

The Shell Petroleum Development Company of Nigeria Limited

Internal Investment Proposal

Summary Information

Directorate	Technical Directorate			
Group equity interest	100% in SPDC, whereas SPDC is the Joint Venture (JV) operator of an unincorporated JV with a 30% interest.			
Other shareholders / partners	Nigerian National Petroleum Corporation -NNPC (55%), Total FinaElf (10%), and Nigerian Agip Oil Company –NAOC- (5%)			
Amount	The headline size of US\$23.4mln OPEX Shell share (MOD, 50/50) is being requested for approval in this IP of which the sum of US\$2.2mln OPEX Shell share (MOD, 50/50) was previously approved at Pre-FID IP stage			
Project	Nembe Electric Power Interdependency Project FID IP			
Main commitments		(US\$Mln 50/50 MOD)		
	DESCRIPTION	Shell Share		
		Pre-FID	New request	Total OPEX JV
	Site Preparation Works (RoW & Geotechnical, sand filling, shore protection, ramp and Jetty)	1.3	2.0	3.3 10.8
	FEED	0.4	0.0	0.4 1.3
	EPICOM for Power Plant facility (GHF, Gas generators, switchgears, transmission lines, switch room, foundations etc)	0.0	14.4	14.4 47.9
	Procurement and construction of gas line pipes	0.5	1.1	1.6 5.3
	Town Distribution Network upgrade at Ogbolomabri and Bassambri	0.0	0.4	0.4 1.4
	Platform extension and tie-in works	0.0	0.3	0.3 1.0
	Project management	0.0	2.2	2.2 7.5
	Contingency	0.0	0.8	0.8 2.7
	Total	2.2	21.2	23.4 77.9
Source and form of financing	This investment will be financed with JV funding and Shell share Opex expenditure will be met by SPDC's own cash flow. Formal JV partners' approval will therefore be obtained.			
Summary cash flow	Cost only Project. Cash flow chart not applicable.			
Summary economics				
	Summary economics	NPV7% (USD mln)	RTEP (%)	VIR7%
	Base case	-2.9	NA	NA

Section 1: The proposal (management summary)

This proposal seeks FID approval of US\$23.4 mln (Shell Share), 50/50 MOD for the Nembe Electric Power Interdependency Project. The sum of US\$2.2mln Shell share (MOD, 50/50) has already been approved for updated Pre-FID works in January 2011. See link [Approved updated pre-FID IP](#)

Currently, the Nembe Creek district is the largest district in the Eastern swamp and consists of the Nembe-1 to 4 and Odeama Creek flowstations. Nembe Creek is the single largest producing field in SPDC East. Premised on BP10, the Nembe 1, 2, 3 and 4 flowstations are planned to export an average of 88Mbopd to Bonny Terminal and 40MMscf/d to NLNG. The Nembe fields had undeveloped oil reserves of 724MMstb and undeveloped gas reserves of 1318Bscf (NNS reserves).

Secondly, SPDC has a total of 4nos. diesel power generating sets (2nos. -1000kVA and 2nos. – 800kVA) installed at Ogbolomabiri and Bassambiri. The monthly diesel requirement for the generator sets in each Community is 240,000 litres. This implies that total annual diesel consumption for the two communities is 2.88mln litres on a 12hrs utilization basis. SPDC incurs an annual diesel procurement cost of approximately \$3.64mln to ensure continued operation of the diesel generator sets. Also, with the impending de-regulation of petroleum products market, this figure could be higher. Previous instances when SPDC has defaulted in the supply of diesel for the generating sets have resulted in various threats from the communities.

A comparison between ‘Do Nothing’ that is, continue with supply of diesel to Communities for fuelling diesel generators and deploying this Project - utilizing gas engines was made using the economics tool and outcome is as seen in appendix I

In addition, SPDC management made commitment to the Nembe Communities to execute this Project in response to the Nembe City Community request and agitation during the construction of NCTL while Community threatened to disrupt activities.

The Nembe (Ogbolomabiri and Bassambiri) Electrical Interdependency Project is premised on the deployment of gas-driven power generator that will eliminate the need for the diesel generators currently installed in Ogbolomabiri and Bassambiri. The base case option is to lay about 13.7km gas line from SPDC Nembe 4 gas manifold to the Power Plant, which will be located at the outskirts of Nembe Ogbolomabiri and Bassambiri Communities. Power generated from this Plant will be transmitted to Ogbolomabiri and Bassambiri communities, via a combination of overhead and underground cables and tie-in to the existing transmission/distribution network which would have been upgraded to receive the incoming supply. This is in line with the Nigerian Federal government aspiration of improving power generation.

The scope of work includes:

- ❖ Preliminary works, which includes route and geotechnical Surveys, land acquisition and site preparation (sand filling)
- ❖ FEED and Detailed Design for Manifold tie-in, gas lines, Power plant, transmission and Town Distribution Network works
- ❖ Power generation works, which covers the procurement, installation and commissioning of 3nos. 2.68MW Gas generators and ancillaries, 1no 100kVA diesel generator for start up, 11kV switchgear, auxiliary Transformer, gas handling facilities, Electric pylons.

- ❖ Construction of generator house, switchgear, control and utility buildings, jetty, ramp, access roads and walkways
- ❖ Procurement, coating, construction, installation and commissioning of the gas line, including securing and clearing of the gas line right-of-way
- ❖ Piled extension at the manifold for tie in of the 6" gas line and procurement.
- ❖ Procurement and construction of jetty, Ramp and shore protection.
- ❖ Upgrading of Ogbolomabiri and Bassambiri Town Distribution Network
- ❖ Construction of the River crossing Electric towers and installation and commissioning of transmission lines.
- ❖ Setting up of the Community Utility Company

From the pre-FID scope/budget, the following has been completed:

- ❖ Route and geotechnical survey
- ❖ Land acquisition.
- ❖ Sand filling of Power plant location
- ❖ FEED for manifold tie-in, gaslines, power plant and transmission lines
- ❖ EIA approval
- ❖ PTS application

The total Project cost estimate is US\$23.4mln (Shell share) MOD, 50/50 (US\$77.9mln 100% JV) which includes US\$2.2mln (Shell share) MOD, 50/50 (US\$7.3 100% JV) approved under pre-FID investment proposal.

The total Project works comprises of (US\$5.3 100%JV) for pipeline procurement and installations (US\$47.9 100%JV) for power plant and transmission line construction inclusive of 2years operation and maintenance, (US\$1.4 100%JV) for upgrade of Town distribution networks and (US\$12.4 100%JV) for site preparation (RoW & Geotechnical, sand filling, construction of shore protection, ramp and Jetty). The EPICOM contract work scope for facility has been tendered and outcome of negotiation approved by MTB. Interim contract has been approved for the EPICOM contract pending NAPIMS approval.

The cost phasing 100% JV, for the full project is detailed below:

Table 2: Project Cost Phasing US\$ Mln (100% JV, MOD)

		Prior	2009	2010	2011	2012	2013	2014	2015	Total
OPEX \$mln (100%)	Pre-FID			1.9	3.75	1.66				7.31
OPEX \$mln (100%)	Post FID	0			0.00	28.34	38.32	2.15	1.81	70.62
	Total	0	0	1.9	3.75	30	38.32	2.15	1.81	77.93

Section 2: Value proposition and strategic and financial context

This proposal is consistent with the strategy and objectives of SPDC, which is to reduce deferment due to the 3rd party shutdown, by creating an interdependent “umbilical” relationship between the Nembe flowstations and the main Host communities. The project is consistent with the SPDC Business Plan. A Step-out approval from SPDC Community Electrical Interdependency Policy has been obtained to progress this project. This is necessary because the policy states that ‘SPDC will supply gas at a tariff to state agencies (or other competent stakeholders) to generate, transmit and distribute Power safely for the benefit of Critical Host Communities’. The project will add value to the business in form of reduction in the disruption

of production at Nembe-1, 2, 3 and 4 facilities. Additionally, the project will result in a reduction in OPEX, premised on eliminating the need for diesel utilisation by community generators. The project also seeks to implement alternative cleaner fuel options within the Nembe communities, thus creating a cleaner environment from reduced carbon emissions. The intervention will constitute a fuel switching CDM project with a preliminary estimate of 160,000 tonnes of CO₂ emissions over the project crediting period.

Summary Economics

The base economics for this IP was evaluated on a forward-look and cost only basis using 50/50 MOD (level III) cost estimates.

The ‘*opportunity*’ value of the gas (1.6MMscf/d) that will be utilized by the electrical interdependency project was treated as a cost to the project at NLNG T1-6 price, while the savings on diesel (\$3.9mln/annum) was credited to the project.

Sensitivities analysis carried out include high cost, 1.5% project cost mark-up due to costs dispute with the NNPC as well as the full life cycle economics which include the already approved pre-FID cost.

The value effect of the Petroleum Industry Bill (PIB) was also modelled.

The sensitivity that includes production acceleration benefit was done using the incremental (acceleration) production forecast gained from improvements in 3rd party deferment on BP11 corporate production forecast for the Nembe Node.

The incremental value of the acceleration sensitivity was evaluated to show the impact of the deferment on the project as the difference between the:

1. NFA production forecast with the power project (improvement in 3rd party deferment and the opportunity of the fuel gas)
2. NFA production forecast without the power project (without improvement in 3rd party deferment).

Additional details are in the table 3 below:

Table 3: Economics Grid – Nembe Electric Interdependency Project FID IP (Shell Share, RT12)

PV Reference Date: 1/7/2012	NPV (\$/S \$ mln)		VIR	RTEP	UTC (RT \$/boe)		Payout-Time (RT_yyyy)	Maximum Exposure \$mln RT (yyyy)
Cash flow forward from: 1/1/2012	0%	7%	7%	%	0%	7%		AT
Base Case*								
RV (\$70/bbl RT11)	-3.0	-2.9	NA	NA	NA	NA	NA	3.2 (2015)
BEP (RT \$/Mscf)								
Sensitivities (using RV-RT)								
High Opex (+15%)		-3.6	NA				NA	4.0 (2015)
1.5% Cost markup due to BVA Issues		-3.9	NA					
Ring-Fenced Project		-19.6	NA					
Life Cycle Economics		-3.3	NA				NA	3.5 (2015)
PIB (House v12)		-4.7	NA					
Nembe Power with Production acceleration benefit**		-1.3	NA					
NFA with Nembe Power Project		183.8	NA				NA	NA
NFA without Nembe Power Project***		185.1	NA				NA	NA

* Base case is cost-only with OPEX savings

** This represents the difference in value between NFA with Power Project and NFA without Power Project. The cost of the power provision outweighs the benefit of the reduction in deferment

*** Nembe NFA value at risk

Key Project Parameter Data (Shell Share)

Parameter	Unit	BP11	Low	Mid	High	Comments
CAPEX (MOD)	US\$ mln	20.2	NA	NA	NA	Not used for the evaluation
OPEX (MOD)	US\$ mln	NA	NA	23.4	26.9	
Production Volume	mln boe	NA	NA	NA	NA	Cost-only evaluation
Start Up Date	mm-yy			Jul-13	NA	Expected First Power Date
Production in the first 12 months	mln boe	NA	NA	NA	NA	Cost-only evaluation

Economics Assumptions

- Oil PSV includes Bonny price offset
- Gas sold to NLNG T1-6 @ NLNG T1-6 contract price
- Oil taxable under PPT
- Gas taxed under CITA with Associated Gas Framework Agreement (AGFA) incentive
- ABC OPEX provided by the project team was used for the new gas-powered generators
- 31/12/2010 ARPR (Annual Review of Petroleum Resources) OPEX for Nembe 1-4 flow stations and
- NDDC levy of 3% total expenditure.
- Education tax of 2% assessable profit.
- GHV of 1150btu/scf
- Life span of 25 years assumed for the new gas-powered generators

PIB assumptions:

- NHT depreciation schedule is 4x20%, 19% for qualifying expenditure.
- CIT depreciation schedule is 3x25%, 24%, for qualifying expenditure.
- NDDC levy calculated as 3% of expenditure
- 20% of overseas cost treated as non-deductible for determination of NHT taxable income
- CIT is 30% of taxable income and is not deductible from NHT

Section 3: Risks, opportunities and alternatives

S/No.	Risk	Risk Description	Mitigation /Remedial Effort
1	Commercial / Cost	Reduced Budget funding caused by inadequate funding from the JV	Project is in SPDC Base Plan under SODA team. If there is reduction in budget from the JV, additional fund required will be sought during BCC alignment.
		Financial incapability of the Contractor	Ensure proper milestone payment breakdown that will align with the Project Execution plan thereby providing for adequate remuneration of actual work down by the

			Contractor
2	Technical	Poor interface management between activity executors	All required interfaces based on the contracting strategy and Execution plan will be identified and collated in the interface plan to ensure proper implementation
		Inability to run the O & M contract and eventually exit from Operations / Improper Operation and Maintenance of the Plant after handing over to Community person	The Community Utility Committee will be integrated from the construction stage to ensure exit from the O & M contract and also there will be provision in the O & M contract to extend the contract for another 1 year
3	Schedule	Late Delivery of Equipment	Ensure that FEED deliverables are adequate to place order for LL items and that EPC Contract is awarded on time so that LLIs are ordered has scheduled
4	Stakeholder	Potential conflict between the two Host Communities over location of Power Plant and work sharing	The two Host Communities have been engaged and continuous engagement is planned throughout the life of the Project. Sharing formula for available work allocation will be agreed up front amongst the two Host Communities and Government and this shall apply to works that are common to the two Communities
5	Health, Safety, Security and Environment	HSE Hazards during mobilization and construction	Specific Project HSE Management Plan will be developed in line with SPDC's HSE Contractor HSE Management (EP2005-0110-ST) Also lessons learnt from recent Projects will be applied in managing HSE risk to ALARP.
		Renewed armed struggle in the Niger Delta/ Security of life and Asset of Company/ Contractor	Project security plan will be developed in line with SPDC security policy and Project will strictly adhere to SODA team security arrangements and journey management

Opportunity

There is opportunity to develop the socio-economic life of the people in the Communities in small scale businesses with the supply of constant electric power

Alternatives Considered

- ❖ **Option 2A:** Gas Engines located adjacent to Nembe-4 manifold and overhead lines used for transmitting power to Nembe-Ogbolomabiri and Bassambiri.

- ❖ **Option 2B:** Gas Turbines located adjacent to Nembe-4 manifold and overhead lines used for transmitting power to Nembe-Ogbolomabiri and Bassambiri.
- ❖ **Option 3A:** Gas Engines located adjacent to Nembe-4 manifold and sub-marine cable used for transmitting power to Nembe-Ogbolomabiri and Bassambiri.
- ❖ **Option 3B:** Gas Turbines located adjacent to Nembe-4 manifold and sub-marine cable used for transmitting power to Nembe-Ogbolomabiri and Bassambiri.
- ❖ The selected concept is option 1A - Utilizing Gas Engines located at the outskirts of Nembe-Ogbolomabiri and Bassambiri and gas line from Nembe-4 manifold. The table below shows how these alternate options compare with option 1A. Further details can be found in the concept selection report.

	C: De ability	F: Health, Safety and People Impact	D: Schedule - ETT	G: Operability/ Maintainabili ty	A: Capex	B: Opex	H: Level of Interdepend ency	E: Scalability	
Weights	18%	31%	21%	12%	6%	4%	4%	3%	
Development Concepts									Weighte d Score (%)
OPTION 1A	9	10	8	9	8	8	10	8	89.2
OPTION 2A	5	10	5	5	5	5	10	5	67.0
OPTION 2B	4	10	4	4	5	2	10	4	60.4
OPTION 3A	2	10	3	3	2	5	10	5	53.2
OPTION 3B	1	10	2	2	2	2	10	4	46.6

Section 4: Corporate structure, and governance

The existing corporate structure and arrangement of SPDC-JV with SPDC as operator will be used. A Decision Review Board approved for the SPDC Electrical Interdependency Project will govern the project. The Opportunity Realisation Process will be implemented for the project.

Section 5: Functional Support and consistency with Group and Business Standards

This proposal complies with the Group Business principles, policies and standards. In order to progress the project through the ORP process relevant functional input and support will be sought to ensure seamless execution, this includes discipline teams, SCM, Finance, Social performance and Community Affairs, HSE, Legal, and Treasury.

Section 6: Project management, monitoring and review

The Nembe Electrical Interdependence team, from SPDC Major Projects has been mobilised for project execution. The Project Manager is on seat and has assumed full responsibility for this project after DRB-2/3. The project team has been constituted and resources is from the SODA/Domgas team which will include a project service group consisting of Contracting and Procurement (SCM), discipline team, HSE, Accounting, Information Management, Cost, Planning and QA/QC.

Section 7: Budget provision

The 2012 approved budget for the project of \$30 million (\$9 million, Shell share). This 2012 budget was recommended by JV Partners under the Domgas/IPP tranche on the basis that it is captured as 100% Capex. This categorisation will be maintained in the JV programme budgets for 2013 to 2015. However, the activity only meets the criteria for classification as an Opex project for Shell. Consequently, Opex budget offset will be sought at Corporate BCC meetings during the year to accommodate the 2012 budget while 2013 to 2015 budget requirements will be captured as Opex in BP12 and beyond.

Section 8: Group financial reporting impact

The financial impact of this proposal on Shell Group financial is as outlined in the table below:

US\$ Million	Prior Years	2012	2013	2014	2015	2016	Post 2016
Total Commitment	1.70	9.00	11.50	0.65	0.54		
Cash Flow							
Commitment/Pre-FID OPEX	1.70	9.00	11.50	0.65	0.54		
Capital Expenditure							
Operating Expenditure		0.27	1.23	(0.29)	(0.26)	(0.27)	(1.28)
Cash flow From Operations		(3.92)	(2.83)	3.36	(0.02)	0.19	0.12
Cash Surplus/(Deficit)		(3.92)	(2.83)	3.36	(0.02)	0.19	0.12
Profit and Loss							
NIBIAT +/-		(1.36)	(1.87)	(0.05)	(0.04)	0.04	0.19
Balance Sheet							
Avg Capital Employed		1.28	3.03	1.81	0.09		(0.01)

Section 9: Disclosure

Disclosures if any will be done in line with the Shell Group and SPDC Disclosure policies and guidelines.

Section 10: Financing

The base case assumption is that SPDC JV will fund the project. After the deployment of the Interdependency project, SPDC will also fund the operations and maintenance of the facility for the next 10years. The Project will be handed over to the SDCR – Community Infrastructure Projects (CIP) team. The first 2 years O&M is part of the EPICOM contract for the power plant facility. After 2years, CIP will set up an O&M contract for the next 8 years. During this period, CIP will aggressively pursue a robust exit strategy which will entail working closely with Community stakeholders to develop capacity to operate and maintain the facility. The consumers will be charged a stipulated tariff for power consumption, beyond a certain consumption threshold. The tariff system, operation and maintenance will be modelled after the ‘Bonny Utility Company structure. The pipeline will be handed over to SPDC Asset pipeline maintenance team

Section 11: Taxation

No unusual taxation feature.

Section 12: Key Parameters

This investment proposal seeks FID approval for \$23.4mln (Shell share) MOD, 50/50 (\$77.93mln 100% JV) for Nembe electric power interdependency project, this is inclusive of the previously approved pre-FID cost of US\$2.2 (shell share)

Section 13: Signatures

This Proposal is submitted to UIG for organisational approval

Supported By:

.....
Bernard Bos,
FUI/F
Date .../.../...

For shareholder approval:

.....
Ian Craig,
UIG
Date .../.../...

Initiator:

.....
Gbole-Wikina, Ema
UIG/T/PD
Date .../..../....

Appendix I

The table below shows economic indicators comparing the base case project (implementing gas driven engines and the alternative option of using the existing diesel powered generator solution upgraded to the same capacity from the project (7MVA) to power the 2 communities on a 24hrs basis. The analysis for both options covers power supply for 25years.

Economics results (Shell Share, RT11):

Case Name	Nembe Electrical Power 24hrs-7MVA (Diesel)	Nembe Electrical Power 24hrs-7MVA (Project)
NPV0% (\$mln)	-6.7	-2.8
NPV7% (\$mln)	-3.5	-2.7
VIR7%	NA	NA
RTEP	NA	NA
Tot OPEX (\$m)	44.5	19.1
Tot CAPEX excl Aband (\$m)	0.0	0.0

Economics Assumption:

All costs were treated as OPEX.
NDDC levy of 3% total expenditure