Abasare Internal Investment Proposal (Pre FID IP)

Summary information

Business unit and company	Shell Petroleum Development Company of Nigeria Limited (SPDC)
Group equity interest	30%, with SPDC as Operator of an incorporated Joint Venture (JV)
Other shareholders/ partners	Nigeria National Petroleum Corporation (NNPC: 55%), Total Exploration & Production Nigeria Limited (TEPNL: 10%), Nigeria Agip Oil Company (NAOC: 5%) in SPDC-JV
Business or Function	Upstream International (UI)
Amount	USD 3.69mln Shell share, MOD, 50/50 (USD 12.31mln 100% JV)
Project	Pre FID for Gbaran Phase 3A Abasare Field Gas Development Project
Main commitments	see table below

Cost	100% SPDC JV (F$mln)	Shell Share (F$mln)
TQ Planning	0.09	0.03
Permits & Licenses	0.15	0.05
Surveys	0.64	0.19
FEED	2.50	0.75
EIA	0.57	0.17
Location & Access Road	7.65	2.29
HSSE & SP	0.65	0.19
Project Assurance	0.08	0.02
TOTAL Pre-FID	12.31	3.69

Reserves/Resources	The Gbaran Phase 3A Abasare Field Gas Development project will develop additional 720Bscf of gas and 19MMstb of condensate contingent resource (2C) from Abasare field via drilling and completion of 6 new NAG development wells. The 1C and 3C volumes are 223.5Bscf & 8.9MMstb and 999.1Bscf & 26.7MMstb respectively.
Production	Incremental gas production from this project peaks at 94MMscf/d in 2021, with associated condensate production reaching circa 4Mstb by 2021. This will support SPDC NLNG gas supply obligation, improve cash flow and keep Gbaran CPF utilized.
Source and form of financing	This pre-FID investment will be funded via JV funding. Shell share expenditure will be met by SPDC's own cash flow. Formal JV Partners' approval will be obtained. All JV partners are fully on board and have participated in all key project activities.
Summary cash flow	Cost Only Evaluation. Cash Flow Plot not Aplicable.
Summary economics	The table below shows the economics for the Pre-FID evaluation.

Summary economics	NPV7% (USD mln)	RTEP (%)	VIR7%
Project title	Gbaran Phase 3A Abasare (Pre-FID)		
Base case	-0.50	NA	NA
High Opex	-0.60	NA	NA
Low Opex	-0.40	NA	NA

Section 1: The proposal (management summary)

This Pre-FID Investment Proposal seeks approval for funding of $3.69mln Shell Share ($12.31mln, MOD, 50/50 100% JV) for the Pre-define phase of the Gbaran Phase 3A Abasare Field Gas Development scope including civil works (sand preloading) to guarantee early gas.

Figure 1 shows NLNG gas supply forecast (OP14 Forecast). The difference between the stacked bars and the solid blue line is 3rd party deferment.

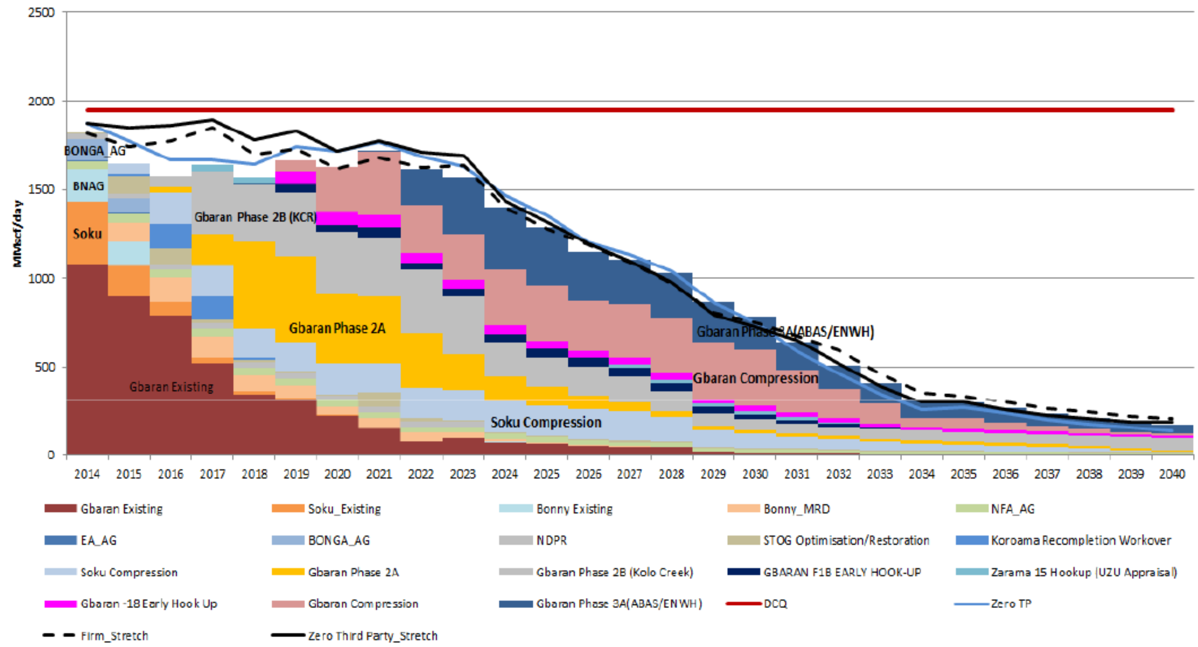

Figure 1: January 2014 MT-IAP NLNG Gas Supply Forecast

Gas supply shortfall can still be observed prior to 2017 comparing the blue line to the daily contractual quantity (DCQ). Beyond 2020, when the Gbaran Phase 1 and 2A fields cannot help meet the DCQ anymore, there is the opportunity to sustain the gas supply through the development of Abasare field as part of the developments in Gbaran node to supply gas to NLNG and keep the CPF fully utilized.

Abasare field is situated in OML 28, some 25km North of Gbaran central processing facility (CPF). The field development is in Trache-1 and 2. Tranche-1 is gas development which is this project (i.e. Gbaran Phase 3A Abasare Field Gas Development) and the focus of this pre-FID IP. Tranche-2 is oil development to be carried out subsequently after appraisal (the appraisal is part of tranche-1 well drilling and carried in tranche-1 project cost). The oil is a tranch-2 development due to its current negative return and security of evacuation.

This is an infill project entailing "NAG wells drilling and tie-back via flowlines/bukline" to Gbaran CPF for processing and export to NLNG via the eastern gas gathering system 2 (EGGS2). Since June 2010, gas from Gbaran CPF is being exported via the 1.4Bscf/d EGGS) and supplies gas to NLNG Trains 1-6, located at Bonny Island. The associated condensate is exported via the Trans Niger Pipeline (TNP) to Bonny. A long term gas sales agreement (GSA) is in place that commits SPDC to supply an average Daily Contractual Quantity of 1,941 MMscf/d to the six NLNG trains.

This proposal for USD12.31mln (MOD) is for the pre-FID works to mature the project definition after DG3, up to VAR-4 and FID. It covers activities described in Table 1 below:

ABASARE EXPENDITURE DESCRIPTION AND PHASING (MOD)									
Description	Proposal (100%)	Shell share (30%)	2015 (100%)	Shell share (30%)	2016 (100%)	Shell share (30%)	2017 (100%)	Shell share (30%)	2018 (100%)
TQ Plan Generation	0.02	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Permits & Licences (Pipeline OPL/PTS/Crossing)	0.15	0.05	0.05	0.02	0.11	0.03	0.00	0.00	0.00
Access Road, Pipeline route and Location Survey	0.64	0.19	0.46	0.14	0.18	0.05	0.00	0.00	0.00
FEED (by SEDO)	2.50	0.75	2.50	0.75	0.00	0.00	0.00	0.00	0.00
Location and Access road/Land Acquisition	2.65	0.80	0.00	0.00	0.83	0.25	1.27	0.38	0.55
Environmental Impact Assessment(EIA)	0.57	0.17	0.00	0.00	0.15	0.05	0.25	0.08	0.17
Location and Access road Preparation	5.00	1.50	0.00	0.00	0.00	0.00	5.00	1.50	0.00
Biodiversity Activities	0.03	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01
Sustainable Community Development (SCD)	0.58	0.17	0.03	0.01	0.02	0.01	0.32	0.10	0.22
HSSE (HAZOP, etc)	0.04	0.01	0.00	0.00	0.04	0.01	0.00	0.00	0.00
TQ Project Delivery (IPA PRO)	0.07	0.02	0.00	0.00	0.07	0.02	0.00	0.00	0.00
ESAR/VAR-4	0.08	0.02	0.00	0.00	0.08	0.02	0.00	0.00	0.00
TOTAL	12.31	3.69	3.05	0.92	1.48	0.44	6.84	2.05	0.95

Table 1: Expenditure Description and Phasing (MOD)

The Table 1 shows 4 key activitie (see in red colour) account for ca. 90% of pre-FID commitments i.e. FEED, land acquisition, sand preloading and sustainable community development (SCD).

Business Objectives Full Project

The business objective of this project is to develop additional 720Bscf of gas and 19MMstb of condensate contingent resource (2C) from Abasare field to support gas supply to NLNG T1-6 and keep Gbaran CPF utilized. The main business drivers for the project include:

- Meet NLNG Gas Supply obligation- sustaining the planned DCQ as long as possible.
- Increased Production/Reserves- bringing the ultimate recovery of the reservoirs in the node to the Top Quartile bracket.
- Reduced CAPEX- achieving low unit development cost to align with Partners aspiration and facilitate funding.
- Reduced Opex- achieving low unit operating cost by utilizing remote operations capability to cut down on operators intervention and exposure considering remoteness of Abasare field from Gbaran CPF.

Project Scope

Abasare gas development is an infill project with processing and export at Gbaran CPF (see Figure 2 for the development concept schematic). The following is the project scope:

- Drill and complete 5 wells from 2 wellhead cluster locations
- Construct 5 x 8-inch duplex steel flowlines of 1-2km lengths (total length 7km)
- Install a remote manifold with multi-phase metering and chemical injection skid
- Construct 16-inch duplex steel 13.53km tie-back bulkline to Gbaran CPF via existing Zarama 20-inch duplex steel 10.2km bulkline

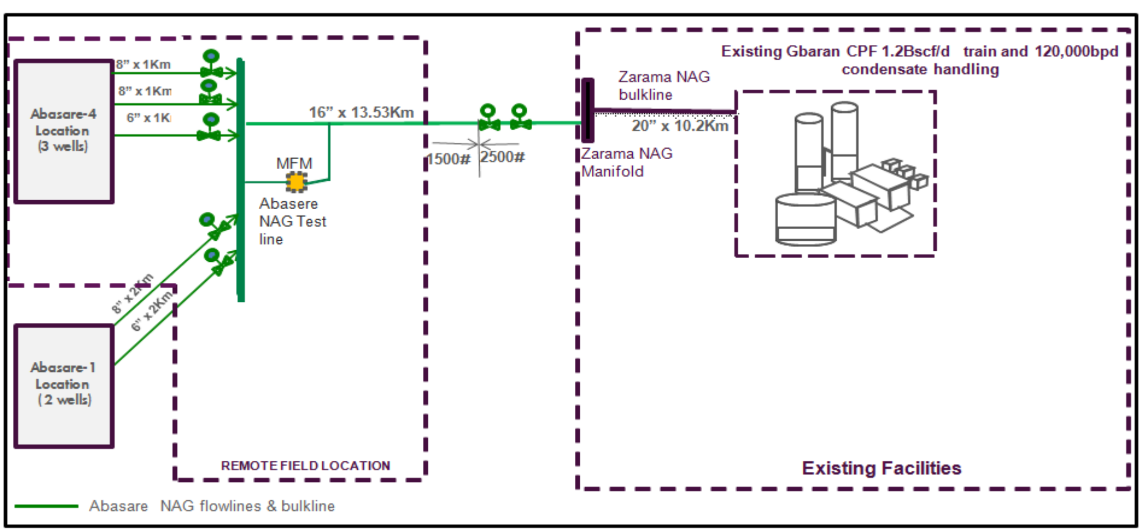

Figure 2: Gbaran Phase 3A Abasare Field Gas Development Schematic

Funding

This project is carried in OP14 as future Alternative Funding (AF). Project team has proposed NLNG Corporate balance sheet funding and the plan in the current funding roadmap is Funding agreement sign-off in October 2017. It is expected that the project FID Opex and Project Management costs will continue to be funded via JV budgeting process. The estimated total CAPEX for the project is approximately $626.68mln (MOD) 100% JV, excluding Pre-FID cost of $12.32mln (MOD) 100% JV. Table 2 shows the full project phasing.

	Abasare Cost $ Million									
	Pre-FID OPEX			Post FID CAPEX						
Scope	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Pre-FID	3.05	1.48	7.79							12.3
Detailed Engineering				20.3	6.8					27
Project Management					9.4	10.3	10.3	0.9		30.8
Fabrication					78.3	85.5	85.5	7.1		256.4
Transport/Install					1.3					1.3
Hook-up/Commission								1.0	0.5	1.4
Other Project Cost*				26.5	132.4					158.9
Well Cost							118.2	32.6		150.8
Total	3.05	1.48	7.79	46.76	228.23	95.71	213.88	41.58	0.48	639

Table 2: Full Project COST phasing

*** Procurement of equipment, CS pipes, structural material, electrical & instrumentation**

Section 2: Value Proposition and financial context

The primary objective of the Gbaran phase 3 Abasare gas project is to supply NLNG T1-T6 to help meet SPDC contractual obligation of ca. 2Bscf/d. In doing so, the project will develop additional 720Bscf of gas and 19MMstb of condensate contingent resource (2C).

Summary Economics

The Pre-FID economics for the Gbaran Phase3 Abasare Project was evaluated as a cost only with the 50/50 level II cost of $3.69 mln ($12.32mln JV 100%) treated as Opex. It is expected that the full project IP would be evaluated as CAPEX investment (including the Pre-FID elements) when the Project is taking Final Investment Decision (FID).

Sensitivities-
Pre-FID:

- Low and High Opex.
- 1 Year cost delay.
- 1.5% cost mark-up due BVA as a result of NAPIMs cost dispute.
- Pre-FID cost estimates treated as CAPEX with funding assumed to be based on 2008 MCA (Modified Carried Arrangement).

Full Project Scope:

Additional sensitivity was carried out on the Full Project Scope using Production Forecast and the 50/50 level II cost estimates in the absence of level III estimates. It is noteworthy to mention that, the project under JV terms returned and positive NPV7% and a VIR7 of 0.58. But in view of the foregoing that, the project is assumed to be funded under Alternative Funding mechanism, the base and sensitivities for the Full scope were evaluated under the 2008 MCA (Modified Carried Arrangement). The detailed results are shown in Table 3.

- High Reserves (P10)
- Low Reserves (P90)
- High Opex (+25%)
- Low Opex (-15%)
- License Expiry 2019
- License Expiry 2039
- High Capex (+25%)
- Low Capex (-15%)
- 1 Year Project delay
- JV Results
- Base + Midstream Value
- Base + Midstream + Trading Value

From the economics results below the Pre-FID shows the maximum exposure for carrying out the expenditure, thus the full value of the project will be realised after taking Final Investment Decision (FID).

PV Reference Date: 1/7/2014	NPV (S/S $ mln)		VIR	RTEP	VTE	UTC (RT $/boe)		Payout-Time (RT)	Maximum Exposure (RT- AT)
Cash flow forward from: 1/1/2014	0%	7%	7%	%		0%	7%	(yyyy)	mln (yyyy)
Base Case									
RV ($90/bbl RT14)*	-0.55	**-0.50**	**NA**	NA	NA	NA	NA	NA	*$0.55 (2016)*
Sensitivities (using RV-RT14)									
High OPEX (P90)		**-0.6**	**NA**						*$0.57 (2016)*
Low OPEX (P10)		**-0.4**	**NA**						*$0.49 (2016)*
1 Year Cost delay		**-0.5**	**NA**						*$0.53 (2017)*
1.5% cost markup due to BVA issues		**-0.7**	**NA**						
Pre-FID Cost treated as Capex (MCA)		**-1.5**	**-0.21**						*$2.23 (2016)*

* Same result applies to SV-RT and HV-RT since there is no revenue stream.

Table 1: Pre-FID Economic Grid (Shell Share)

Parameter	Unit	LTA 2 Provision	Low	Mid	High	Comments
Capex (MOD)	US$ mln	NA	NA	NA	NA	
Opex (MOD)_Project	US$ mln	3.7	3.1	3.7	4.6	Pre-FID costs treated as Opex
Production Volume	mln boe	NA	NA	NA	NA	
Onstream Date	mm/yy	NA	NA	NA	NA	

Table 2: Pre-FID Key Project Parameters Data Ranges (Shell Share)

PV Reference Date: 1/7/2014	NPV (S/S $ mln)		VIR	RTEP	VTE	UTC (RT $/boe)		Payout-Time (RT)	Maximum Exposure (RT- AT)
Cash flow forward from: 1/1/2014	**0%**	**7%**	**7%**	**%**		**0%**	**7%**	**(yyyy)**	**mln (yyyy)**
Base Case									
SV ($70/bbl RT14)	260.2	**46.5**	**0.18**						
RV ($90/bbl RT14)	344.9	**70.2**	**0.28**	18.1	NA	5.3	11.2	2021	*$ 112.1 (2020)*
HV ($110/bbl RT14)	417.8	**92.9**	**0.37**						
Sensitivities (using RV-RT14)									
High Reserves		**123.5**	**0.49**					2021	*$114.8 (2020)*
Low Reserves		**32.3**	**0.13**					2021	*$110.4 (2020)*
High Opex (+25%)		**68.7**	**0.27**					2021	*$112.7 (2020)*
Low Opex (-15%)		**71.0**	**0.28**					2021	*$111.7 (2020)*
License Expiry 2019		**-57.1**	**-0.27**						*$82.6 (2019)*
Lincense Expiry 2039		**57.0**	**0.23**					2021	*$112.1 (2020)*
High Capex (+25%)		**58.4**	**0.19**					2022	*$140.3 (2020)*
Low Capex (-15%)		**75.1**	**0.35**					2021	*$91.1 (2020)*
1 Year delay		**65.5**	**0.28**					2022	*$112.1 (2021)*
JV Results		**72.3**	**0.58**					2021	*$112.1 (2021)*
Base + Midstream Value		**107.7**	**0.43**						
Base + Midstream + Trading Value		**109.6**	**0.43**						

Table 3: Full Scope Economic Grid (Shell Share)

Parameter	Unit	LTA 2 Provision	Low	Mid	High	Comments
Capex (MOD)	US$ mln	191.7	162.9	191.7	239.6	Full Project Capex
Opex (MOD)_Project	US$ mln	4.8	4.1	4.8	6.0	SCD Opex
Production Volume	mln boe	42.4	39.5	42.4	63.6	
On-stream Date	mm/yy	Dec-20	Aug-20	Dec-20	May-21	

Table 4: Full Scope Key Project Parameters Data Ranges (Shell Share)

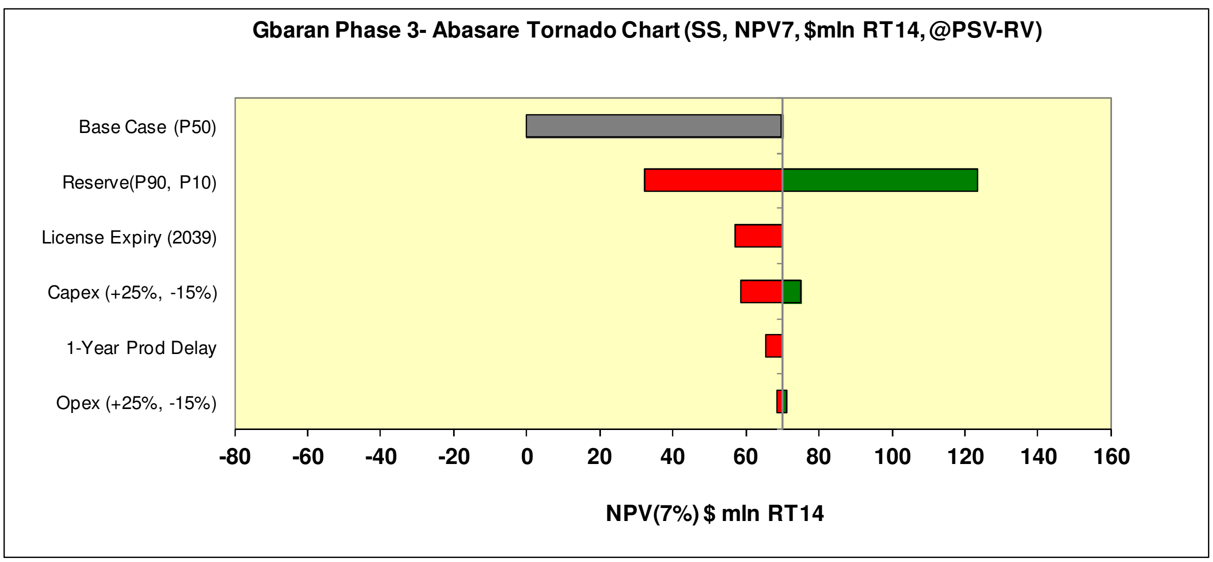

Chart 1: Full Scope Tornado Chart (Shell Share)

Economics Assumptions

Pre-FID Evaluation (Base)

- Pre-FID 50/50 cost estimates treated as OPEX.
- NDDC levy 3% of total expenditure.
- Social Performance Opex of 2.5% of MOD CAPEX used for Capex Sensitivity.

Full Scope Project (Sensitivity)

- Oil PSVs of $70/bbl @SV-RT14, $90/bbl @RV-RT14 (Base) and $110/bbl @HV-RT14 with Bonny offset applied.
- 2014 NLNG Contracted Price RT14 was used.

- GHV of 1150 BTU/Scf used.
- Oil was taxed under PPT (PPT tax rate of 85%).
- Gas was taxed under CITA with AGFA incentives.
- Social Performance Opex of 2.5% of MOD CAPEX.
- NDDC levy of 3% total expenditure.
- Education tax of 2% assessable profit.
- Gas flare penalty of $3.5 /Mscf was applied and is not tax deductible.
- Abandonment cost is estimated at 10% of total project RT CAPEX.

MCA Assumptions (likely funding mechanism now NLNG Corporate balance sheet):

- Profit ceiling of 8% IRR on carried costs.
- Current agreement for recovery of carry costs is maintained.
- OPEX and PMT not carried under current MCA arrangement.
- All costs on the MCA would be recovered through cost oil.

Midstream Assumptions:

- The midstream value estimated based on the gas volume advised.
- Analysis extended beyond 2029 (the limit of current GSA factored into 2013 LTA2) up to 2045.
- 2013 LTA2 assumptions in NLNG model used to generate margin applied to the projects' gas volumes.
- NLNG gas price is indexed to Brent price for LNG supply to Europe and Asian markets and to HH for US market.
- 2014 PSVs - of $70/$3 @SV-RT14; $90/$4 @RV-RT14 and $110/$5@HV-RT14 applied as Brent/HH.

Section 3: Risks, opportunities and alternatives

Risks workshops and focused non-technical risk workshops have been carried out in the course of the opportunity maturation. Identified Risks and Opportunities are assigned Owners, evaluated and responses have been planned to mitigate the likelihood of occurrence.

<u>Political</u>

Regulatory (DPR) and Partners approval of the development concept is required via the approval of the field development plan. DPR and NAPIMS have been engaged on the gas first development concept and have expressed their support. This reduces the risk of approval of the FDP by these two organizations when it is presented. The Petroleum Industry Bill (PIB) outcome remains very uncertain. The value of SPDC gas projects may be severely impacted due to change in the gas fiscal terms. PIB sensitivity carried out as a mitigation shows potential erosion of the project value.

<u>Organizational</u>

Project resourcing to move into Define Phase is in place and a part of the NLNG gas supply portfolio organization. Many of the staff are shared with Gbaran phase 2A and 2B projects and may result in delays due to availability of these engineers for Gbaran phase 3A project. Mitigation is the development of a manpower histogram to provide foresight of pinch points where shared resources are tight. Gbaran phase 2A & B projects in execution present opportunities for replication and lessons learnt.

<u>Commercial</u>

Abasare field is in OML 28 amongst the SPDC onshore OMLs that will expire in 2019. SPDC has plan in place to commence negotiation the penultimate year to expiration (2018) as required by regulation. The funding for Abasare development is not yet approved. MCA funding has been assumed as a mitigation considering the fact that Gbaran phase 1 and 2 are MCA funded. The likely funding mechanism now is the NLNG balance sheet. Abasare field is a land location and part of the Eastern asset. It is currently uncertain if the OMLs that it seats are one of the OMLs that will be divested in the Land Eastern operation of SPDC.

Economic

The proposed project funding for Abasare gas development was initially MCA, following from the funding mechanism for Gbaran phase1 and 2. This indicates erosion in VIR7% to below the 0.4 hurdle (Abasare 0.28) with NPV7% remaining stable relative to JV funded. Value chain economics with associated mid-stream value shows VIR above the hurdle (0.43). The most likely funding mechanism now is the NLNG Corporate balance sheet.

Technical

Abasare field has low well density especially in the Eastern accumulation and there is no gas PVT taken in the field. As a mitigation local PVT correlation has been used as analogue and a range of Low and High case realization have been built for which the development concept is robust. Further appraisal will only narrow the range and not a change in the development concept.

Abasare is 25km from Gbaran CPF and poses free flow assurance risks. The Abasare flow has been modelled with other production to the Gbaran CPF using the Gbaran node integrated production system model. The outcome of the IPSM modelling was further calibrated with detailed flow assurance and hydraulics work signed off by the relevant technical authorities.

Because Abasare is an infill project, there is the risk of brown field integration (obsolescence, standards, SIMPOS, etc). These have been taken into cognizance in the design class and execution planning.

Section 4: Carbon management

A greenhouse gas and energy management plan has been developed for the project. The total direct GHG emission is circa 102ktpa at plant peak. This is less than the 500 ktpa threshold that qualifies a project as ‘carbon critical’. The main drivers for GHG emissions from major plant processes are fugitive with a total of 55.5ktpa contributing about 54% and combustion with total of 46ktpa contributing about 45% at plant peak year. The primary energy source is natural gas and energy consumption is principally by the gas turbine driven equipment – electrical power generators. Though the project is not a carbon critical, adequate focus will be given to the implementation of the recommendation of the GHG and energy efficiency study and continued engineering management to ensure emissions is reduced to ALARP. Some of the opportunities to reduce emissions in the facility include the use of existing facilities for processing and application of flaring philosophy.

Section 5: Corporate structure, and governance

This project fits within the existing SPDC corporate structure and governance. Consequently, it will comply and respect all relevant and existing project governance.

Section 6: Functional Support and consistency with Group and Business Standards

This proposal complies with Group Business Principles, policies and standards. Full functional support covering SCD is provided for in the pre-FID (see Table 5) and full project scope. In addition, there will be a focus on Nigerian Content Development (NCD) as already indicated above. Relevant Functions have provided functional support for this Investment Proposal.

Section 7: Project management, monitoring and review

The Major Projects Team – NLNG Supplies Projects under PTP/O/NN is managing the project. The ORP compliant governance structure is in place, including a project specific DRB, DE and BOM. A Project Control and Assurance Plan (PCAP) is under development to define the applicable controls for DEFINE phase.

Section 8: Budget provision

The project is in the AF category in BP13. F$?mln 100% JV is carried in 2014 Budget book. The project budget commitment for 2014 is **$3.05mln**.

Section 9: Group financial reporting impact

There are no unusual accounting issues related to this GIP. Expenditure related to the project will be accounted for in line with Group Policy. The financial impact of this proposal on Shell Group Financials is as indicated in the table 5 below:

USD Million	2014	2015	2016	2017	Post 2017
Total Commitment	**0.91**	**0.45**	**2.34**		
Cash Flow					
SCD Expenditure	0.01	0.01	0.15		
Pre-FID Expenditure	0.90	0.44	2.19		
Capital Expenditure					
Operating Expenditure	0.03	0.01	0.07		
Cash flow From Operations	-0.14	-0.07	-0.35		
Cash Surplus/(Deficit)	-0.14	-0.07	-0.35		
Profit and Loss					
NIBIAT +/-	-0.14	-0.07	-0.35		
Balance Sheet					
Avg Capital Employed					

Table 5: Gbaran Phase 3A Abasare Gas Development Project Group Financial Reporting Impact

Section 10: Disclosure

Material disclosures, if any, will be done in line with Group and SPDC Disclosure policies/guidelines.

Section 11: Financing

This investment is expected to be financed through the JV base whereas the post FID IP will be financed by an alternative funding arrangement (most likely NLNG Corporate balance sheet) which is currently undergoing discussion and Shell Share of capital expenditure will be met by SPDC's own cash flow.

Section 12: Taxation

There are no unusual taxation features at this stage.

Section 13: Key Parameters

The following is the main aspect of this proposal:
Approval for funding of $3.69mln Shell Share ($12.31mln, MOD, 50/50 100% JV) pre-FID funding for the define phase.

Section 14: Signatures

This Proposal is submitted to UIO/G for approval.

Supported by:

....
Guy Janssens, SEPA-FUI/F
FM Nigeria & Gabon
Date.... /.... /...

For Business Approval:

....
Markus Droll, SEPA-UIO/G
VP Nigeria & Gabon
Date.... /.... /....

Initiator: Esben Johnsen, -SPDC-UIO/G/DS (BOM)

Appendix:

1) Estimate Fact Sheet – Approved cost and schedule estimate as per IDM chapter 4
2) Lifecycle HCM forecast Sheet – Approved HCM Forecast as per IDM chapter 4