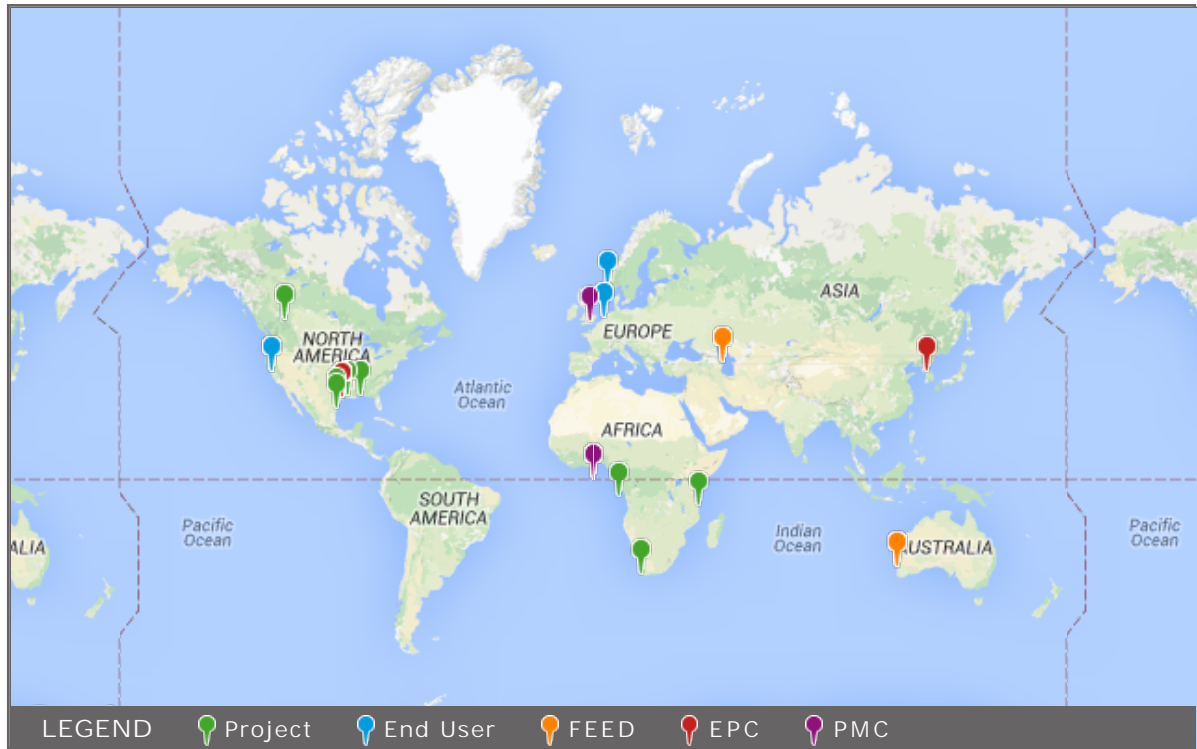




Report Name: KBR Market Analysts Report June 14th 2015 ; Project Status : Active ; Company : KBR ; Type of plant : FPSO,LNG Train,Ethylene Cracker (PolyEthylene HDPE LDPE LLDPE Ethanol EO EG EA PVC),Methanol,Clean Fuels - DHDS -DeHydroDeSulfurization





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Document reference |

## PERSONAL DETAILS

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Project Status : Active ; Company : KBR ; Type of plant : FPSO,LNG Train,Ethylene Cracker (PolyEthylene HDPE LDPE LLDPE Ethanol EO EG EA PVC),Methanol,Clean Fuels - DHDS -DeHydroDeSulfurization

MARKET DATA	
Number of projects	11
Number of countries per project site location	6
Number of countries per engineering companies location	5
Number of FEED : <i>(Front End Engineering &amp; Design)</i>	11
Number of PMC : <i>(Projet Manager Consultant)</i>	5
Number of EPC : <i>(Engineering, Procurement &amp; Construction)</i>	2



Document reference |

Generic name	End User Name	Country of project site location	Capital expenditure MUSD	FEED Year	EPC Year	Expected year of completion	Probability of on-time completion	Page
Chevron Angola Lucapa FPSO	Chevron	Angola	5 000	2013	2016	2019	●	4
Chevron Kitimat LNG	Chevron	Canada	5 000	2013	2015	2018	●	6
Chevron Kitimat LNG II	Chevron	Canada	5 000	2013	2016	2019	●	8
Gulf Coast LNG	Gulf Coast LNG Export LLC	USA	7 000	2014	2016	2019	●	10
Kinder Morgan Gulf LNG Export Terminal	Kinder Morgan Inc.	USA	6 000	2014	2016	2019	●	12
LNG Magnolia LNG Lake Charles	LNG Ltd	USA	4 000	2015	2016	2019	●	14
LyondellBasell Channelview Ethylene Second Expansion	Lyondellbasell	USA	200	2014	2015	2017	●	17
LyondellBasell Corpus Christi Ethylene Expansion	Lyondellbasell	USA	430	2014	2015	2016	●	19
Socar Baku Oil & Gas Processing and Petrochemical Complex (OGPC) Petrochemical	State Oil Company of Azerbaijan Republic (SOCAR)	Azerbaijan	6 000	2015	2017	2022	●	21
Statoil Tanzania LNG	Statoil	Tanzania	10 000	2015	2018	2022	●	24
Sunbird Ibhubesi Gas Project (IGP) FPSO	Sunbird Energy	South Africa	1 400	2014	2015	2018	●	27



Document reference |

CHEVRON ANGOLA LUCAPA FPSO





Document reference |

## CHEVRON ANGOLA LUCAPA FPSO

Last up date		Date	30/12/2014		
Last up date year		2014			
Status		Active			
Project Names		Chevron Angola Lucapa FPSO			
Project Site Country		Angola			
End User	Project End user Name	Chevron			
	End Users & Stakeholders	Sonangol			
	End Users Countries	Angola			
	Key Stakeholders	Financial Minority			
Expected year of Completion		2019			
"Feed Engineering Company (Front End Engineering & Design)	Bidders				
	Awarded	KBR			
	FEED Companies Country	USA			
	FEED Stage year	2013			
"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name				
	PMC or EPCM Country				
	Year of appointment				
"EPC Company (Engineering, Procurement & Construction)"	Bidders				
	Awarded				
	EPC Company Country				
	EPC Stage year	2016			
Main Standards		ANSI/NEMA			
Sourcing Strategy		Global			

Project  
Market  
Data

### General Information about the project

On first quarter 2012, the international oil company Chevron through its local subsidiary Cabinda Gulf Oil Company (Cabinda) and its partners, the national oil company Sonangol, Eni from Italy, Total from France, and Galp from Portugal, had awarded the front end engineering and design (FEED) contract to the Houston-based engineering company KBR for a new-build floating, production, storage and offloading (FPSO) vessel for the Lucapa project, offshore Angola. Located in the Block 14, the Lucapa oil and gas field was discovered in 2006 in water depth ranging between 800 meters and 2,000 meters with 3,340 total depth.

The Block 14 where lies the Lucapa field belongs to the Lower Congo Basin, so called because of the crossing Congo River Canyon.

In the Block 14, Chevron and its partners share the working interests in such a way:

- Chevron 31% is the operator
- Local Sonangol 20%
- Eni 20%
- Total 20%
- Galp 9%

In 2008, the discovery of satellite fields around the main reservoir confirmed the potential of Lucapa oil and gas field but in the same time its complexity to optimize the assets.

Consequently, Chevron and its partners ordered multiple conceptual studies to their respective preferred engineering services companies, Alliance Engineering, Doris Engineering and Houston Offshore Engineering.

From these conceptual studies, the recommendations to develop Lucapa converged in favor of a combination of subsea production wells and injection wells.

SBM Offshore to propose converted FPSO for Lucapa

To support this subsea production system, Chevron and its partners, Sonangol, Eni, Total and Galp opted for the FPSO with an estimated cost of \$5 billion capital expenditure.

On first quarter 2012, they awarded the FEED contract for the FPSO to KBR.

At that time, this FEED contract for the FPSO is based on a new-build unit.

In November 2012, Chevron and its partners selected WorleyParsons a™ subsea experts IntecSea to carry out the FEED work for the subsea, umbilical, risers and flowlines (SURF) system of the Lucapa project.

The FEED on the SURF package is based on a combination of 20 wellheads.

The FPSO is designed to produce:

- 100,000 b/d of crude oil
- 90 million cubic feet per day

In addition the FPSO should have a storage capacity of 1 million barrel of oil equivalent (boe) of hydrocarbon liquids.

The FEED on the FPSO is due by KBR to be completed by mid 2013.

In the meantime, they assess the capabilities and available capacities of the shipyard to execute the construction of this new-build FPSO.

The South Korean contractors, Daewoo Shipbuilding & Marine Engineering (DSME), Hyundai Heavy Industries (HHI), and Samsung Heavy Industries (Samsung) came first on the list.

Then Chevron and its partners established a second list of shipyards with the Chinese contractors and other companies such as STX.

In parallel, the Dutch SBM Offshore (SBM) proposed a solution for the FPSO based on a converted super tanker.

In respect with the time frame of the project, SBM should be able to submit its proposal for a converted FPSO to Chevron and its partners in the same time as KBR for the new-build version.

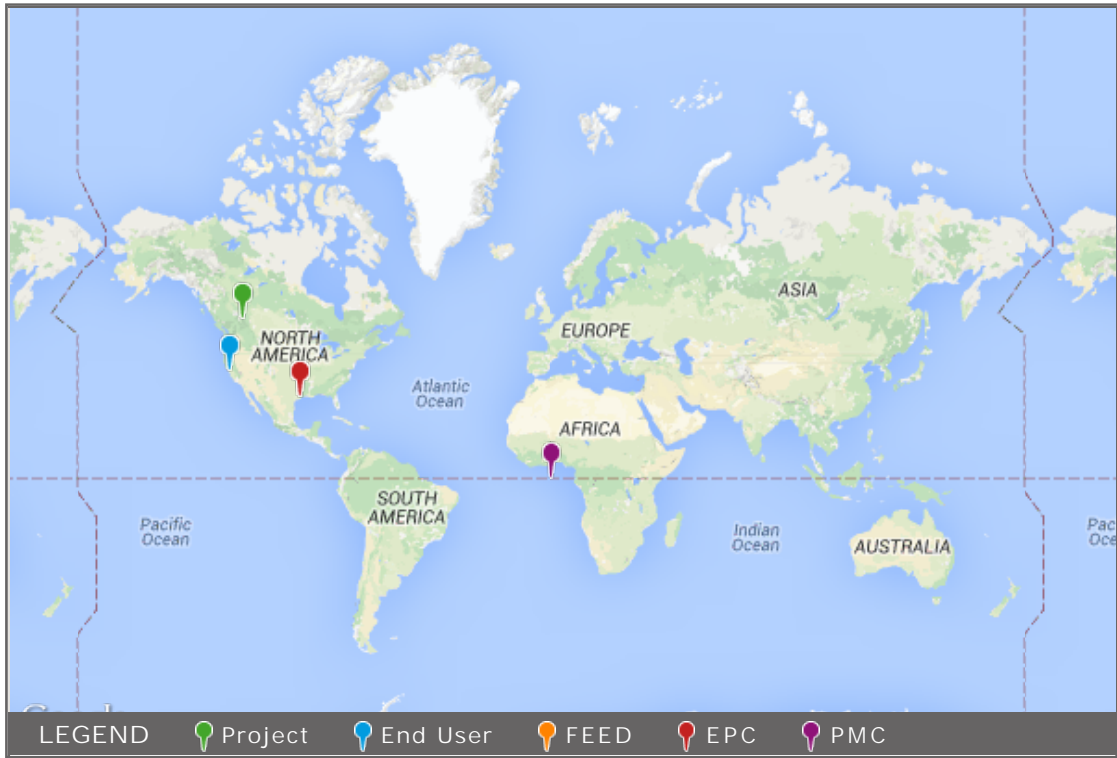
Therefore Chevron and its partners should be able to organize the call for tender with the pre-qualified shipyards in respect with both alternatives.

With both FEED works on the Lucapa FPSO being returned on the second half of 2013, Chevron and its partners Sonangol, Eni, Total and Galp are planning to make the final investment decision (FID) one year later in the second half of 2014.



Document reference |

CHEVRON KITIMAT LNG





Document reference |

## CHEVRON KITIMAT LNG

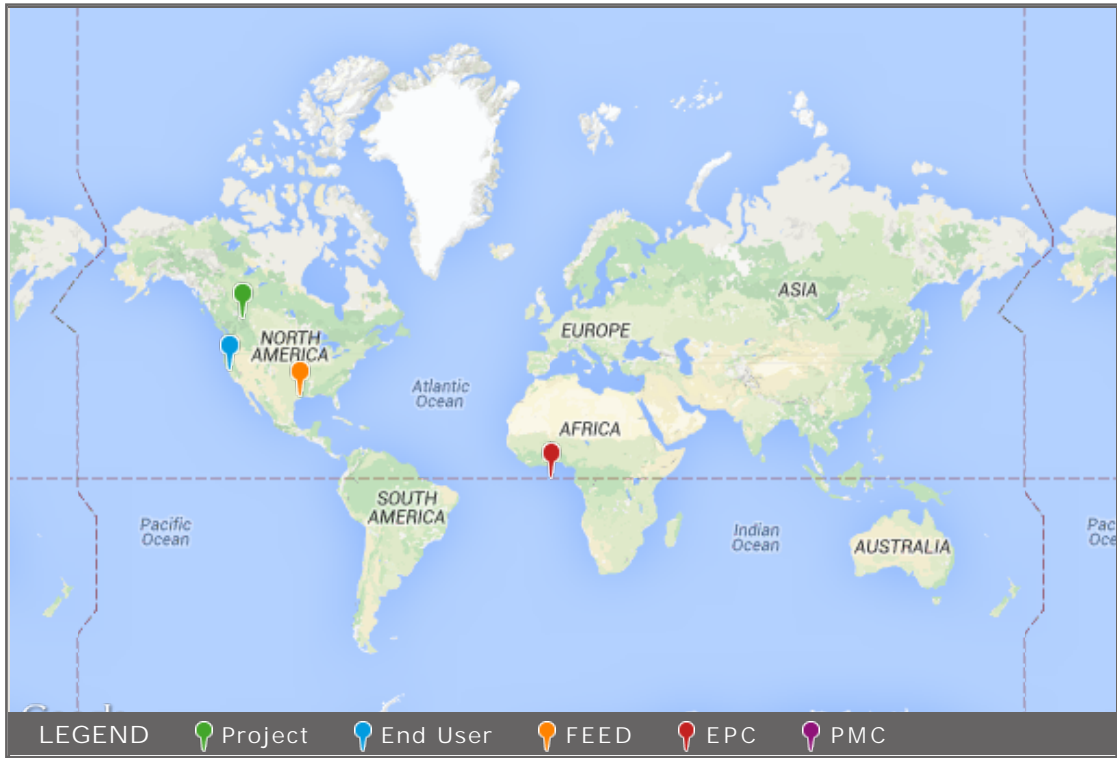
Last up date		Date	29/12/2014		
Last up date year		2014			
Status		Active			
Project Names		Chevron Kitimat LNG	Apache LNG	KMLNG	
Project Site Country		Canada			
End User	Project End user Name	Chevron			
	End Users & Stakeholders	Chevron	Woodside Petroleum		
	End Users Countries	USA	Australia		
	Key Stakeholders	Operational Leader	Financial Minority		
	Expected year of Completion	2018			
"Feed Engineering Company (Front End Engineering & Design)	Bidders				
	Awarded	KBR			
	FEED Companies Country	USA			
	FEED Stage year	2013			
"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name				
	PMC or EPCM Country				
	Year of appointment	0			
"EPC Company (Engineering, Procurement & Construction)"	Bidders				
	Awarded	Fluor - JGC			
	EPC Company Country	USA			
	EPC Stage year	2015			
Main Standards		ANSI/NEMA			
Sourcing Strategy		Global			
General Information about the project					
<p>Liard Basin tops best shale gas fields in North America</p> <p>The Houston, Texas-based, Apache Corporation (Apache) announced the shale gas Liard Basin in British Columbia (BC), Canada, to contain 48 trillion cf of marketable natural gas.</p> <p>Apache estimates that the Liard Basin field may contain up to 210 trillion cf (tcf) of natural gas out of which 48 tcf may be extracted and monetized. By way of comparison, all companies active in the Horn River Basin, have a total of marketable natural gas of 78 trillion cubic feet.</p> <p>With 48 tcf, Apache would then own more than two-thirds the size of the entire Horn Basin.</p> <p>The other two wells drilled since the first tests produced at the same level in quantity and quality as the first one.</p> <p>Actually the natural gas from the Liard wells is already being sold by Apache through a pipeline connecting them to Fort Nelson.</p> <p>Apache to convince Encana and EOR to double Kitimat LNG</p> <p>A fourth well is on going considering that each well in the shale gas Liard Basin costs \$35 million capital expenditure until completion for natural gas production. Despite this high cost, Apache made the calculation of a break-even price for the natural gas at the wellhead around \$2.57 per thousand cf.</p> <p>Thus the Liard Basin should be competitive compared with actual market conditions where natural gas is traded at \$1.78 per thousand cf at the Alberta hub, below the U.S prices at \$2.60 a thousand cf.</p> <p>The find by Apache Corp., one of three partners with Encana and EOG Resources in the \$4.5 billion Kitimat LNG terminal and pipeline proposal, is estimated to contain enough natural gas in itself to justify doubling the size of the Kitimat LNG terminal.</p> <p>Apache and its partners plan a five-million-tonne-a-year LNG plant and export terminal in Kitimat which, if supply and demand warrant it, could be doubled to 10 million tonnes a year.</p> <p>The Liard Basin alone could provide that additional five million tonnes of LNG for many years.</p> <p>Considering that the LNG is contracted in Asia around \$16 per thousand cf, Apache should not have too much difficulties to convince his partners, Encana and EOG Resources, to double capital expenditure in Kitimat LNG after the shale gas Liard Basin discovery.</p> <p>January 2013 Chevron takes over EOR and Encana interests in Kitimat LNG and Apache buys 10% stakes to Chevron so that Chevron and Apache hold 50% each of the joint venture.</p> <p>in opposite way, Chevron pays \$550 million to Apache to take 50% shares in the Horn River and Liard basins.</p> <p>With this new financial set up, Chevron will also take 50% interests in the Pacific Trail Pipeline.</p> <p>Chevron Canada will assume operatorship of the LNG plant and the pipeline. Apache Canada increased its ownership in the LNG plant and pipeline from 40 percent and will operate the upstream assets.</p> <p>The Kitimat LNG trains will be located at Bish Cove, 650 kilometers north of Vancouver.</p> <p>-- October 2013 -- Chevron's plans for a Kitimat liquefied natural gas terminal will only be finalized if the company finds tax certainty in B.C., and workable Asian contracts for the \$4.5-billion project,</p> <p>-- January 2014 -- Fluor, in joint venture with JGC, was awarded the EPC contract for the proposed Kitimat LNG project in Bish Cove, British Columbia, Canada. The project scope includes completion of the existing FEED package by finalizing value-improving concepts for the proposed LNG facility.</p> <p>The scope of work also includes detailed engineering and procurement services for the initial phases of the project.</p> <p>The project will be performed by Fluor and its joint venture partner, JGC, leveraging the global capabilities and expertise from both companies with project work to be executed from their North America and Asia Pacific offices.</p> <p>-- August 2014 -- Apache announced to be willing to sell its 50% stake in Kitimat LNG, putting the project on hold.</p> <p>-- December 2014 -- Apache has sold off its interest in the Kitimat liquefied natural gas project in northern British Columbia to an Australian company, Woodside Petroleum Ltd.</p> <p>Woodside bought the Kitimat project and Apache interest in the Wheatstone LNG terminal in Western Australia, as well as accompanying upstream oil and gas reserves, for \$2.75 billion US</p>					

Project Market Data



Document reference |

CHEVRON KITIMAT LNG II







Document reference |

## CHEVRON KITIMAT LNG II

Last up date		Date	25/12/2013		
Last up date year		2013			
Status		Active			
Project Names		Chevron Kitimat LNG II	Apache LNG 2		
Project Site Country		Canada			
End User	Project End user Name	Chevron			
	End Users & Stakeholders	Apache Corporation	Chevron		
	End Users Countries	USA	USA		
	Key Stakeholders	Financial Minority	Operational Leader		
	Expected year of Completion	2019			
"Feed Engineering Company (Front End Engineering & Design)"	Bidders				
	Awarded	KBR			
	FEED Companies Country	USA			
	FEED Stage year	2013			
"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name				
	PMC or EPCM Country				
	Year of appointment				
"EPC Company (Engineering, Procurement & Construction)"	Bidders				
	Awarded				
	EPC Company Country				
	EPC Stage year	2016			
Main Standards		ANSI/NEMA			
Sourcing Strategy		Global			
General Information about the project					
<p>Liard Basin tops best shale gas fields in North America</p> <p>The Houston, Texas-based, Apache Corporation (Apache) announced the shale gas Liard Basin in British Columbia (BC), Canada, to contain 48 trillion cf of marketable natural gas.</p> <p>In addition the tests performed by Apache through three wells have reported that the shale gas of the Liard Basin is among the best and highest quality shale gas reservoirs in North America.</p> <p>The Liard Basin is located approximately 150 km north of Fort Nelson, British Columbia.</p> <p>The first well, the D-34-K, was drilled in 2009 and appeared immediately to be very prolific in producing 21 million cf/d during its first month. This well requested only six fracks to release its natural gas instead of eighteen or more usually needed in the area.</p> <p>During this testing period Apache managed to keep public attention off from its discovery and to acquire 174,000 hectares of land in that Liard Basin on the west side of the Horn River.</p> <p>Apache estimates that the Liard Basin field may contain up to 210 trillion cf (tcf) of natural gas out of which 48 tcf may be extracted and monetized. By way of comparison, all companies active in the Horn River Basin, have a total of marketable natural gas of 78 trillion cubic feet.</p> <p>With 48 tcf, Apache would then own more than two-thirds the size of the entire Horn Basin.</p> <p>The other two wells drilled since the first tests produced at the same level in quantity and quality as the first one.</p> <p>Actually the natural gas from the Liard wells is already being sold by Apache through a pipeline connecting them to Fort Nelson.</p> <p>Apache to convince Encana and EOR to double Kitimat LNG</p> <p>A fourth well is on going considering that each well in the shale gas Liard Basin costs \$35 million capital expenditure until completion for natural gas production. Despite this high cost, Apache made the calculation of a break-even price for the natural gas at the wellhead around \$2.57 per thousand cf.</p> <p>Thus the Liard Basin should be competitive compared with actual market conditions where natural gas is traded at \$1.78 per thousand cf at the Alberta hub, below the U.S prices at \$2.60 a thousand cf.</p> <p>The find by Apache Corp., one of three partners with Encana and EOG Resources in the \$4.5 billion Kitimat LNG terminal and pipeline proposal, is estimated to contain enough natural gas in itself to justify doubling the size of the Kitimat LNG terminal.</p> <p>Apache and its partners plan a five-million-tonne-a-year LNG plant and export terminal in Kitimat which, if supply and demand warrant it, could be doubled to 10 million tonnes a year.</p> <p>The Liard Basin alone could provide that additional five million tonnes of LNG for many years.</p> <p>Considering that the LNG is contracted in Asia around \$16 per thousand cf, Apache should not have too much difficulties to convince his partners, Encana and EOG Resources, to double capital expenditure in Kitimat LNG after the shale gas Liard Basin discovery.</p> <p>January 2013</p> <p>Chevron takes over EOR and Encana interests in Kitimat LNG and Apache buys 10% stakes to Chevron so that Chevron and Apache hold 50% each of the joint venture.</p> <p>in opposite way, Chevron pays \$550 million to Apache to take 50% shares in the Horn River and Liard basins.</p> <p>With this new financial set up, Chevron will also take 50% interests in the Pacific Trail Pipeline.</p> <p>Chevron Canada will assume operatorship of the LNG plant and the pipeline. Apache Canada increased its ownership in the LNG plant and pipeline from 40 percent and will operate the upstream assets.</p> <p>The Kitimat LNG trains will be located at Bish Cove, 650 kilometers north of Vancouver.</p> <p>--October2013--Chevron's plans for a Kitimat liquefied natural gas terminal will only be finalized if the company finds tax certainty in B.C., and workable Asian contracts for the \$4.5-billion project,</p>					

Project Market Data



Document reference |

GULF COAST LNG





Document reference |

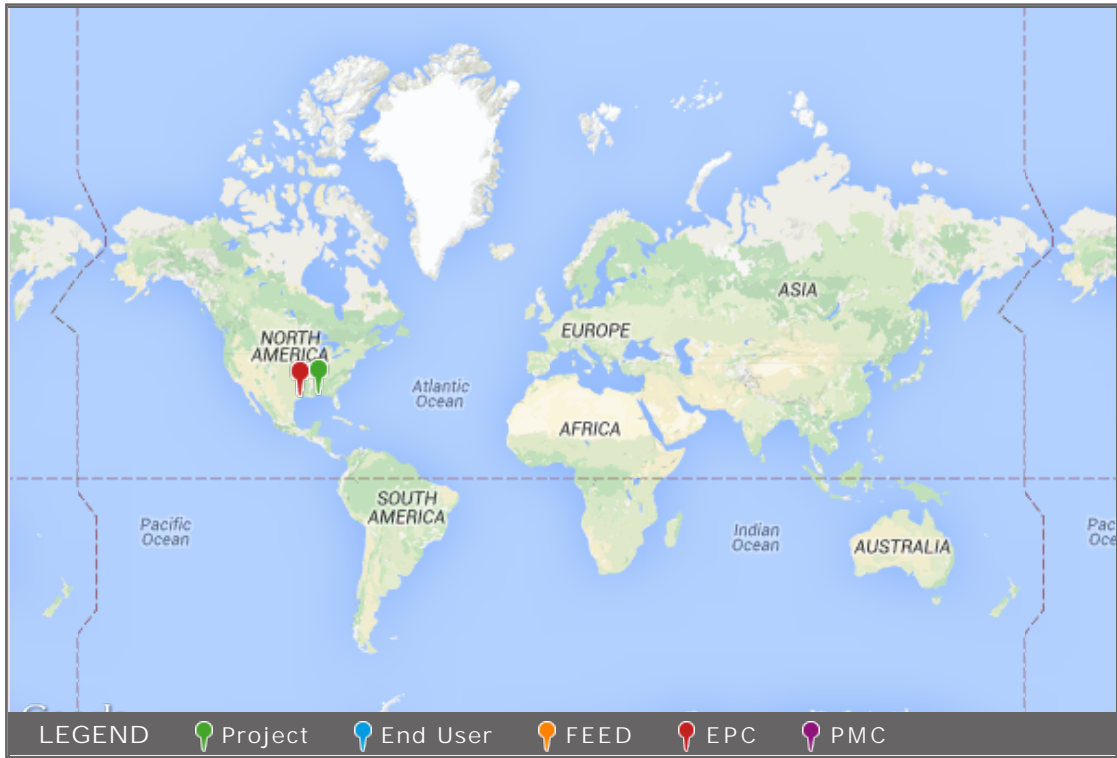
## GULF COAST LNG

Project Market Data	Last up date		Date	28/12/2014			
	Last up date year		2014				
	Status		Active				
	Project Names		Gulf Coast LNG				
	Project Site Country		USA				
	End User	Project End user Name		Gulf Coast LNG Export LLC			
		End Users & Stakeholders		Gulf Coast LNG Export LLC			
		End Users Countries		USA			
		Key Stakeholders		Operational Leader			
		Expected year of Completion		2019			
	"Feed Engineering Company (Front End Engineering & Design)"	Bidders					
		Awarded		KBR			
		FEED Companies Country		USA			
		FEED Stage year		2014			
	"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name					
		PMC or EPCM Country					
		Year of appointment					
	"EPC Company (Engineering, Procurement & Construction)"	Bidders		KBR			
		Awarded					
		EPC Company Country					
EPC Stage year		2016					
Main Standards		ANSI/NEMA					
Sourcing Strategy		Global					
General Information about the project							
<p>Gulf Coast is a Delaware limited liability company with its principal place of business in Houston, Texas. Gulf LNG and Gulf LNG Energy are wholly owned subsidiaries of Gulf LNG Holdings Group LLC, which is held 50% by Southern Gulf LNG Co. LLC, itself a wholly owned subsidiary of El Paso Pipeline Partners LP; 38% directly and indirectly by GE Energy Financial Services; and 12% indirectly by other investors. Gulf Coast states that the Brownsville Terminal will include four trains capable of liquefying up to 2.8 Bcf/d of natural gas, a marine berth, full containment LNG storage tanks, a pipeline connection to natural gas transportation lines, and associated utilities. Gulf Coast states that rather than entering into long-term natural gas supply or LNG export contracts, it contemplates that its business model will be based primarily on Liquefaction Tolling Agreements (LTAs), under which individual customers who hold title to natural gas will have the right to deliver that gas to Gulf Coast and receive LNG. Gulf Coast states that in the current natural gas market, LTAs fulfill the role previously performed by long-term supply contracts, in that they provide stable commercial arrangements between companies involved in natural gas services.</p> <p>-- May 2014 -- Gulf LNG has hired KBR to provide a US Federal Energy Regulatory Commission front-end engineering and design (FEED) and prefiling services contract in support of Gulf LNG application to build an export plant at the existing LNG terminal near Pascagoula, Miss. Under the contract, KBR will perform engineering for two 5-million-tonne/year LNG trains and associated facilities based on KBR design, which employs Air Products &amp; Chemicals Inc. propane precooled mixed refrigerant (AP-C3MR) technology. KBR will also provide the technical documentation required by FERC during the prefiling process.</p> <p>The Gulf LNG Liquefaction Project will be constructed in two phases:</p> <ul style="list-style-type: none"> <li>- Phase I will consist of a single liquefaction train capable of liquefying up to 5 million tons per annum (MTPA) of natural gas. The LNG produced by this train will be stored in the terminal's two existing LNG storage tanks which have a combined capacity of 320,000 cubic meters (equivalent to 6.6 billion standard cubic feet of natural gas). The stored LNG will then be loaded onto ships berthed at the existing dock facility, which is currently permitted to receive up to 170,000 cubic meter LNG vessels and designed to handle vessels with capacities of up to 250,000 cubic meters.</li> <li>- Phase II of the project will consist of a second liquefaction train identical in size to the first train, providing a total project liquefaction capacity of 10 MTPA.</li> </ul> <p>Both phases of the Gulf LNG Liquefaction Project will take advantage of additional existing terminal infrastructure, including electrical and mechanical utilities, control buildings, and the 5-mile 36-inch diameter Pipeline</p>							



Document reference |

KINDER MORGAN GULF LNG EXPORT TERMINAL





Document reference |

## KINDER MORGAN GULF LNG EXPORT TERMINAL

Project Market Data	Last up date		Date	28/12/2014			
	Last up date year		2014				
	Status		Active				
	Project Names		Kinder Morgan Gulf LNG Export Terminal				
	Project Site Country		USA				
	End User	Project End user Name		Kinder Morgan Inc.			
		End Users & Stakeholders		Kinder Morgan Inc.	GE		
		End Users Countries		USA	USA		
		Key Stakeholders		Operational Leader	Financial Minority		
		Expected year of Completion		2019			
	"Feed Engineering Company (Front End Engineering & Design)"	Bidders					
		Awarded		KBR			
		FEED Companies Country		USA			
		FEED Stage year		2014			
	"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name					
		PMC or EPCM Country					
		Year of appointment					
	"EPC Company (Engineering, Procurement & Construction)"	Bidders					
		Awarded		KBR			
		EPC Company Country		USA			
EPC Stage year		2016					
Main Standards		ANSI/NEMA					
Sourcing Strategy		Global					
General Information about the project							
<p>May 2nd 2012, Gulf LNG Liquefaction Company,LLC (GLLC) filled an application to export up to 11.5 million t/y of LNG. This LNG plant should be built in the actual import LNG terminal located in Pascagoula, Mississippi, USA. Gulf LNG is a 50/50 joint venture of El Paso, since acquired in May 25th by Kinder Morgan, and GE Financial Services. El Paso (Kinder Morgan) is the operator through its wholly owned subsidiary Southern Gulf LNG.</p> <p>-- May 2014 -- KBR was contracted to do the front-end design work on the Gulf LNG Liquefaction Project " which is 50 percent-owned Kinder Morgan. The deal will provide engineering work to the LNG export project prior to the project undergoing Federal Energy Regulatory Commission (FERC) review. The project is meant to support the addition of 10 million metric tons per year of liquefaction and export capabilities to the existing import terminal. Under the terms of the contract, KBR will perform engineering for two LNG trains " each five million metric tons per year " and associated facilities based on KBR reference design using its APCI C3MR Technology. Additionally, KBR will provide the technical documentation required by FERC during the pre-filing process. These facilities will allow the terminal to liquefy domestic natural gas delivered by pipeline, store the LNG in the terminal's existing LNG storage tanks, and load it into LNG vessels via the terminal's existing marine jetty.</p> <p>-- December 2014 -- Kinder Morgan is estimating beginning construction on the LNG export project in 2016 with the two LNG trains coming online in 2019 and 2020.</p>							



Document reference |

LNG MAGNOLIA LNG LAKE CHARLES





Document reference |

## LNG MAGNOLIA LNG LAKE CHARLES

Last up date		Date	03/02/2015		
Last up date year		2015			
Status		Active			
Project Names		LNG Magnolia LNG Lake Charles			
Project Site Country		USA			
End User	Project End user Name	LNG Ltd			
	End Users & Stakeholders	LNG Ltd			
	End Users Countries	Australia			
	Key Stakeholders	Operational Leader			
	Expected year of Completion	2019			
"Feed Engineering Company (Front End Engineering & Design)"	Bidders				
	Awarded	KBR			
	FEED Companies Country	USA			
	FEED Stage year	2015			
"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name				
	PMC or EPCM Country				
	Year of appointment				
"EPC Company (Engineering, Procurement & Construction)"	Bidders				
	Awarded	SK Engineering & Construction			
	EPC Company Country	South Korea			
	EPC Stage year	2016			
Main Standards		ANSI/NEMA			
Sourcing Strategy		High Value or Low Costs Countries			
General Information about the project					
<p>Magnolia LNG, a newly formed, wholly-owned subsidiary of Liquefied Natural Gas Limited (LNG Ltd), is developing an up to 8 million tonne per annum (mtpa) mid-scale LNG facility in the Port of Lake Charles, Louisiana, USA using its highly efficient and patented OSM technology (Project). The Project will access approximately 90 acres of available land in Lake Charles, Industrial Canal South Shore PLC Tract 475, (Site) through a long-term lease with the Lake Charles Harbor &amp; Terminal District.</p> <p>LNG Ltd's wholly owned OSMR's liquefaction technology and development methodology results in lower capital cost, lower operating cost, faster construction, and improved efficiency</p> <p>Feed gas for the Project will be sourced from the highly liquid US gas market via several gas suppliers. Gas will be delivered to the site via two existing underutilised pipeline infrastructure that traverses the Site. Two additional gas pipelines are located within 3 miles of the site. Consequently, very short interconnect pipelines will be required to tie-in to the existing pipeline(s).</p> <p>On 18 December 2012 Magnolia LNG filed an application with the U.S. Department of Energy, Office of Fossil Energy (DOE/FE) seeking long-term multi-contract authorization to export up to 4mtpa of liquefied natural gas (LNG) to Free Trade Agreement (FTA) countries. Authorisation is expected to be granted by DOE/FE in first quarter 2013. Authorisation is required by US law to be granted within 90 days of the filing date. Magnolia LNG will provide cost effective liquefaction services under an LNG Tolling Agreement enabling LNG sales to these FTA countries.</p> <p>Magnolia LNG has also commenced activities that relate to the Federal Energy Regulatory Commission's (FERC) authorization and other necessary environmental permits to site, construct, and operate the Project. Early preliminary activities include a Safety Assessment for the LNG facility, a Waterway Suitability Assessment (WSA), geotechnical studies, and studies required to ensure a timely and smooth approvals process.</p> <p>A detailed Permitting &amp; Approvals Roadmap has also been prepared by a local US consultant that outlines the related tasks over the next 24 months. In accordance with the FERC approval process, Magnolia LNG is anticipating submitting its formal Pre-File application by March 2013.</p> <p>The five key early milestones targeted for the Project are:</p> <ul style="list-style-type: none"> <li>• Receipt of DOE FTA Approval February 2013</li> <li>• Submit Pre-Filing Application to FERC March 2013</li> <li>• Selection of Project partners June 2013</li> <li>• Submit Filing Application to FERC December 2013</li> <li>• Final Investment Decision December 2014 (subject to FERC approvals)</li> </ul> <p>The Project will comprise a full containment LNG tank of ~ 200,000 m3 in accordance with NFPA 59A and FERC guidelines. The industrial canal will enable LNG Carriers (up to 170,000 m3 Membrane) to access the Site using the existing swing basin. The Site is adjacent to the existing Trunkline LNG Terminal, and so LNG Carriers have been previously operational in the main Calcasieu Channel and Industrial Canal.</p> <p>The Project will largely benefit from the Front End Engineering Design (FEED) recently undertaken for the Fisherman's Landing LNG Project in Gladstone, Queensland, Australia. This will assist in expediting the permit approvals process.</p> <p>The indicative capital estimate is US\$2.2 billion for the Project (4 mtpa). The resulting cost of ~ US\$550 per LNG tonne would be the lowest export LNG capital cost in the US and one of the key success factors of the Project.</p> <ul style="list-style-type: none"> <li>--February2014--Magnolia LNG signed MOU with SK Engineering and Construction (SK E&amp;C) to provide :             <ul style="list-style-type: none"> <li>- Front-end engineering design (FEED) and open book costing</li> <li>- Engineering, procurement and construction (EPC) under a fixed-price</li> </ul> </li> </ul> <p>The initial price estimate for the work is \$1.57 billion, which is in-line with Magnolia LNG estimates.</p> <ul style="list-style-type: none"> <li>-- March 2014 -- Magnolia LNG has received approval from the US Department of Energy (DOE) for the export of 8 million tonnes per year of LNG to free trade agreement (FTA) countries.</li> </ul> <p>Authorisation for export is valid for first LNG sales expected to start within 10 years, and then for 25 years after that.</p> <ul style="list-style-type: none"> <li>-- May 2014 -- LNG Magnolia received FERC approval</li> <li>-- February 2015 -- KBR and SKEC to execute EPC Joint Venture Agreement (JVA) on a 70/30 percent participation basis, respectively, to deliver the 8 mtpa four train Magnolia LNG Project</li> </ul> <p>KBR will be the leader of the EPC Contract</p> <p>Magnolia LNG on schedule for Financial Close in mid-2015 and first LNG in fourth quarter 2018.</p> <p>Under the Technical Services Agreements the parties will complete all due diligence in relation to technical commercial and contractual matters that will enable the EPC JV to execute a lump sum, turnkey engineering procurement, construction, commissioning, start-up and performance testing EPC Contract for the LNG</p>					

Project  
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plant.

Magnolia LNG has set the following milestone schedule:

- February 2015: JV Agreement between KBR and SKEC
- March 2015: Initialling EPC Contract between Magnolia LNG and the JV
- April 2015: EPC Contract signing between Magnolia LNG and JV





Document reference |

LYONDELLBASELL CHANNELVIEW ETHYLENE SECOND EXPANSION





Document reference |

## LYONDELLBASELL CHANNELVIEW ETHYLENE SECOND EXPANSION

Project Market Data	Last up date		Date	24/12/2014			
	Last up date year		2014				
	Status		Active				
	Project Names		LyondellBasell Channelview Ethylene Second Expansion				
	Project Site Country		USA				
	End User	Project End user Name		Lyondellbasell			
		End Users & Stakeholders		Lyondellbasell			
		End Users Countries		USA			
		Key Stakeholders		Operational Leader			
		Expected year of Completion		2017			
	"Feed Engineering Company (Front End Engineering & Design)	Bidders					
		Awarded		KBR			
		FEED Companies Country		USA			
		FEED Stage year		2014			
	"PMC or EPCM Company Engineering Company (Project manager Consultant oe EPC Manager) if appointed"	Name					
		PMC or EPCM Country					
		Year of appointment					
	"EPC Company (Engineering, Procurement & Construction)"	Bidders					
		Awarded		KBR			
		EPC Company Country		USA			
EPC Stage year		2015					
Main Standards		ANSI/NEMA					
Sourcing Strategy		Global					
General Information about the project							
<p>The global chemical and plastics manufacturer LyondellBasell is considering an additional expansion of the ethylene production on its Channelview facility in Texas USA.</p> <p>During the last twenty years, LyondellBasell has grown up pretty fast in Europe and North America mainly through acquisitions. The accumulation of debts to finance the acquisitions and the 2008 crisis led LyondellBasell to apply for the Chapter 11 protection in US in 2009. After cleaning its balance sheet and optimizing its diversified assets portfolio, LyondellBasell was well positioned to benefit from the shale gas development in the US to restore a competitive model of petrochemical activities.</p> <p>In this new context, LyondellBasell opted for organic growth in investing in series of debottlenecking projects in its existing chemical complexes in Channelview, Corpus Christi and La Porte, all in Texas USA.</p> <p>In a period when engineering and contracting resources are all absorb by the multiplication of projects in North America, LyondellBasell strategy, in proceeding by mid-sized investments, enable an implementation on fast track of these expansions.</p> <p>In Corpus Christi, LyondellBasell started up in 2013 in joint venture with TexStar a new natural gas liquids (NGL) plant in order to increase its supply capacities. From this first step, LyondellBasell is now working on a new ethylene cracker to add 360,000 tonnes per year (t/y) capacity expected to run into commercial operations in 2016.</p> <p>In parallel, LyondellBasell is currently completing in La Porte the 100,000 t/y polyethylene debottlenecking project and the 400,000 t/y ethylene cracker expansion.</p> <p><b>New LyondellBasell Channelview Ethylene Expansion</b></p> <p>Regarding Channelview, LyondellBasell restarted its 780,000 t/y methanol that was idled since 2004. This methanol facility is then supplying LyondellBasell acetic acid and methy terbutyl ether (MTBE) units on the same site in Channelview. As part of the debottlenecking program, LyondellBasell initiated the capacity increase of Channelview ethylene cracker by 113,000 t/y. To support this additional capacity, LyondellBasell is building two cracking furnaces in Channelview. LyondellBasell is planning to turn these new Channelview ethylene crackers by 2015.</p> <p>Since this small steps strategy of investment is proving to deliver the projects on time and at budgeted costs, LyondellBasell is encouraged to continue in the same way as long as the domestic demand and the existing sites are supporting these series of capacity increases. Taking the advantage of the modular design of these ethylene crackers, LyondellBasell has decided to repeat the successful experience and announced a new expansion at the Channelview ethylene plant.</p> <p>With this new investment, LyondellBasell is planning to increase capacity by 270,000 t/y of ethylene in Channelview.</p> <p>As this project will be executed in continuation of the on going cracker furnaces project, LyondellBasell expect this new Channelview Ethylene Expansion project to be in operation by 2017.</p>							



Document reference |

LYONDELLBASELL CORPUS CHRISTI ETHYLENE EXPANSION





Document reference |

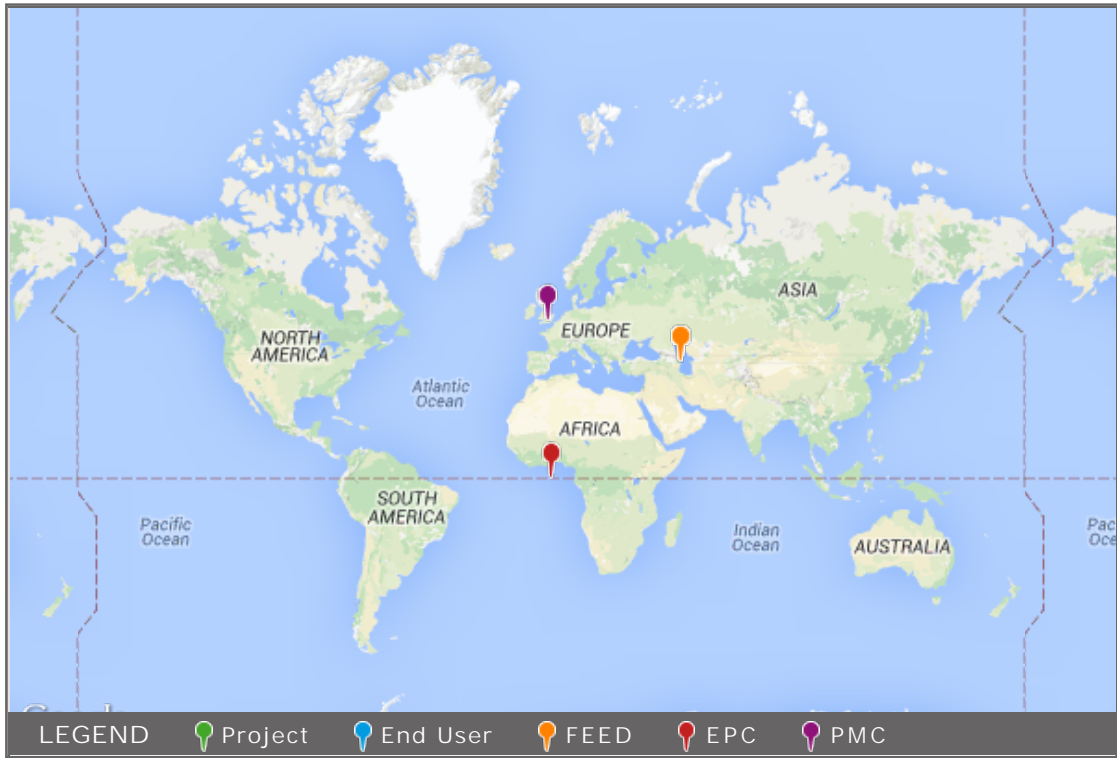
## LYONDELLBASELL CORPUS CHRISTI ETHYLENE EXPANSION

Project Market Data	Last up date		Date	22/05/2014			
	Last up date year		2014				
	Status		Active				
	Project Names		LyondellBasell Corpus Christi Ethylene Expansion				
	Project Site Country		USA				
	End User	Project End user Name		Lyondellbasell			
		End Users & Stakeholders		Lyondellbasell			
		End Users Countries		Netherlands			
		Key Stakeholders		Operational Leader			
		Expected year of Completion		2016			
	"Feed Engineering Company (Front End Engineering & Design)	Bidders					
		Awarded		KBR			
		FEED Companies Country		USA			
		FEED Stage year		2014			
	"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name					
		PMC or EPCM Country					
		Year of appointment					
	"EPC Company (Engineering, Procurement & Construction)"	Bidders					
		Awarded		KBR			
		EPC Company Country		USA			
		EPC Stage year		2015			
	Main Standards		ANSI/NEMA				
	Sourcing Strategy		Global				
	General Information about the project						
<p>LyondellBasell plans to add an additional 800m lb/year (363,000 tonnes/year) of ethylene capacity at its cracker at Corpus Christi, Texas, by late 2015, a senior executive said on Wednesday.</p> <p>“This investment of around \$420m (€323m) could add \$250m-300m in annual potential growth value,” said Tim Roberts, senior vice president of olefins and polyolefins Americas.</p> <p>He spoke at the company’s annual investor day.</p> <p>It was the first time LyondellBasell announced planned additional capacity for its Corpus Christi expansion.</p> <p>Currently, LyondellBasell has an ethylene capacity of 771,000 tonnes/year at Corpus Christi</p> <p>--November2013-- The Corpus Christi expansion is still in the permitting phase, with construction slated to begin once permits are received. Projected start-up is expected on early 2016.</p>							



Document reference |

SOCAR BAKU OIL & GAS PROCESSING AND PETROCHEMICAL COMPLEX (OGPC) PETROCHEMICAL





Document reference |

## SOCAR BAKU OIL & GAS PROCESSING AND PETROCHEMICAL COMPLEX (OGPC) PETROCHEMICAL

Last up date		Date	27/04/2015		
Last up date year		2015			
Status		Active			
Project Names		Socar Baku Oil & Gas Processing and Petrochemical Complex (OGPC) Petrochemical			
Project Site Country		Azerbaijan			
End User	Project End user Name	State Oil Company of Azerbaijan Republic (SOCAR)			
	End Users & Stakeholders	State Oil Company of Azerbaijan Republic (SOCAR)			
	End Users Countries	Azerbaijan			
	Key Stakeholders	Operational Leader			
	Expected year of Completion	2022			
"Feed Engineering Company (Front End Engineering & Design)"	Bidders				
	Awarded	KBR			
	FEED Companies Country	Azerbaijan			
	FEED Stage year	2015			
"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name	Fluor			
	PMC or EPCM Country	UK			
	Year of appointment	2015			
"EPC Company (Engineering, Procurement & Construction)"	Bidders				
	Awarded				
	EPC Company Country				
	EPC Stage year	2017			
Main Standards		IEC			
Sourcing Strategy		Global			
General Information about the project					
<p>The State Oil Company of Azerbaijan (SOCAR) selected the Houston-based engineering company KBR to provide project management consultancy (PMC) for the front end engineering and design (FEED) of the gas processing plant (GPP) within its Oil &amp; Gas Processing and Petrochemical Complex (OGPC) project in Azerbaijan.</p> <p>In April 2012, SOCAR presented in Baku this \$17 billion capital expenditure downstream project.</p> <p>To be located on 1,500 hectares 60 kilometers from Baku in the Garadagh district of Baku, the so called OGPC project should include a refinery and a gas processing plant and a petrochemical complex.</p> <p>In March 2013, SOCAR is sending the signal to move on with this project.</p> <p>This decision comes in parallel to major decisions made by SOCAR to develop multi-billion oil and gas projects on the upstream side.</p> <p>In May 2012, BP and SOCAR decided to commence the FEED for the \$25 billion capital expenditure Shah Deniz phase 2 project.</p> <p>In January 2013, Statoil and SOCAR opened negotiations to share interests in the giant Umid gas field together with the Babek and Mashal satellite fields in the Azeri Caspian Sea.</p> <p>In March 2013, SOCAR and ConocoPhillips started hearing program in 14 Azeri regions to get the permit of 2D seismic exploration onshore campaign.</p> <p>The selection of the routes in competition for the export pipelines to Europe should come on second half 2013.</p> <p>With the upstream and midstream pieces well engaged, SOCAR had to align the downstream part to complete its energy giant puzzle.</p> <p>Since Azerbaijan is one of the few countries in the world with significant reserves of oil as well as natural gas, the development of downstream projects requires balanced capital expenditure between gas processing facilities and crude oil refining.</p> <p>Then this balanced sourcing between natural gas and crude oil gives the opportunity to SOCAR to optimize the petrochemical chain in benefiting from the both sources of supply as feedstock.</p> <p>Fluor selects technology licensors for SOCAR OGPC</p> <p>Actually estimated to require \$17 billion capital expenditure, the Oil &amp; Gas Processing and Petrochemical Complex (OGPC) in Baku should include a:</p> <ul style="list-style-type: none"> <li>- Gas processing plant (GPP) to treat the raw natural gas coming from ACG, Shah Deniz phase 2 or Umid and separate it into ethane, propane, butane, methane</li> <li>- Ethane cracker to produce olefins and polyolefins</li> <li>- Crude oil refinery</li> </ul> <p>In this context, SOCAR is starting to award the key contracts for this OGPC project.</p> <p>SOCAR selected KBR to provide the project management consultancy (PMC) services for the FEED phase of the gas processing plant.</p> <p>KBR has a long standing experience of working in Azerbaijan and cooperating with SOCAR.</p> <p>The PMC services will be provided by KBR local office in Baku, Azerbaijan.</p> <p>The FEED work will be supported from KBR London Office in UK.</p> <p>The project feasibility study was made by Technip, Foster Wheeler, and UOP.</p> <p>From their conceptual study, the SOCAR defined the capacity of its OGPC project based on:</p> <ul style="list-style-type: none"> <li>- 10 to 12 billion cm<sup>3</sup>/y for the gas processing plant</li> <li>- 2 million t/y for the ethylene cracker</li> <li>- 670 000 t/y polyethylene (PE) unit</li> <li>- 550 000 t/y polypropylene (PP) unit</li> <li>- 200,000 b/d (10 million t/y) refinery including 20 processing units</li> </ul> <p>With this OGPC project, SOCAR is intending to supply the local market with the refined products to cover the increase of the domestic consumption in transportation fuels, while the natural gas and the petrochemical products should be exported.</p>					

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KBR is expecting the FEED work of the gas processing plant to be completed at the end of 2013, so that SOCAR should be able to start commercial operations with the OGPC project in 2020.

-- December 2014 -- SOCAR has delayed the completion of a major plant to process oil, gas and petrochemicals worth up to \$16.5 billion near the capital Baku by four years until 2030 due to a lack of funds.

The construction of a gas processing plant and a petrochemicals plant worth \$8.45 billion was now due to be completed by 2020 instead of 2017, while an oil refinery worth \$8 billion was expected to be completed by 2030 and not 2026.

The new complex will replace SOCAR's two ageing downstream refineries - the Baku Oil Refinery and the Oil Refinery Azerneftiyag, both in Baku, as well as the Garadagh Gas Processing Plant and facilities of chemicals firm Azerikimya.

The facility will be built 60 kilometres south of Baku, at Sangachal, where Azerbaijan main oil and gas pipelines reach the Caspian Sea

-- March 2015 -- SOCAR awarded Fluor a contract to provide project management contractor (PMC) services for its new oil-gas processing and petrochemical complex (OGPC) in Azerbaijan.

The OGPC megaproject will be located on a greenfield site 60 kilometres southwest of Baku.

As the project management contractor, Fluor will support SOCAR selection and management of future contractors that will perform detailed engineering, procurement, construction, commissioning and start-up of the gas processing plant as well as front-end engineering design, detailed engineering, procurement, construction, commissioning and start-up of the petrochemical plants including associated offsite facilities.

The project will be performed from Fluor UK office in Farnborough where the company serves a wide range of industries including energy, chemicals, government, industrial, infrastructure, mining and power market sectors.

In parallel KBR signed a joint venture (JV) agreement with SOCAR to establish a new engineering and support services company in Azerbaijan.

With support from KBR and SOCAR, the new company will provide design, engineering, technical, procurement, construction supervision and project management service for projects across the upstream, midstream and downstream oil and gas sectors, primarily in the Republic of Azerbaijan.

The company will also prepare technical requirements for all stages of a project, including project management, contract supervision, planning and cost control. Additionally, it will train and develop the local workforce and supervise contractors throughout all stages of a project -- from startup through construction and into performance testing.

The JV will be located in Baku.

-- April 2015 -- Socar selected Ineos technology for the medium and high density polyethylene units



Document reference |

STATOIL TANZANIA LNG







Document reference |

## STATOIL TANZANIA LNG

Project Market Data	Last up date	Date	09/04/2015			
	Last up date year	2015				
	Status	Active				
	Project Names	Statoil Tanzania LNG				
	Project Site Country	Tanzania				
	End User	Project End user Name	Statoil			
		End Users & Stakeholders	Statoil	ExxonMobil	Tanzania Petroleum Development Cooperation (TPDC)	
		End Users Countries	Norway	USA	Tanzania	
		Key Stakeholders				
		Expected year of Completion	2022			
	"Feed Engineering Company (Front End Engineering & Design)"	Bidders				
		Awarded	KBR			
		FEED Companies Country	USA			
		FEED Stage year	2015			
	"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name				
		PMC or EPCM Country				
		Year of appointment				
	"EPC Company (Engineering, Procurement & Construction)"	Bidders				
		Awarded				
		EPC Company Country				
EPC Stage year		2018				
Main Standards	IEC					
Sourcing Strategy	Global					
General Information about the project						
<p>Statoil to convert Zafarani high gas discovery into LNG</p> <p>In 2007, Statoil and ExxonMobil signed a production sharing contract (PSC) with the national oil company (NOC) Tanzania Petroleum Development Cooperation (TPDC) for the exploration and production of the Block 2 offshore Tanzania in the Indian Ocean.</p> <p>This Block 2 is located in southern Tanzania's territorial waters close to the frontier with Mozambique.</p> <p>Lying in water depths varying between 400 to 3,000 meters, the Block 2 is divided in two parts approximately 100 and 200 kilometers away from shore.</p> <p>According to the production sharing contract (PSC) signed between parties for the Block 2, Statoil and ExxonMobil share working interests for the exploration phase as following:</p> <ul style="list-style-type: none"> <li>- Statoil 65% is the operator</li> <li>- ExxonMobil 35%</li> </ul> <p>In case the partners would decide to move on production phase, the national oil company (NOC), TPDC would take 10% working interest in the Block 2.</p> <p>On early 2012, Statoil drilled successfully the first exploratory well called Zafarani-1 by 2,600 meters water depth and 5.100 meters total depth.</p> <p>With Zafarani-1 discovery, Statoil made a first estimation of the Block 2 natural gas recoverable reserves around 5 trillion cubic feet (tcf).</p> <p>On mid 2012, a second prospect well, named Lavani, was drilled in the Block 2 and allowing Statoil to double recoverable reserves and to qualify Zafarani as High impact gas discovery to be compared with Statoil's other high impact discoveries such as Johan Sverdrup, Skrugard and Havis, or Peregrino South.</p> <p>KBR signed pre-FEED for Statoil Tanzania LNG project</p> <p>At this stage of the exploration of the Block 2, Statoil and ExxonMobil, estimate the discovery large enough to start working on the monetization of this natural gas through onshore LNG Trains.</p> <p>In a first step, Statoil and ExxonMobil awarded to KBR a contract for the pre-front end engineering and design (pre-FEED) for a prospective liquefied natural gas (LNG) facility in Tanzania, East Africa.</p> <p>If Asia is the preferred destination to export gas since the market prices are still based on long term contracts calculated on a basket of oil and gas prices through the JCC contracts, the number of projects to develop natural gas in Australia, Indonesia and on East Africa may intensify the competition on suppliers side.</p> <p>In addition USA is now working also on LNG export projects boosted by the development of the shale gas.</p> <p>In this context the costs estimation and the time frame of the natural gas projects must be analyzed carefully to compromise profitability when in commercial operations in four or five years from now.</p> <p>In the neighboring Mozambique, Anadarko is already proceeding with its Mozambique LNG project.</p> <p>Eni should either join Anadarko, either launch its own LNG project with the first priority.</p> <p>In moving on the pre-FEED shortly after few discoveries, Statoil shows that it does not want to waste time on the onshore part while implementing the offshore exploration.</p> <p>For these reasons and considering the long standing cooperation between Statoil, ExxonMobil and KBR, the pre-FEED studies are expected to be completed on first half 2013.</p> <p>With KBR's pre-FEED outcome, Statoil intends to evaluate in which conditions of size (two or three LNG Trains) and costs, an export LNG facility could monetize the discoveries of Zafarani and Lavani in the Block 2 offshore Tanzania.</p> <p>-- November 2014 -- Statoil Tanzania Operations Manager, Mr Thomas Mannes has said that, if all goes as planned, the plant will commence operations between 2022 or 2023.</p> <p>The project will take seven years upon its completion:</p> <ul style="list-style-type: none"> <li>- Soil studies to determine the stability of the site may take a year</li> <li>- Two years will be for engineering and design studies</li> <li>- About four years for actual construction</li> <li>- March 2015 -- In parallel to the onshore LNG Train project, Statoil is pilling up resources to prepared offshore development on its Block 2.</li> </ul> <p>Statoil Mdalasini-1 exploration well has resulted in a new natural gas discovery offshore Tanzania.</p> <p>The discovery of an additional 1.0-1.8 trillion cubic feet (tcf) of natural gas in place in the Mdalasini-1 well, brings the total of in-place volumes up to</p>						

approximately 22 tcf in Block 2.



Document reference |

SUNBIRD | BHUBESI GAS PROJECT (IGP) FPSO





Document reference |

## SUNBIRD IBHUBESI GAS PROJECT (IGP) FPSO

Last up date		Date	03/02/2015		
Last up date year		2015			
Status		Active			
Project Names		Sunbird Ibhubesi Gas Project (IGP) FPSO			
Project Site Country		South Africa			
End User	Project End user Name	Sunbird Energy			
	End Users & Stakeholders	Sunbird Energy	PetroSA		
	End Users Countries	Australia	South Africa		
	Key Stakeholders	Operational Leader	Financial Minority		
	Expected year of Completion	2018			
"Feed Engineering Company (Front End Engineering & Design)"	Bidders				
	Awarded	KBR			
	FEED Companies Country	Australia			
	FEED Stage year	2014			
"PMC or EPCM Company Engineering Company (Project manager Consultant or EPC Manager) if appointed"	Name				
	PMC or EPCM Country				
	Year of appointment				
"EPC Company (Engineering, Procurement & Construction)"	Bidders				
	Awarded				
	EPC Company Country				
	EPC Stage year	2015			
Main Standards		IEC			
Sourcing Strategy		Global			
General Information about the project					
<p>The Australian company Sunbird Energy (Sunbird) and its local partner, the national oil company (NOC) PetroSA, are considering to use a floating production, storage and offloading (FPSO) vessel to develop the Ibhubesi gas field offshore the west coast of South Africa.</p> <p>Discovered in 1981 by Forest Oil Corporation (Forest Oil) and Anschutz Corporation (Anschutz), the Ibhubesi gas field belongs to the Production Right Block 2A covering 5,000 square kilometers in the Orange Basin approximately 100 kilometers offshore the Northern Cape Province.</p> <p>In this Block 2A, Sunbird and PetroSA are sharing the working interests in such a way:</p> <ul style="list-style-type: none"> <li>- Sunbird 76% is the operator</li> <li>- PetroSA 24%</li> </ul> <p>Since 1981, two exploratory drilling campaigns were led, revealing all the potential of the wet gas field of Ibhubesi to become the largest gas field in South Africa.</p> <p>From the last assessment performed in June 2013, Ibhubesi is given to hold proven and probable reserves (2P) of:</p> <ul style="list-style-type: none"> <li>- 540 billion cubic feet of recoverable gas</li> <li>- 4.3 million barrels of recoverable condensate.</li> </ul> <p>In addition the Block 2A is suspected of significant resources upside with more than 5 trillion cubic feet (tcf) unrisks gross prospective resources with a nearly certain probability of P90.</p> <p>This resources upside will be subject to intensive exploration campaign that may take a couple of years more for conclusions.</p> <p>In this context, Sunbird and PetroSA are considering to develop Ibhubesi gas field in phases.</p> <p>Since South Africa is short of natural gas, any contribution of the Ibhubesi gas field development would meet sustainable demand on the local market.</p> <p>JP Kenny and KBR won Sunbird Ibhubesi pre-FEED</p> <p>For this Ibhubesi Phase-1 project, Sunbird selected the tandem JP Kenny from The Wood Group and Granherne from KBR to perform the pre-front end engineering and design (pre-FEED).</p> <p>While JP Kenny is working on the subsea system, Granherne is designing the FPSO.</p> <p>Since Sunbird took over Forest Oil and Anschutz interests in the Block 2A, it favored the FPSO concept in order to monetize immediately Ibhubesi valuable condensate reserves.</p> <p>Therefore, the condensate should be treated on the FPSO to be offloaded on tankers, while the natural gas should be piped out to shore.</p> <p>Although the Ibhubesi gas field is located only 100 kilometer from the shore, JP Kenny and KBR are considering a 400 kilometer subsea export pipeline up to potential power plants in the Northern Cape Province.</p> <p>In that respect, Sunbird and its partner PetroSA have two options with the existing diesel-fired Ankerlig power plant or with the projected Saldanha 474 MW gas-fired power plant.</p> <p>For this Ibhubesi Phase-1 project, Sunbird and PetroSA are planning to invest \$1.4 billion capital expenditure.</p> <p>Then for Ibhubesi Phase-2, Sunbird and its partner should invest \$400 million more to add new production wells.</p> <p>From the current planning, Sunbird and PetroSA expect JP Kenny and Granherne to complete their pre-FEED and FEED work in 2014 in order to commence the engineering, procurement and construction (EPC) of the Ibhubesi FPSO in 2015 for first production in 2017.</p> <p>-- February 2015 -- Sunbird is considering either a floating production, storage and offloading vessel (FPSO) or a semi-submersible production platform. The production facility would be anchored on site and two subsea riser pipe lines would connect the subsea manifold to the on-board production facility.</p> <p>The production facility would connect to a new, 400km-long, 14in. to 18in.-diameter offshore pipeline from the production facility to a shore-crossing site located between Grotto Bay and Duynfontein and one on the Saldanha peninsula.</p> <p>The pipeline would run parallel to the coast, close to the 200m contour line.</p> <p>Sunbird also proposes an onshore pipeline between the shore-crossing site and the Ankerlig power station near Atlantis, and proposed end users in Saldanha; as well as an onshore gas receiving facility.</p>					

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