ABU DHABI POLYMERS COMPANY BOROUGE 4 CARBON CAPTURE

Last up date		Date	1/26/2022			
Last up date year		2022				
Status		Active				
Project Names		Abu Dhabi Polymers Company Borouge 4 Carbon Capture				
Project Site Country		United Arab Emirates				
Project Site State		Abu Dhabi				
End User	Project End user Name	Abu Dhabi Polymers Company (Borouge)				
	End Users & Stakeholders	Abu Dhabi Polymers Company (Borouge)	Borealis	Abu Dhabi National Oil Company (ADNOC)		
	End Users Countries	United Arab Emirates	Austria	United Arab Emirates		
	Key Stakeholders	Operational Leader	Financial Minority	Financial Majority		
	Expected year of Completion	2027				
"Feed Engineering Company (Front End Engineering & Design)	Bidders	Linde;Maire Tecnimont;Technip Energies				
	Awarded					
	FEED Companies Country					
	FEED Stage year	2022				
"PMC or EPCM Company Engineering Company (Project manager Consultant oe EPC Manager) if appointed"	Name	Worley				
	PMC or EPCM Country	United Arab Emirates				
	Year of appointment	2019				
"EPC Company (Engineering, Procurement & Construction)"	Bidders	Linde;Maire Tecnimont;Technip Energies				
	Awarded					
	EPC Company Country					
	EPC Stage year	2023				
Main Standards		IEC				
Sourcing Strategy		Digital				

General Information about the project

Adnoc and Borealis starts studies on Borouge 4 to expand again their Petrochemical complex in Ruwais.
Abu Dhabi Polymers (Borouge) is a joint venture between the national oil company Abu Dhabi National Oil Company (Adnoc) and Austria-based Borealis chemical company.
Operating a large petrochemical complex at Ruwais, in the west of Abu Dhabi, Borouge has been developed in three major phases over the last fifteen years.
Designed by Bechtel, the last expansion (Borouge 3) had been executed and completed by the Chinese Wison Engineering for $1 billion capital expenditure.
Current production capacity is 4.5 million t/y, following the successful start-up of Borouge 3 in 2016.
The Borouge joint venture was established in 1998 and production has progressively ramped up with the completions of the Borouge 1, 2 and 3 complexes.
The agreement signed between Adnoc and Borealis said that their current joint venture, which began in 1998, will be reviewed for a possible extension beyond its first 30-year lifetime.
Adnoc is aiming to expand its petrochemicals production to 11.4 million tonnes per year (t/y) from the current 4.5 million t/y by 2025.
In this perspective, the Borouge 4 complex and a projected separate polypropylene plant will allow Adnoc to grow its current petrochemical production to almost 10 million t/y, enabling to take advantage of the market opportunities in Asia, where the high-grade polymer market is set to double by 2040.
Borouge 4 total capacity will be around 6 million t/y, supplied from the Ruwais refiner with output comprising:
- A world-scale mixed-feed cracker
- Polyolefins (polyethylene and polypropylene)
- Aromatics (e.g. benzene, butadiene).

Adnoc and Borealis are starting the pre-front end engineering and design (pre-FEED) work.
This pre-feed will take 9-10 months to be completed so that the FEED contract should be awarded on early 2019.
-- March 2018 -- The pre-FEED is on-going and should be completed soon, so that the FEED contract should be awarded on the next months.
Among the first conclusions of the pre-FEED, Adnoc and Borealis made the decision to select a naphtha cracker to produce ethylene.

Project Market

Data	In the actual circumstances of uncertainty on the barrel price, this decision may look strange but in counter part Abu Dhabi is depending on Qatar on the gas supply, therefore ethane cracker is not an option for now and foreseeing future. In this context the FEED work will be critical to ensure the financial viability of the naphtha-supplied new petrochemical complex for the production of ethylene and its derivatives. -- July 2018 -- The WorleyParsons Consulting company Advisian Pty Ltd (Advisian) is working on the pre-FEED of the project from its Abu Dhabi office. It is supported by London Office. This pre-FEED work should be converted into FEED by the end of the year. -- January 2019 -- Advisian (WorleyParsons) is progressing on the pre-FEED work so that the FEED contract should be awarded on Q1 2019. -- February 2019 -- Adnoc has short listed three engineering companies for Borouge 4 FEED contract: - Maire Tecnimont from Italy - Tecnicas Reunidas from Spain - Wood Group from UK Tecnicas Reunidas is reported in the lead of the competion, but Maire Tecnimont has accumulated a long experience in Ruwais in building the previous Borouge projects. Advisian or WorleyParsons may remain involved as project management consultant (PMC). The FEED contract should be awarded soon on Q1 2019. -- February 2019 -- Adnoc has decided to remain loyal to Maire Tecnimont for the FEED contract of Borouge 4. Anyway, Borouge 4 cracker will use TechnipFMC license. Adnoc also awarded the project management consultancy (PMC) contract to WorleyParsons. Assuming the FEED work to take one year, the final investment decision (FID) and the sanction of the engineering, procurement and construction (EPC) contract should come in 2021. -- January 2020 -- Adnoc has decided to modify the scope of the project to reduce costs. The mixed-cracker should be replaced by a simple ethane cracker. As a consequence, the previous budget of $4.5 billion capital expenditure should come down to $3 billion. This modification is becoming possible since Abu Dhabi is investing massively to ensure its natural gas self sufficiency. On the downstream side this decision will affect the portfolio of the petrochemical derivatives to be produced from this ethane cracker. As part of this modification, Adnoc is also expecting to receive proposition to optimize the capture using Digital twin technologies. This simplification should allow Adnoc to send the invitation to bid (ITB) in May , when the FEED should reach its completion. Then, the tenders should be evaluated on second half of 2020 for a sanction of the EPC contract on 2021. -- January 2020 -- Adnoc selected Axens licenses for the : - 124,000 t/y MTBE unit - 50,000 t/y 1-butene unit - 75,000 t/y plant for the production of high-purity 1-hexene through ethylene trimerization (AlphaHexol) - Methyl acetylene and propadiene hydrogenation unit - C4 hydrogenation plant - Pygas 2-stages hydrogenation unit -- March 2020 -- Maire-Tecnimont is progressing according to plan on the FEED work of the project. It should be completed on end of June. Therefore, Adnoc is is preparing the tenders for the EPC contracts to be issued on Q2 2020, so that the project should be awarded at the end of 2020 or on early 2021. -- July 2020 -- Maire Tecnimont completed the FEED work according to plan so that Borouge and WorleyParsons are now preparing the tender for the EPC contracts. The project should be tendered in four EPC packages including one for the: - 1.5 million t/y ethylene cracker - Polyethylene (PE) - Methyl tertiary butyl ether (MTBE) - Other specialties Borouge has sent the expressions of interests to more than 10 engineering companies for one or more EPC packages. The qualification of the companies to be invited to bid (ITB) should be completed on Q4 2020 so that the EPC contracts could be awarded on second half 2021. -- April 2021 -- Borouge has decided to split the project in five different packages: - $2 billion - Ethylene cracker and main processing facilities - $1.1 billion - Polymers production units - $0.15 billion - Second cross-linkable polyethylene (XLPE-2) unit - $1.5 billion - Utilities & Offsites - $0.1 billion - Site preparation and early work. For the Utilities & Offsites Package, Borouge adopted a conventional business model in tendering the EPC contract between: - China Huanqiu Contracting & Engineering Corporation (CHCEC) from China - GS Engineering & Construction from South Korea - Hyundai engineering & Construction from South Korea - Larsen & Toubro from India - Maire Tecnimont from Italy - Samsung Engineering from South Korea This EPC contract should be awarded at the end of 2022, beginning of 2023. -- November 2021 -- During ADIPEC, Adnoc and Borealis signed the agreement to move forward on the project. The purpose of the project is to provide the chemical project Ta'ziz with the required petrochemical blocks. In addition, Adnoc and Borealis have decided to add a carbon capture unit in order to reduce the carbon dioxide (CO2) emissions by 80%. This CO2 may be recycled in the petrochemical plant or in the Ta'ziz chemical plat or reinjected offshore to boost the oil and gas production. The sanction of the EPC agreement should take place in 2023.

Project Comments	Comment	Date	User Name
	Test	2021/02/12	Jean GUILHEM