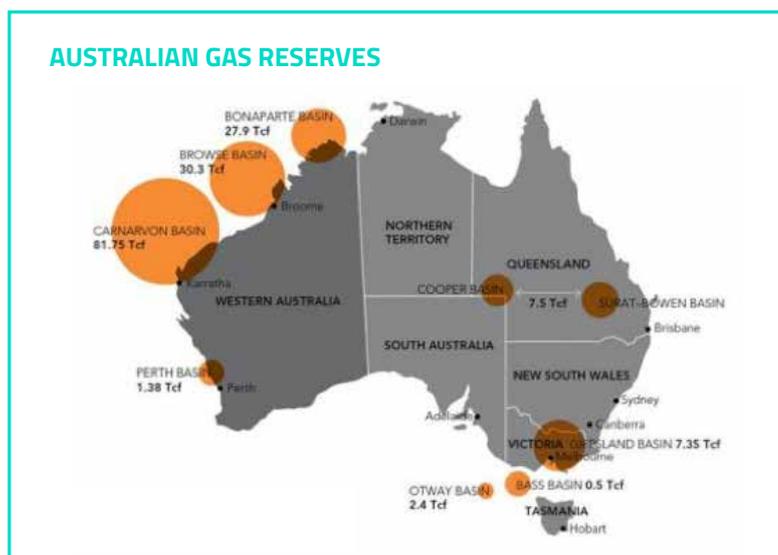


Figure 3 - Source: [www.earthsci.org](http://www.earthsci.org)

## INDIA

*Government Representation: Oil and Natural Gas Corporation Limited (ONGC)*

As of 2016, India had estimated proved crude oil reserves of 4.7 thousand million barrels and natural gas proved reserves of 43.3 trillion cubic feet<sup>21</sup> with the largest reserves found in the Western Offshore and Assam areas.

ONGC's prime oil producing field, Mumbai High, located offshore in the Arabian Sea, approximately 160km west of the Mumbai coast, along with other small fields along the Western Offshore, produce about 44 per cent of India's total crude oil production.<sup>22</sup> With production having begun in 1976, several parts of the Mumbai High field have seen major production decline, therefore offering opportunities for both late life production enhancement uplift operations and decommissioning activity. The Mumbai High North has also been undergoing a phased redevelopment plan over the past few years involving the drilling and commissioning of dozens of new wells as well as the side tracking of poor producers, with the ultimate goal of enhancing oil recovery rates.<sup>23</sup>

Interestingly, the well intervention market is also buoyant onshore. The Barmer basin in Rajasthan for example includes over 600 wells operated by Cairn India Limited. Cairn maintains an average of 30 well intervention units (rig-based and rigless) to perform over 5000 interventions per year.<sup>24</sup> The company also recently announced large scale investment would be aimed at ramping up crude production at the Barmer basin with for instance the introduction of an Enhanced Oil Recovery (EOR) program at the Mangala-Bhagyam-Aishwarya (MBA) fields.<sup>25</sup> Well service companies keen to enter or consolidate their market share in India should therefore look out for onshore opportunities as well as offshore.

<sup>18</sup> <https://www.herbertysmithfreehills.com/latest-thinking/new-western-australian-guideline-on-decommissioning>

<sup>19</sup> <https://www2.deloitte.com/au/en/pages/media-releases/articles/australias-next-oil-and-gas-boom-160517.html>

<sup>20</sup> [https://www.nera.org.au/Article?Action=View&Article\\_id=56](https://www.nera.org.au/Article?Action=View&Article_id=56)

<sup>21</sup> BP Statistical Review of World Energy, 2017

<sup>22</sup> <https://timesofindia.indiatimes.com/business/india-business/ongc-makes-significant-oil-gas-discovery-in-arabian-sea/articleshow/62325917.cms>

<sup>23</sup> <https://www.offshore-technology.com/projects/mumbai-high>

<sup>24</sup> <https://search.spe.org/i2kweb/SPE/doc/onepetro:5A1B8EAC>

<sup>25</sup> <https://economictimes.indiatimes.com/industry/energy/oil-gas/cairn-india-to-invest-rs-37000-crore-to-ramp-up-production/articleshow/62498925.cms>

## CONCLUSION

Well intervention in the Asia Pacific is currently preparing for a wave of activity supported both by the more mature shallow water basins and the emerging need for subsea well work projects. The multitude of companies operating across various countries, combined with a lack of regional service providers in some areas, therefore offers contractors a chance to secure one of a kind projects from operators keen to make the most out their wells but also those looking to retire end of life and non-commercial assets. Cross-country collaboration and the sharing of expertise could prove key in developing a thriving and dynamic well intervention community in the Asia Pacific. To conclude, the below grid outlines some of the applications that will experience a demand increase in 2018/2019:

UPLIFT WELL INTERVENTION	P&A & DECOMMISSIONING
Water Shut-Off	Wireline
Gas Shut-Off	Thru-Tubing
Gas Lift	Workover
Mechanical Integrity Repairs	Milling
Scale Remediation	Pulling of Downhole Equipment
Stimulation	Wellbore Cleanout
Conductor Repairs	Plug Setting
Annular Integrity Remediation	Cementing/Cement Squeeze
Well Evaluation	Downhole Diagnostics/Evaluation
Shut-In Reinstatement	Slot Recovery
Side-Tracks	Critical Integrity Remediation
ESP Change Out	Plug and Lubricate
Hydraulic Workover	Plug and Abandonment
Riserless Light Well Intervention	Riserless Light Well Intervention
Pumping Acid/Foam	
Hydraulic Fracture	
Re-Perforation	
Fishing Tools	
Downhole Diagnostics/Evaluation	

*\* This list is exemplary, and by no means exhaustive*

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