



GDF SUEZ BONAPARTE PTY LTD

16 October 2013

Ian Blayney MLA

Chairman

Economics and Industry Standing Committee

Parliament of Western Australia

PERTH, Western Australia, 6000

Inquiry into the Economic Implications of Floating Liquefied Natural Gas Operations

Dear Chairman

Thank you for the invitation to make a submission to your Inquiry into the Economic Implications of Floating Liquefied Natural Gas ("FLNG") Operations.

GDF SUEZ

GDF SUEZ is a Paris-based Group which employs 138,200 people worldwide and achieved revenues of €82 billion in 2012. The Group is listed on the Paris, Brussels and Luxembourg stock exchanges and is represented on many of the main international indices.

The Group has a presence in almost 50 countries, with operations in power, natural gas and energy services.

GDF SUEZ is the largest buyer of natural gas in Europe, has the largest natural gas transport and distribution network in Europe and holds 344 oil and gas exploration and/or production licenses in 16 countries, with 836 million barrels of oil equivalent of proven and probable reserves.

The Group is the biggest importer of Liquefied Natural Gas (LNG) in Europe, operates the third largest LNG supply portfolio in the world and is the second largest operator of LNG terminals in Europe. It also has a fleet of 17 LNG tankers including two re-gasification vessels

GDF SUEZ is an LNG pioneer - the company has 50 years of experience in the LNG business, including LNG technology development, dating back to the experimental LNG carrier "Beauvais" in 1958 and the first LNG shipment from Algeria to France, in 1965.

GDF SUEZ also has a long history of, and focus on, innovation (with 800 researchers and 7 Research & Development centres), and for many years the Group has been working on innovative offshore technologies including shuttle re-gasification vessels, floating storage and re-gasification units and LNG Floating Production Storage and Offtake (FPSO) facilities.

GDF SUEZ has built and operates many large scale industrial projects, such as the Jirau dam in Brazil (total installed capacity of 3,750 MW), many large water treatment plants, oil and gas platforms and thermal power plants.

In Australia, GDF SUEZ is represented by GDF SUEZ Bonaparte (the Operator of Bonaparte LNG) as well as GDF SUEZ Energy Australia (power generation), and with partner companies as Degrémont (in the water sector) and SITA Environmental Solutions (waste management).

GDF SUEZ BONAPARTE PTY LTD

Level 2, 267 St Georges Terrace, Perth WA 6000 Australia

Tel +61 (8) 6160 8400 Fax +61 (8) 6160 8401

ABN: 13 138 853 728 ACN: 138 853 728

www.gdfsuez.com



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Bonaparte LNG

In August 2009, GDF SUEZ entered into a joint venture with Santos to develop three natural gas fields – Petrel, Tern and Frigate – in the Joseph Bonaparte Gulf, 250 kilometres west of Darwin. Two of these fields have been known for more than 40 years – Petrel was discovered in 1969, with Tern in 1971. They are typically described as “stranded” fields – namely, they are known gas discoveries but considered too remote or relatively small to be economic to develop by tie-back to an onshore plant, a conclusion re-affirmed after a Concept Selection study was completed in 2011. The aim of the joint venture – known as Bonaparte LNG – is therefore to develop these stranded fields using FLNG technology.

The project is currently completing a pre-Front End Engineering and Design (pre-FEED) phase, which is primarily aimed at providing an integrated Basis of Design. This phase is expected to conclude by the end of 2013.

Bonaparte LNG is expected to enter Front End Engineering and Design (FEED) next year, with the aim of making a Final Investment Decision (FID) in 2015. Assuming the project reaches FID, first gas is scheduled for 2019. LNG production is expected to be around 2.4 million tonnes per annum (MTPA)

The proposed FLNG production facility will be moored over the Petrel field and will process and store the natural gas before offloading it to an LNG carrier. The facility will be a maximum of 400 metres in length and 70 metres wide, and will be comparable to a large FPSO facility. A more accurate picture of the project will be available after the FEED phase of the project.

FLNG

FLNG offers a number of opportunities in addition to unlocking stranded gas. It is a way of minimising the environmental impact, with no pipeline to shore, no jetty, no onshore storage terminals (as the LNG, condensate and LPG storage requirements are part of the hull); there are fewer execution risks; and there is the potential to re-deploy the facility at the end of a project's life, assuming the field characteristics are similar.

But FLNG is not without its challenges. To begin with, at the time of writing, there is no operating example of FLNG anywhere in the world. However, the technologies involved are not new. They are proven. The innovation comes with putting these technologies in the context of a floating facility.

With many years of studies and experience in LNG, with our own R & D and LNG teams and industrial partners, and through work performed on Bonaparte LNG since 2010, the Group is well progressed towards meeting these challenges. To date, we have found no technological showstoppers to the development of FLNG.

FLNG as the preferred Concept

GDF SUEZ had been looking worldwide for an opportunity to develop a fully integrated FLNG concept, from gas extraction to the sale to market, and Bonaparte LNG provided that opportunity. However, that did not stop the Group from going through a Concept Selection process which tested that the FLNG concept was the most appropriate. During this process, GDF SUEZ analysed four different development concepts or options, specifically:

1. FLNG
2. FLNG with a separate Central Production Facility (CPF).
3. Offshore extraction, new onshore plant
4. Offshore extraction, tie-in to existing offshore pipeline or existing onshore plant

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The following chart shows the assessment of these options against four key criteria – strategy, economic, technological, and environmental.

Option	Assessment against key project drivers				Rank
	Strategy	Economic	Technology	Environmental	
Offshore FLNG facility (base case)	Favourable <i>Allows stand-alone project.</i>	Favourable <i>Lowest development & decommissioning costs.</i>	Favourable <i>Emerging technology that is being advanced globally; technology allows unlocking of 'stranded gas'.</i>	Favourable <i>Smallest footprint; avoids potential impacts of pipeline to shore, and development or tie in to existing processing facility.</i>	1
Offshore CPF and FLNG facility	Favourable <i>Allows stand-alone project.</i>	Favourable <i>Lower development & decommissioning costs than onshore processing or tie-in options.</i>	Favourable <i>Emerging technology that is being advanced globally; technology allows unlocking of 'stranded gas'.</i>	Favourable <i>Comparably larger footprint than FLNG. Avoids potential impacts of pipeline to shore, and development or tie- in to existing processing facility.</i>	2
Offshore extraction/ onshore processing	Favourable <i>Allows stand-alone project.</i>	Unfavourable <i>Development costs considered significantly higher than FLNG.</i>	Favourable <i>Existing technology.</i>	Unfavourable <i>Comparably larger footprint than FLNG due to pipeline to shore and construction of onshore facility.</i>	3
Offshore extraction/ tie in to offshore pipeline or to existing onshore facility	Unfavourable <i>Does not allow stand-alone project.</i>	Neutral to unfavourable <i>Third party agreements have the potential to reduce returns. Offset to CAPEX spend favourable.</i>	Favourable <i>Existing technology.</i>	Neutral to Unfavourable <i>Potential for comparably larger footprint impacts than FLNG due to additional pipeline to tie-in location. Avoids construction of a new onshore processing facility.</i>	4



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Economic Impact

Bonaparte LNG is currently in its pre-FEED stage of development, so an analysis of its economic impact is yet to be completed. However, its economic impact is expected to be significant; from billions of dollars in taxes over the 25 year life of the project, to the many billions of dollars of service and maintenance opportunities run out of Darwin's Marine Supply Base.

Bonaparte LNG is posted on the Industry Capability Network and the project's contracting policy is to provide full, fair and reasonable opportunity to local service providers. Assuming the project proceeds to FID, the floating facility will be constructed in South Korea, one of only a few places in the world with the capacity to construct a facility of this size. However, the drilling of the wells, the installation of the subsea facilities, plus ongoing supply and maintenance, will entail significant onshore support in Darwin involving Australian labour, goods and services.

There will be a workforce of around 200 (with 100 on-board at one time) either living in Darwin or flying in and out through the city.

Pre- FID expenditure

Bonaparte LNG is forecast to spend US\$ 475 million dollars ahead of taking a FID. Of this, between 60 to 70% will be delivered as local content through project management, engineering studies, metocean and geotechnical surveys, validation and assurance services, subsea design, licence fees, appraisal drilling and reservoir modelling.

Post-FID

Engineering and design including Project Management

The Bonaparte LNG project management team is expected to be resident in Perth and will oversee delivery teams in FLNG engineering and construction offices. The subsurface, drilling, subsea and operations readiness functions will also be managed from Australia (GDF SUEZ Bonaparte, the Group's Australian subsidiary and Operator of Bonaparte LNG, has managed the project from an office in Perth since January 2010). Those functions include:

- Project management offices
- Manpower, training and development
- Subsurface reservoir development planning
- Well engineering
- Subsea Engineering
- Third party engineering studies
- Seismic studies
- Surveys (metocean and geotechnical)
- Warranty and inspection services
- Insurances
- Licence fees and duties
- Subsurface modelling

Fabrication and manufacturing

Local fabrication and manufacturing opportunities include:

- Subsea metrology and rigid spool fabrication
- Information technology services to support intelligent operations and maintenance including fibre optic link to the FLNG facility if this option is confirmed.
- Commissioning and operational sparing

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Construction and ancillary services

Local construction and ancillary services opportunities (including offshore installation and commissioning) comprise:

- Drilling and completion of the wells and associated services.
- Subsea installation and riser support system
- Installation of FLNG mooring system
- Hook-up of FLNG vessel to riser.
- Offshore commissioning of FLNG facility
- Logistical support to drilling, subsea and FLNG offshore operations including fixed wing and rotary services, support vessels, customs clearance, freight forwarding, waste management, onshore warehousing, supply of fuels, lubricants and chemicals, telecommunications and onshore fabrication capability.

Operations

The opportunities for local manpower, goods and service providers during the setting-up (pre-operations) of the project and over the 25 year operational life of the project will be worth several billions of dollars. The type of opportunities for local goods and service providers are listed below:

Typical pre-operations contract requirements:

Perth Operations Centre

- Maintenance contractor
- iOps collaborative work environment
- IT infrastructure
- Information management (iEDMS)
- Corporate office
- Waste handling (execute & operate phases)

Darwin Logistics base

- Maintenance contractor
- IT infrastructure
- Waste handling (execute & operate phases)
- Hazardous waste handling (operate phase)
- Warehousing contractor
- Freight forwarding with Customs clearance and Australian Quarantine Services capability

Typical Logistics Service Contracts

- Rotary wing services
- Fixed wing services
- Marine services – ISVs & MFSV
 - Marine operating management services
 - Marine manning services
- Logistics service contract
 - Waste Management Services
 - Supply Base Contract
 - Road Transport Services
- Port Services
 - Berthing services and pilotage.
 - Stevedoring and material handling
 - Crane Services
- Customs clearance
- Freight forwarding
- Travel service

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Typical Operations & Maintenance Contracts

General Maintenance Services	General Inspection Services	OEM Healthcare	Operations Services
Civil	Electric motors	Electric motors	Telecom & IT
Mechanical	Pumps	Pumps	V SAT
Instrumentation	Compressors	Compressors	Information Management
Electrical	Heat Exchangers	Heat Exchangers	LQ & Catering
Rigging	Instrumentation	Instrumentation	Paramedic
Scaffolding	Analysers	Analysers	Laboratory
Industrial cleaning	Valves	Valves	Logistics and Warehouse
Fabric maintenance	HVAC	HVAC	Freight Forwarding
Welding	Gas Turbines	Gas Turbines	Port Operations
Machining	Instrument Air Drier	Instrument Air Drier	Customs & Quarantine
Safety Valves	N2 Generator	N2 Generator	Road Transport
Cranes	Turret	Turret	Rail Transport
	Mooring	Mooring	Aviation - Helicopter
	Hull	Loading Arms	Aviation - Fixed Wing
	LNG Containment system	LNG Containment system	Aviation – Medical evacuation
	Loading Arms	OEM Equipment storage	Emergency Response
	Condensate Hose & Reel	Sub sea	Marine MFSV
	Hawser & Hawser Winch	Cranes	Marine ISV
	Piping	Thrusters	Chemical supplies
	Structure	MAC	Consumables
	Helideck		Waste Management
			Spill Response
			Training
			Training Simulator
			HSSE Equipment
			Corrosion Management
			Classification
			Verification
			Utilities Services
			Security

Taxes and revenue

Bonaparte LNG is currently in its pre-FEED stage of development, so an analysis of its economic impact is yet to be completed but assuming it goes ahead, the project is expected to pay billions of dollars in taxes over its 25 year life.

Conclusion

GDF SUEZ has been at the forefront of the LNG industry for many decades and sees FLNG as a major innovation, unlocking access to natural gas fields long considered 'stranded.' GDF SUEZ analysis shows that there are more than 800 stranded gas fields around the world suitable for annual production of between 2 to 3 MTPA of LNG, and there are 25 FLNG projects currently on the drawing board, 3 of which have taken a FID - they are off Columbia, Malaysia and Australia.

As well as the industry's predilection to innovation, another motivating factor behind the growing interest in FLNG has been cost. Whilst FLNG is by no means a cheap solution, it is not as expensive as recent onshore developments.



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For Australian LNG projects to move from the drawing board to the development phase, they must be cost-competitive. Investors in LNG development now have more options than ever in choosing a destination for their capital, and new Australian projects must be cost competitive if they are going to attract the investment needed to get a project developed. FLNG offers a more-cost effective approach. Without a more cost-effective option like FLNG, there is a risk the resources may stay in the ground.

GDF SUEZ is grateful for the opportunity to develop the long-stranded fields of Petrel and Tern using innovative FLNG technology and thereby helping put Australia at the forefront of the FLNG industry.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'J. Letellier', with a long horizontal stroke extending to the right.

Jean-Francois Letellier
General Manager
GDF SUEZ Bonaparte

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